

**EFFECTIVENESS OF HEART SMART PACKAGE ON
KNOWLEDGE AND SKILL REGARDING PREVENTION
OF CORONARY ARTERY DISEASE AMONG AT RISK
CLIENTS ATTENDING CHRONIC OUTPATIENT
CLINICS AT SELECTED SETTING,
ANDHRA PRADESH**

**DISSERTATION SUBMITTED TO
THE TAMIL NADU Dr.M.G.R. MEDICAL UNIVERSITY,
CHENNAI.
IN PARTIAL FULFILLMENT OF REQUIREMENT FOR THE DEGREE
OF
MASTER OF SCIENCE IN NURSING**

APRIL 2016

Internal Examiner:

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ANDHRA PRADESH, 2015**

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LIST OF ABBREVIATIONS

ANOVA	-	Analysis Of Variance
BMI	-	Body Mass Index
BP	-	Blood Pressure
CAD	-	Coronary Artery Disease
CHD	-	Coronary Heart Disease
CHF	-	Congestive Heart Failure
CV	-	CardioVascular
CVD	-	CardioVascular Disease
DALYs	-	Disability Adjusted Life Years
DM	-	Diabetes Mellitus
ECG	-	ElectroCardioGram
HDL	-	High Density Lipoprotein
HSP	-	Heart Smart Package
HTN	-	Hypertension
IHD	-	Ischemic Heart Disease
KAP	-	Knowledge, Attitude and Practice
LDL	-	Low Density Lipoprotein
LMIC	-	Low and Middle-income Countries
LTPA	-	Leisure Time Physical Activity
MACE	-	Major Adverse Cardiovascular Events
MI	-	Myocardial Infarction
MVPA	-	Moderate-Vigorous Physical Activity
NCD	-	Non-communicable Disease
NPCDCS	-	National Programme for Prevention and Control of Cancer, Diabetes, CVDs and Stroke
OPA	-	Occupational Physical Activity
PA	-	Physical Activity
PVD	-	Peripheral Vascular Disease
PYLL	-	Productive Years of Life Lost
RR	-	Relative Risk
SB	-	Sedentary Behavior

SD	-	Standard Deviation
SES	-	Socio-Economic Status
SF	-	Saturated Fat
TC	-	Total Cholesterol
TV	-	TeleVision
US	-	United States
WC	-	Waist Circumference
WHO	-	World Health Organization
WHR	-	Waist Hip Ratio

LIST OF SYMBOLS

χ^2	-	Chi square
=	-	Equals To
<	-	Less than
>	-	More than
%	-	Percentage
+/-	-	Plus or minus

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“Effectiveness of Heart Smart Package on knowledge and skill regarding prevention of Coronary Artery Disease among at risk clients attending chronic outpatient departments at selected settings, Andhra Pradesh.”

ABSTRACT

Aim: To assess the effectiveness of Heart Smart Package on knowledge and skill regarding prevention of coronary artery disease among at risk clients attending chronic out patient clinic.

Methodology: A quasi experimental, pre and post test design was chosen for the study. Clients who fulfilled the inclusive criteria were selected as samples using non probability purposive sampling technique from the chronic op clinic of RUSH multi specialty hospital, Tirupathi, Andhra Pradesh, India. Heart Smart Package consists of lecture cum discussion, aided power point presentation and demonstration of heart healthy exercises and reinforcement through booklet regarding prevention of CAD. The post test level of knowledge and skill was assessed using structured interview schedule and observational check list scale respectively. **Results:** The findings of the study revealed that comparison of post test level of knowledge scores regarding prevention of CAD between experimental and control group, the calculated unpaired 't' value was 9.40 which denotes very high statistical significance at $p < 0.001$. With regard to comparison of post test level of knowledge and skill scores shows 9.40 in unpaired 't' value shows very high statistical significance at $p < 0.001$. The correlation between the post test level of knowledge with skill score was calculated using Karl Pearson correlation coefficient with 'r' value of 0.56 signifies moderate positive correlation. The significant level of association was identified between age, education, occupation and habit of smoking in the experimental group. **Conclusion:** Hence the Heart Smart Package developed by the investigator proved to be an effective aid in enhancing the knowledge and skill regarding prevention of CAD among at risk clients.

Key words: Heart smart package, knowledge and skill regarding prevention of CAD, CAD risk assessment, at risk clients

INTRODUCTION

Coronary Artery Disease (CAD) it is also known as ischemic heart disease. The heart, like all muscles, needs oxygen from the blood to function normally. The heart is supplied by its own blood vessels, the coronary arteries, but these can become clogged up in places with fatty deposits (atheroma) which narrow them, restricting the blood flow. These deposits may rupture, leading to clotting, blockage of the artery and acute myocardial infarction. The main conditions included in the category of Coronary Heart

Disease are acute myocardial infarction, angina pectoris, acute coronary syndrome and heart failure. Acute coronary events can be reduced by the early identification of risk factors and reduction of risk factors through healthy eating, regular exercises, management of co-morbid illness and maintaining optimum health, So that individuals at mild and moderate risk for future CAD can be manage their risk status and there by enable its prevention.

Objective

To assess the effectiveness of Heart Smart Package (HSP) on knowledge and skill regarding prevention of Coronary Artery Disease (CAD) among at risk clients attending out patient clinics at selected Hospitals, Andhra Pradesh .

Null Hypothesis

NH₁ - There is no significant relationship between the post test level of knowledge and skill regarding prevention of CAD in the experimental group

METHODOLOGY

A quasi experimental, non- equivalent, pre and post test control group design was used to conduct this study with the setting for the experimental and control group at RUSH Multispecialty Hospital. Totally 64 clients, who satisfied the inclusion criteria, were selected as samples for study using non-probability purposive sampling technique.

The risk of CAD was assessed by using Framingham Cardiovascular Risk Assessment Tool and pre test was conducted. The level of knowledge and skill was assessed by using structured interview schedule and observational check list respectively. The interventional tool HSP prepared by investigator , comprised of CAD risk factors and prevention of CAD administered to at risk clients in order to improve their knowledge and skill, and reinforcement through booklet after completion of pre test in experimental group as an aid for continued practice and for the control group after post test.

RESULTS

The present study aimed to assess the effectiveness of HSP on knowledge and skill regarding prevention of CAD among at risk clients attending chronic outpatient clinics .

The level of risk assessment among at risk clients using Framingham Cardiovascular Disease Risk Assessment Tool revealed that 23 (71.9%) had low risk, 9(28.1%) had moderate risk and 0(0%) had high risk of developing CAD in the experimental group and 24(75.0%) had low risk, 8(25.0%) had moderate risk and 0(0%) had high risk of developing CAD in control group.

The comparison of post test level of knowledge between the experimental group revealed that the post test mean score of knowledge was 20.03 with SD 3.05 and for the control group, post test mean score of knowledge was 10.63 with SD 1.79. The calculated unpaired 't' value of 9.40 showed high statistical significance at $p < 0.001$ level.

The correlation of post test level of knowledge and skill among the experimental group revealed that the mean score of knowledge was 20.03 with SD 3.05 and for the mean score of skill was 16.56 with SD 0.84. The calculated 'r' value of 0.56 showed moderate positive correlation and it had high statistical significance at $p < 0.001$ level.

With regard to association of selected demographic variables with the mean differed level of knowledge gain score regarding prevention of CAD in the experimental group ,age and education showed mild statistical significance and family history of CAD and habit of smoking showed high statistical significance. This indicates that clients aged between 51 – 60 yrs, those with middle school education, having family history of CAD and non- smokers showed higher improvement in their level of knowledge regarding prevention of CAD in comparison to the other samples.

With regard to association of selected demographic variables with post test level of skill in the experimental group, age and education showed mild statistical significance and family history of CAD and habit of smoking showed high statistical significance. This indicates that clients aged between 51 – 60 yrs, those with middle school education, having family history of CAD and non- smokers showed higher improvement in their post test level of skill regarding prevention of CAD in comparison to the other samples.

DISCUSSION

There was a significant improvement of knowledge and skill regarding prevention of CAD among at risk clients in the post test after administration of intervention package. Thus Heart Smart Package developed by investigator proved to be effective aid in improving the knowledge and skill regarding prevention of CAD.

CONCLUSION

The findings of this study conducted to assess the effectiveness of Heart Smart Package on knowledge and skill regarding prevention of CAD among at risk clients attending chronic outpatient departments, revealed that there is a significant difference in the post test level of knowledge and skill regarding prevention of CAD among at risk clients. This proved that the HSP was effective in enhancing knowledge and skill among at risk clients, there by empowering them to manage their risk status more efficiently.

IMPLICATIONS

Nurses plays an essential role in building the knowledge and skill on preventive aspects of CAD. The intervention is cost effective, and can easily can be incorporated by nurses in all hospitals or community health centers catering to at risk clients .The nurse educator can incorporate these findings in to the nursing curriculum there by promoting evidence based practice and develop skill among students in assessment of the existing risk factors of CAD. Health education regarding preventive measures to bring desirable change in lifestyle behavior can be made a vital component of chronic medical care of at risk clients and empowering clients to manage their risk status. The findings of the study can be disseminated through conferences, seminars and by publishing in journals.

INTRODUCTION

The Cardiovascular system or the circulatory system consists of three important vital components such as heart, blood vessels and lymphatics. This network brings life sustaining oxygen and nutrients to the body's cells, removes the metabolic waste products, and further carries hormones from one part of the body to another. The heart, like all muscles, needs oxygen from the blood to function and hence it is supplied by its

own blood vessels, the coronary arteries, but sometimes it can become clogged up in places with fatty deposits (atheroma) which narrow them, thereby restricting the blood flow. These deposits may rupture, leading to clotting, blockage of the artery and acute myocardial infarction. The main conditions included in the category of Coronary Artery Disease (CAD) were acute myocardial infarction, angina pectoris, acute coronary syndrome and heart failure.

Global Health Action Plan for Prevention and Control of Non-communicable diseases - **WHO 2013 -2020** reports that cardiovascular diseases, chronic respiratory diseases, diabetes, and cancers are the world's biggest killer diseases. Globally 36 million people die annually, of which 63% deaths arise from NCDs. More than 14 million individuals bite the dust between the ages of 30 and 70. The Low and Middle Income Countries (LMIC) as of now bear 86% of the weight of these unexpected losses, bringing about total monetary misfortunes of US \$ 7 trillion. Dr. Ala Alwan, Mac Lean MR., Leann MR., Edourd Tursan (2010) monitor the progress of non- communicable disease in high burden countries. The result determined that progress of NCDs was high in LIMC (Low and middle income countries. Tobacco use and obesity was found to be common in most of the countries. The Global Burden of Diseases (GBD), Injuries and Risk Factor Study (2010) evaluated that mortality because of NCDs has expanded from 57% of aggregate mortality in 1990 to 65% in 2010. More deaths around 80% identified with NCDs happen in LMIC, especially in middle aged individuals.

Cardiovascular Disease (CVD) accounts for the largest ratio of deaths related to NCDs than cancer, Chronic Obstructive disease (COPD) and Diabetes. The GBD 2010 calculated Disability-Adjusted Life Years (DALY's) which are the sum of years of life lost from premature death and years lived with disability and estimated DALYs to have increased to 54% worldwide in 2010 from 43% in 1990.

The projected cumulative economic loss from 2011 to 2025 all NCDs is \$7.28 trillion in LMIC. CVD accounts for nearly 50% of this projected loss. Within LMIC, it is projected that reducing CVD mortality by 10% would result in a \$377 billion reduction in economic losses from 2011 to 2025.

1.1 BACKGROUND OF THE STUDY

Global

Somebody endures a coronary occasion at regular intervals, and somebody passes on from one consistently in the USA. In Europe the death rate for CAD among men and women was between 1 in 5 and 1 in 7 that is 16% and 25% individually.

WHO 2012 expressed that CAD is the main source of death and is anticipated to remain so for the following 20 years every year, Approximately 3.8 million men and 3.4 million women kick the bucket from CAD. In 2020, it is assessed that this disease will be responsible of an aggregate of 11.1 million deaths internationally. Because of this expanding frequency over the world, CAD has been portrayed as a epidemic. American Heart Association recommends that the average age- adjusted incidence rates of CAD per 1,000 man years are 12.5 for white men, 10.6 for dark men and 4.0 for white women. By American Heart Association (AHA) insights, 770 000 Americans endured another coronary attack in 2008, and a further 430 000 encountered an intermittent attack. An extra 190 000 silent first heart attacks are assessed to occur every year. Studies propose that the average age- adjusted incidence rates of CAD per 1,000 man years were observed to be 12.5 for white men, 10.6 for dark men and 4.0 for white women.

Table1.1.1: Number of CHD deaths in different regions (% change in number of deaths from previous available total) South Asia comprises Afghanistan, Bangladesh, Bhutan, India, Nepal and Pakistan. East Asia comprises China, north Chorea and Taiwan.

	Region	1990	2010	Percentage Change
1	Asia			
	East Asia	47,158	992,163	+110.1%
	South Asia	704,833	1,323,551	+87.8%
	South East Asia	215,719	383,323	+77.7%
	Asia Pacific, High income.	113,347	166,853	+47.2%
	Central Asia	138,157	184,167	+33.3%
	Australia	42.128	37.738	-10.4%
2	Europe			
	Eastern Europe	834,783	1.115,213	+33.6%
	Central Europe	331,497	344,139	+3.8%

3	Africa			
	North Africa and Middle East	263,978	418,019	+58.4%
	Sub-Saharan Africa	144,713	217,397	+50.2%
4	America			
	South America	275,187	422,584	+53.6%
	North America, high income	703,057	619,377	-119%

[Source: Global Cardiology Science and Practice Published (Jan 29, 2014)]

The Global Status Report on impact of risk factors on cardiovascular system (2014) by WHO expressed that NCDs as of now cause a larger number of passings than every single different caus joined and NCDs passings are anticipated to increment from 38 million in 2012 to 15 million by 2030.

Roughly 42% of all NCDs deaths internationally happened before the age of 70 years. 48% of NCDs deaths in LMIC and 28% in high salary nations were in people matured under 70 years.

Alcohol

WHO expressed that liquor had a causal relationship between its destructive use and the morbidity and mortality connected with cardiovascular disease. In 2012 an expected 3.3 million deaths or 5.9% of all deaths worldwide were ascribed to alcohol utilization and more than half of these deaths from NCDs.

Physical activity

The WHO prescribed consistent physical activity no less than 150 min of moderate power physical activity/week for adults, lessens the danger of CAD and DM. Youngsters and youthful matured between 5–17 years ought to aggregate no less than 60min of physical movement of moderate to vigorous intensity every day, keeping in mind the end goal to keep up and enhance lung and heart condition

Globally 2010, 25% of adults men and 27% of adult women did not meet WHO suggestion on physical action for wellbeing. Amongst young people matured between 11 – 17 years, 78% of young men and 84% of young women did not meet these proposal

Salt consumption

Globally in 2010, 1.7 million yearly deaths from cardiovascular cause have been ascribed to abundance salt/sodium consumption. High salt utilization adds to raised circulatory strain and expands the danger of coronary illness. The present assessments recommend that the worldwide mean intake of salt is around 10g of salt day by day. WHO prescribes diminishing salt utilization to <5g (1 teaspoon) every day in adults to avoid hypertension and coronary illness.

Tobacco use remains the reason for 6 million preventable deaths for each year all around.

Blood pressure

Raised circulatory strain is one of the main danger components for worldwide mortality and is evaluated to have brought on 9.4 million deaths and 7% of disease burden – as measured in disability- adjusted life years – in 2010. The worldwide predominance of high BP in adults matured 18 years and over was around 22% in 2014. Diminishing the rate of hypertension through usage of populace wide approaches to decrease behavioral risk variables, including destructive utilization of alcohol, physical activity, overweight, corpulence and high salt admission, is key to achieving this goal.

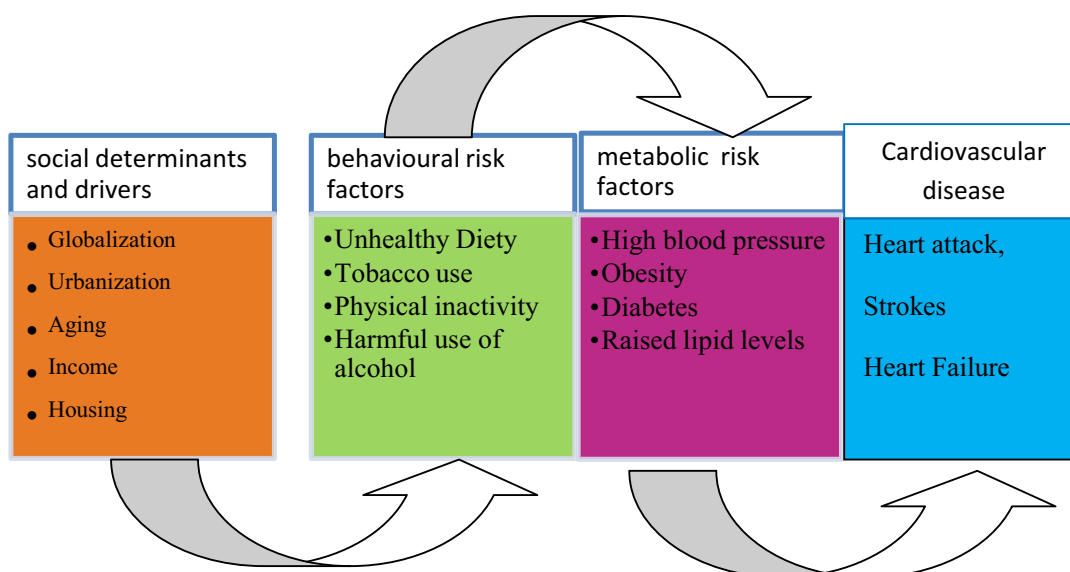


Figure 1.1.1: Main contributory factors for CVD and its complications

Obesity

In 2014, 39% of adults matured 18 years and older (38% of men and 40% of women) were overweight. The overall pervasiveness of obesity almost multiplied somewhere around 1980 and 2014. In 2014, 11% of men and 15% of women worldwide were obese. Along these lines, more than a large portion of a billion adults worldwide are classed as obese. So the WHO executed the National Multisectorial Action Plans and strategies to prevent the coronary illness complexities.

India

India experiences amongst the highest number of potentially productive life years lost due to CVD, expected to reach 117.9 million years by 2030. The WHO (2005) estimated that India lost 8.7 billion US dollars in national income due to combined mortality from CHD, stroke and diabetes.

Rajeev Gupta, Soneil Guptha, Krishna Kumar Sharma, Aravind Guptha and Prakash Deedwania (2012) conducted a prospective study on regional variations of CAD risk factors in India. The individual researchers had reported that there are large regional variations of risk factors in India.

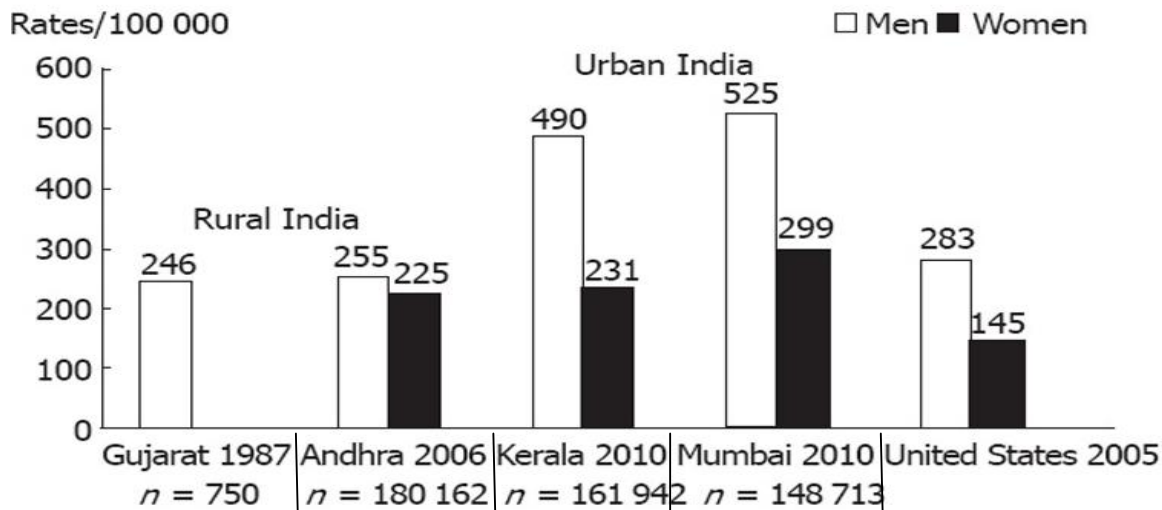


Figure 1.1.2 Prospective studies of cardiovascular mortality in urban and rural Indian populations and the United States of America.

[Source: World Journal of Cardiology, (2012)]

Nathan.D Wong (2014) reported numerous longitudinal epidemiological studies demonstrating that CHD as the fundamental driver for CVD. The prevalence and incidence of critical risk factors changes as indicated by gender, ethnic foundation, and topographical district. CVD involved mainly of CHD (counting stable and unstable angina, nonfatal MI, and coronary death), heart failure, ventricular arrhythmias and sudden cardiovascular deaths, rheumatic coronary illness, transient ischemic attack, ischemic stroke, subarachnoid and intracerebral haemorrhage, abdominal aortic aneurysm, peripheral artery disease, and congenital coronary illness. Ischemic coronary illness, which comprises essentially of CHD, is the overwhelming sign of CVD, and causes 46% of cardiovascular deaths in men and 38% in women. Cerebrovascular Disease is the type of CVD with the second-most astounding mortality-34% of cardiovascular deaths in men and 37% in women. Despite the fact that the weight of CHD was highest in western nations amid a significant part of the twentieth century, the greatest weight of CHD now happens specifically in Asian and Middle-Eastern area.

Shraddha and Bani, (2013) reported that more than 80% of deaths and 85% of incapacity from CVD happen in LMIC. Among these, CVD influences Indians with more prominent recurrence and at a more youthful age than their counterparts in developed countries, as well as many other developing countries. In addition to high

rates of mortality, CVD shows here very nearly 10 years prior on an average than different nations on the world, bringing about significant number of deaths in working age group. In western nations where CVD is thought to be a sickness of the matured 23% of CVD deaths happen underneath 70 years old while in India 52% of CVD deaths happen below 70 years old. Along these lines, India endures a huge loss of productivity because of expanded pervasiveness of Coronary Heart Disease (CHD). The aggregate years of life lost because of aggregate CVD among the Indian men and women matured 35-64 has been assessed to be higher than comparable nations, for example, Brazil and China. These appraisals are anticipated to increment by 2030, when contrasts might be much more checked.

Table 1.1.2: The complete years of life lost due to total CAD

Country	2000		2030	
	Complete years of life lost	Rate per 100,000	Complete years of life lost	Rate per 100,000
India	9,221,165	3,572	17,937,070	3,070
Brazil	1,060,840	2,121	1,741,620	1,957
China	6,666,990	1,595	10,460,030	1,863

[Source: International Journal of Scientific and Research Publications, (2013)]

Sekharia et al, (2014) reported findings regarding prevalence of risk factors among government employees across Indian urban population

Table 1.1.3: Percentage of risk factors for CAD based on gender.

S.No.	Parameters	Men	Women
1	Family history of CAD	4.6%	6%
2	Smoking	11.6%	13.8%
3	BMI >25 kg/m ²	47.6%	46.1%
4	BMI 25 – 30 kg/m ²	39.4%	38.6%
5	BMI >30 kg/m ²	8.2%	6.6%
6	Diabetes mellitus	16.6%	12.7%
7	Hypertension	22.4%	13.4%
8	Dyslipidemia	48.27%	31.4%

[Source: British Medical Journal, (2014)]

Similarly Nageswara Rao C.H.V., et al (2015) conducted a study on assessment of cardio-metabolic risk profile in different age groups of subjects with coronary artery disease. Results showed significant association between age (p=0.018), smoking

($p < 0.0001$), hypertension ($p < 0.001$), diabetes ($p < 0.001$), high LDL ($p < 0.0001$) and CAD. Physical activity ($p < 0.0001$) and High HDL ($p < 0.001$) were found to be protective for CAD. Lastly they concluded that the risk factors concept implies that a person with one risk factor is more likely to develop atherosclerosis event and more likely to do so earlier than a person with no risk factor. Presence of multiple risk factors in patients further accelerates the incidence of atherosclerosis. Similarly Abhishek Singh., et al (June 2014) conducted a cross sectional study to assess the prevalence of coronary risk factors among population aged 35 years and above from rural Maharashtra. The results revealed that

Table 1.1.4: Prevalence of risk factors for CAD

S.No.	Risk factor	Results
1	Tobacco consumption	51.83%
2	Physical inactivity	31.61%
3	High diastolic pressure	29.41%
4	Obesity and Alcohol consumption	13.97%
5	Hypertriglyceridemia	22.05%
6	Fasting blood glucose	15.44%

[Source: Journal of Krishna Institute of Medical Sciences University (JKIMSU) , vol.3, 1, Jan-June- (2014)]

Rama Walia et al., (2014) assessed the prevalence of CVD risk factors via a cross sectional study, the findings are shown below

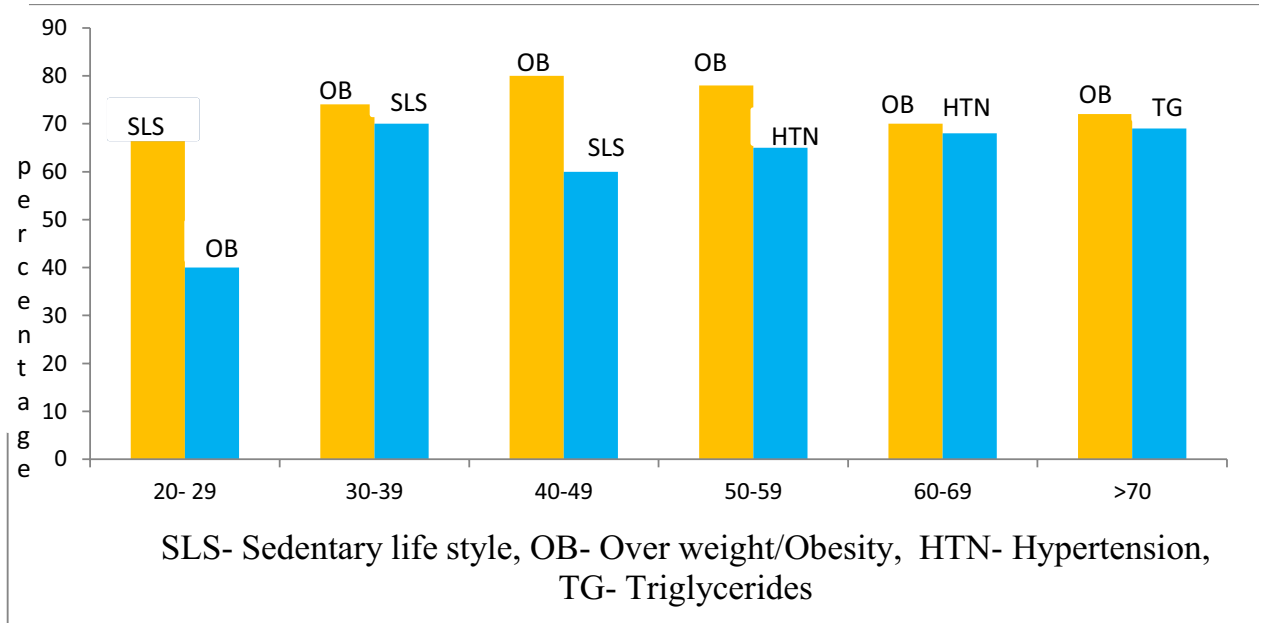


Figure 1.1.3: High prevalence of two most common CV risk factors in different decades of life

[Source: Indian Journal of Medical Research, (2014)]

Tanmay Nag, Arnab Ghosh (2014) found that CVD risk factors was higher in males than in females

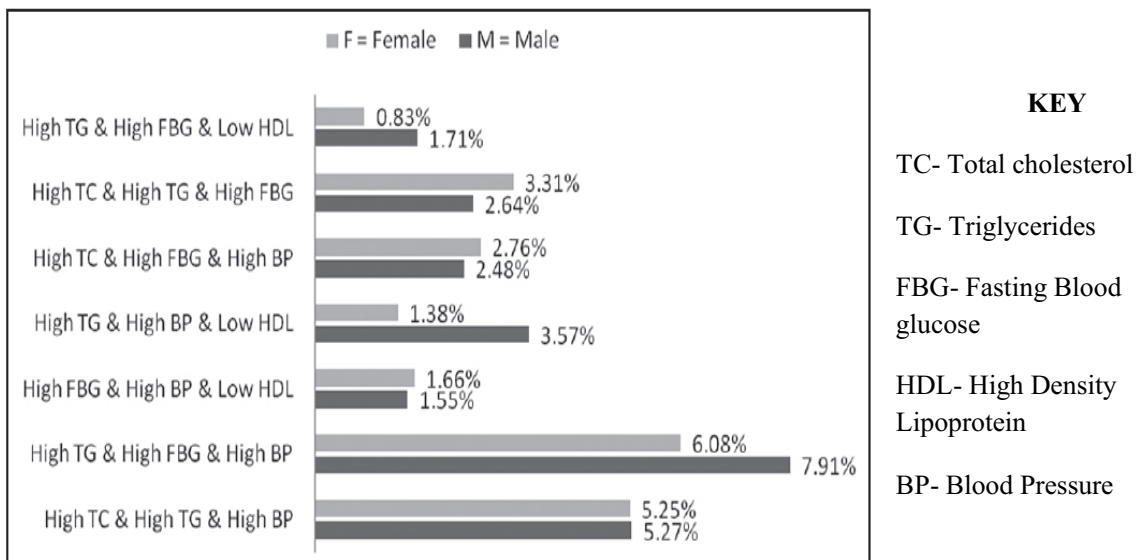


Figure 1.1.4: Cluster of risk factors shown according to gender.

[Source: International Journal of Medicine and Public Health 2015)

Researchers Srinivasa Jayachandra et al., (November 2015), Latheef. SA, and Subramanvam.G (2007) conducted separate studies on risk factor profile for coronary artery disease among young and elderly patients in Andhra Pradesh. Results revealed that

hypertension (20%), Smoking (22%), Diabetes mellitus (11%) and dyslipidemia (8%), were the most common risk factors in young patients. With reference to elderly patients, the diabetes mellitus (21%), smoking (17%), kidney disease (11%) and dyslipidemia (9%) were the most common risk factors.

1.3 SIGNIFICANCE AND NEED FOR THE STUDY

Today, the average age persons suffering with heart diseases has come down drastically. This is mainly due to result of changing lifestyles pattern. In fact the rate of INTERHEART CAD in the Indian community particularly in young man is almost twice as high as their western counter parts. There are numerous reasons or factors which have resulted in an increase in the number of heart patients in India, the most common being modern life style proved to be the stimulus for the growth of heart disease among the young population. Improper food habits and lack of physical activity coupled with high level of stress and increase in smoking and alcohol consumption are also some of the contributing factors.

Researchers Vamadevan. S, Ajay and Dorairaj Prabhakaran (2010) in the study showed comparison of impact of population based CHD interventions between developed and developing countries. With increasing incidence of CAD, interventions likely to be effective as opposed to developed countries where interventions carried when decline secular trends were observed

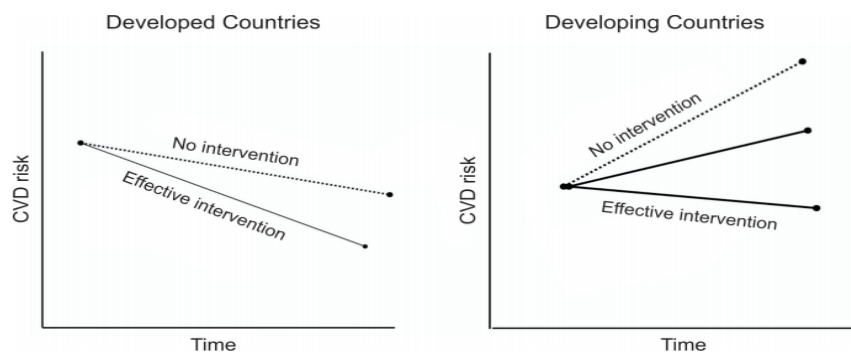


Figure 1.1.5: Comparison of population based CHD intervention on CVD risk factors between developed and developing countries.

[Source: American Heart Association, (2010)]

According to the **Centre for Disease Control and Prevention, 2015**

- Heart disease is the leading cause of death for both men and women, 1 in every 4 deaths are due to heart disease and second cancer.

- Annually more than 370,000 people killing due to CHD.
- Every 43 sec in USA someone has a heart attack, each minute someone dies form a heart disease related event and second cancer
- The cost of health care services, medications and lost productivity for CHD US 108.9billion each year

The Indian Heart Watch (IHW) (19.02.2012) reported the “Reasons for India’s growing cardiovascular disease epidemic pinpointed in largest –ever risk factor study”. This study was presented for the first time at the World Congress of Cardiology organized by the World Heart Federation. The study assessed the prevalence of different “lifestyles” and biological CVD risk factors across the country and results revealed that these risk factors are now at higher levels in India than in the developed countries. 79% of men and 83% of women were found to be physically inactive, while 51% of men and 48% of women were found to have high fat diets. Some 60% of men and 57% women were found to have a low intake of fruits and vegetables, while 12 % of men and 0.5% of women had smoking habit. **Prof. Prakash Deedwania**, University of California, San Francisco said *“India has the questionable refinement of being known as the "coronary and diabetes capital of the world,"*

WHO Global Action Plan Expected Outcome 2013-2020 recommended converging the health care services and resources by collaborating with the Nongovernmental organization to render the comprehensive health care services and thus reduce the burden of chronic disease like hypertension, diabetes mellitus, cardiovascular disease, and kidney diseases etc..

With regard to the risk factors for CAD some of the researchers reported as fallows, Abhishek Singh et .al., (2014) conducted a cross sectional study to assess the prevalence of coronary risk factor in rural Maharashtra, India. The results revealed that tobacco consumption was found to be prevalent in 51.83% of the study subjects followed by physical inactivity which was prevalent among 31.61% where as high diastolic blood pressure was found to be prevalent in 29.41% of the study subjects. Obesity and alcohol consumption were found to be prevalent among 13.97% of the study subjects. Among biochemical parameters hypertriglyceridemia was found to be prevalent in 22.05% fallowed by raised fasting blood sugar in 15.44% of the study subjects.

Aniket Arole, (2013) conducted a quantitative study to assess the effectiveness of planned teaching programme on knowledge regarding prevention of CAD amongst 60 DM patients. They found that planned health teaching program improved the knowledge regarding prevention of CAD. Similarly Cyril James (2013) conducted a cross sectional study on risk factors for CAD among patients with Ischemic Heart Disease in Kerala. Results showed that among south Indians of gender, diabetes mellitus and dyslipidemia are the real risk factors for CAD. So early recognition of diabetes mellitus and dyslipidemia and appropriate treatment of both, before adding to the end organ harm, play a fundamental part for the prevention of CAD.

Emily Williams D, James Nazroo N, Jaspal Kooner S, and Andrew Steptoe (2010) conducted a cross sectional study to explore the differences in psychosocial risk factors related to CHD. Findings revealed that 50.5% are Sikh, 28.0% Hindu, and 15.8% are Muslim. Muslim participants were more socioeconomically deprived and experienced higher levels of chronic stress, Muslim men smoked more, reported lower alcohol consumption and did less physical activity than other groups.

Elizebeth Baby and Sams Larissa Martha (2015) conducted a descriptive survey to determine the knowledge regarding CAD. Findings revealed that there was a significant relationship between knowledge and age, occupation and education but no significant relationship between knowledge and religion. The study concluded that patients have moderate level of knowledge regarding CAD.

Harari G, Green M S and Zelber-Sagi S (2015) conducted a prospective cohort study to determine CV Occupational Risk Factors, data on self reported Occupational Physical Activity (OPA) and Leisure Time Physical Activity (LTPA) and on CHD mortality were obtained from the National Death Registry. The study concluded that Moderate-hard OPA may be deleterious to health and should not be a substitute to LTPA.

Gupta. R, Sharma. K.K, Gupta. A, Agarwal. A, Mohan, Gupta V.P (2012) studied regarding the persistence of high prevalence of CVD risk factors in urban middle class in India and stated that there is a high prevalence of multiple CVD risk factors in India

more in middle class individuals. Jarett Berry D et.al, (2012) conducted a meta-analysis to assess the life time risks of CVD using data from 18 cohort studies involving a total of 257,384 black men and women and white men and women whose risk factors for CVD. They observed that among participants who were 55 years of age, with an optimal risk-factor profile had substantially lower risks of death from CVD through the age of 80 years than participants with two or more major risk factors. Sarwar N et. al, (2010) undertook a meta-analysis of 102 prospective studies to quantify the association of DM and fasting glucose concentration with risk of CHD. The study concluded that DM confers about a two-fold excess risk for a wide range of vascular diseases, independently from other conventional risk factors. Trushna Shah et.al, (2015) conducted a cross sectional study on prevalence of CHD in different socio economic status in Gujarat, India. The report concluded that higher social classes with dyslipidemia may have greater CHD risk than lower social classes. This may be due to their sedentary lifestyle diet modification and that less physical activity may play a key role.

Imes C C, Lewis F M, Austin M A, Dougherty C M (2014) conducted a single group pre and post test to evaluate the viability of a behaviorally engaged intercession intended to increased perceived CVD and CHD risk in youthful adults in Pittsburg, Pennsylvania. Intervention included tailored messages about 10-year and lifetime CHD risk based on risk factors and brief counseling on healthy lifestyle to decrease risk. Findings revealed that intervention was effective and participants requested more information on healthy food choices and which exercises most improve CV health.

Based on the findings of the above mentioned studies, the investigator perceived that there is an alarming rise of CAD risk factors among young people when compared to elderly due to urbanization, sedentary life style changes, smoking, alcohol, systolic hypertension, elevated triglycerides, High LDL, low HDL and stress. In spite of the widespread efforts in creating awareness, at risk patients in semi urban and rural areas still remain unaware of the consequences of high levels of CAD related risk. Hence the research investigator felt that there is an urgent need to initiate measure to raise awareness of these risk factors. So that individuals at mild and moderate risk for future CAD can be manage their risk status and there by enable its prevention.

1.3 STATEMENT OF THE PROBLEM

A quasi experimental study to assess the effectiveness of Heart Smart Package on knowledge and skill regarding prevention of Coronary Artery Disease among at risk clients attending chronic outpatient clinics in selected hospitals, Andhra Pradesh.

1.4 OBJECTIVES

1. To assess the existing level of risk for CAD among the experimental and control group.
2. To assess effectiveness of Heart Smart Package (HSP) on the level of knowledge regarding prevention of CAD among at risk clients.
3. To assess the post test level of skill regarding prevention of CAD in the experimental group
4. To correlate the post test level of knowledge with skill regarding prevention of CAD in the experimental group.
5. To associate the selected demographic variables with the mean differed knowledge and post test skill score regarding prevention of CAD in the experimental group.

1.5 OPERATIONAL DEFINITION

1.5.1 Effectiveness

It refers to the outcome of Heart Smart Package on knowledge and skill regarding prevention of CAD, assessed using a structured interview schedule and observational checklist respectively.

1.5.2 Heart Smart Package (HSP)

It refers to cardiac health focused information and strategies prepared by the investigator and aimed at empowering individuals prone for CAD to manage their at risk status . It comprises:

- A) Lecture cum discussion aided by power point presentation for 5-7 members for about 30 min duration on,
 - General information- Meaning of CAD, risk factors, causes, warning signs, and complications of CAD

- Strategies for risk reduction- Healthy diet, regular exercises, cessation of smoking and alcohol, management of co-morbid illness and monitoring optimum health.
- B) Demonstration of cardio exercises by the investigator on warm-up, twist crunch, squat and over head press, static lunge, deep breathing exercises and cool down exercises to be performed for 3 min each, for a total duration of 20 min, once daily.
- C) Re-demonstration of the cardio exercises by at risk clients.
- D) Re-reinforcement of prevention of CAD through booklet

1.5.3 Knowledge regarding prevention of CAD

It refers to the extent of awareness at risk clients regarding risk for CAD and measures to control it by using structured interview schedule devised by the investigator.

1.5.4 Skill regarding prevention of CAD

It refers to the ability of the at risk clients to perform the cardio exercises aimed at controlling risk for CAD, assessed using observational check list

1.5.5 At risk clients

It refers to the individuals with low or moderate risk for CAD, identified by using Framingham Cardiovascular Disease Risk Assessment Tool which consists of risk factors pertaining to age, total cholesterol, HDL, smokers, non-smokers and systolic blood pressure, who attend the Chronic Out Patient Clinic.

1.6 ASSUMPTIONS

1. At risk clients may have some knowledge regarding risk for cardiovascular disease.
2. Educating at risk clients about Heart Smart Package may enhance their knowledge and skill regarding cardiovascular health promotion

1.7 NULL HYPOTHESES

NH₁-There is no significant effect of Heart Smart Package on the level of knowledge regarding prevention of CAD among at risk clients. at $P < 0.05$ level of significance.

NH₂-There is no significant relationship between the post test level of knowledge and skill regarding prevention of CAD in the experimental group at $P < 0.05$ level of significance

NH₃-There is no significant association of selected demographic variables with the mean differed level of knowledge and post test skill regarding prevention of CAD in the experimental group at $P < 0.005$ level of significance.

1.8 DELIMITATIONS

The study is delimited to a period of four weeks.

1.9 CONCEPTUAL FRAMEWORK

A conceptual framework or model is the concepts of mental images of the phenomenon. These concepts are linked together to express the relationship between them. The conceptual framework provides the investigator the guidelines to proceed in attaining the objectives of the study. Conceptual framework adopted is based on integrated **Wiedenbach's Helping Art of Clinical Nursing Theory** and **J.W.Kenny's Open System Model**. Wiedenbachs Helping Art of Clinical Nursing Theory was given by **Ernestine Wiedenbach**. She views this theory as a set of interrelated concepts that gives systematic view of a phenomenon that is explanatory and predictive in nature. The present study is aimed at helping the at risk clients to develop adequate knowledge and skill regarding prevention of CAD.

In 1968, **Ludwig Bertalanffy** developed a general system model approach, which was modified and put into practice as the open system model by J.W. Kenny in 1999. The open system model enumerates various aspects of system and interaction. The open system continuously interacts with environment. The interaction takes form of information transfer into or out of the system boundary, depending on the discipline which defines the concept. Open system model is useful in breaking the whole process into sequential tasks to ensure goal realization. The three major aspects of the system are:

1. Input
2. Throughput
3. Output

The investigator applied J.W. Kenny's open system model in order to assess the knowledge and skill of CAD.

The concepts according to the study:

Input: Identifying the need for help According to J.W. Kenny, input is a type of information or material that enters the systems from the environment through its boundaries. In this study it refers to the demographic variables of participants such as age, gender, occupation, educational qualification, marital status, type of family, family monthly income, religion, family history of CAD, nature of relationship, history of co-morbid illness and habit of smoking. Biological variables such as height, weight, BMI and fasting blood sugar. These are assessed by using a structured interview schedule. According to Ernestine Weidenbach, identifying the need for help, the nurse perceives the patient as an individual with unique experiences and understanding the patient's perception of the condition and determines patient's need for help based on the existence of a need, whether the patient realizes the need, what prevents the patients from meeting the need and whether the patient cannot meet the need alone. In identifying the need there are two components:

1. General information

This comprises collecting the information to identify the need. In this study the investigator assessed the general information which includes family history of CAD, nature of relationship with affected member, co-morbid illness, Body Mass Index (BMI), habit of smoking, assessment of existing level of risk of developing CAD.

2. Central purpose

The central purpose refers to what the investigator wants to accomplish. In this study it refers to the assessment of effectiveness of Heart Smart Package on knowledge and skill regarding prevention of CAD among at risk clients attending outpatient clinics.

Throughput: Ministering the Need for Help

Throughput is the process that occurs at some point between input and output process. In this study throughput refers to transformation of information in form of Heart Smart Package. In ministering the need for help, the nurse investigator formulates a plan for meeting the at risk client need for help based on available resources, the components are:

a) Prescription

It refers to the plan of care the nature of action that will fulfil the central purpose. In this study the investigator planned and prepared the Heart Smart Package regarding prevention of CAD. In experimental group it will be given on the first day after the pre test and in the control group on the last day after post test.

b) Ministering

It refers to the information transfer given by the investigator to the at risk clients. In this study the investigator administered the Heart Smart Package regarding prevention of CAD which includes information transfer in the form of lecture cum discussion with the aid of a power point presentation, demonstration of heart healthy, re-demonstration by clients and reinforcement on prevention of CAD through a booklet.

c) Realities

The realities are the immediate situation that influences the fulfillment of the central purpose. The nurse investigator should consider the realities of the situation in which she has to provide care. Wiedenbach defines the realities as:

1. Agent

The agent is the participating nurse who has the personal attributes, capabilities, commitment and competence to provide nursing care. In this study the agent is the nurse investigator.

2. Recipient

The recipient is the patient who has personal attributes, problems, capabilities, aspirations and ability to cope. In the study the recipient are the at risk clients for developing CAD.

3. The goal

The goal is the nurse's desired outcome, it directs action and suggests the reason for taking those actions. In this study goal is to provide insight regarding CAD and thereby prevent at risk clients from developing CAD.

4. Means

The means are the activities and devices used by the nurse to achieve the goal. In this study, the means is the Heart Smart Package regarding prevention of CAD which includes information transfer in the form of lecture cum discussion with the aid of a power point presentation, demonstration of heart healthy exercises, re demonstration by at risk clients and re-enforcement on prevention of CAD through a booklet.

5. Framework

Framework refers to the facilities in which nursing is practiced, it comprises of human, professional and organizational aspects of care. In this study, the framework refers to the chronic out patients department in RUSH Multispecialty Hospital.

Output: Validating the needed help was met

Output is the expected outcome of the input by the process of throughput. It is validating if the needed help was met through the delivered action to achieve the central purpose. In this study it refers to change in post test assessment of level of knowledge and skill regarding prevention of CAD.

1. Enhancement

In this study the achievement of goal or need was indicated by positive outcome that is attainment of adequate or moderately adequate knowledge and skill which is enhanced by continuity of practice.

2. Reassessment

Negative outcome is indicated by inadequate knowledge and skill regarding prevention of CVD. Reassessment and reinforcement is given to such clients. By integrating Wiedenbach's Helping Art Of Clinical Nursing Theory and J.W.Kenny's Open System Model the investigator was able to incorporate more concepts in the study, this helped the accomplishment of the study in an organized manner.

Conclusion:

To conclude the particular theory enhance the investigator to lead a conceptual pathway towards the study, by identifying the CAD risk clients, and for prescribing and administering HSP. Thereby it provoked the knowledge and skill regarding prevention of CAD.

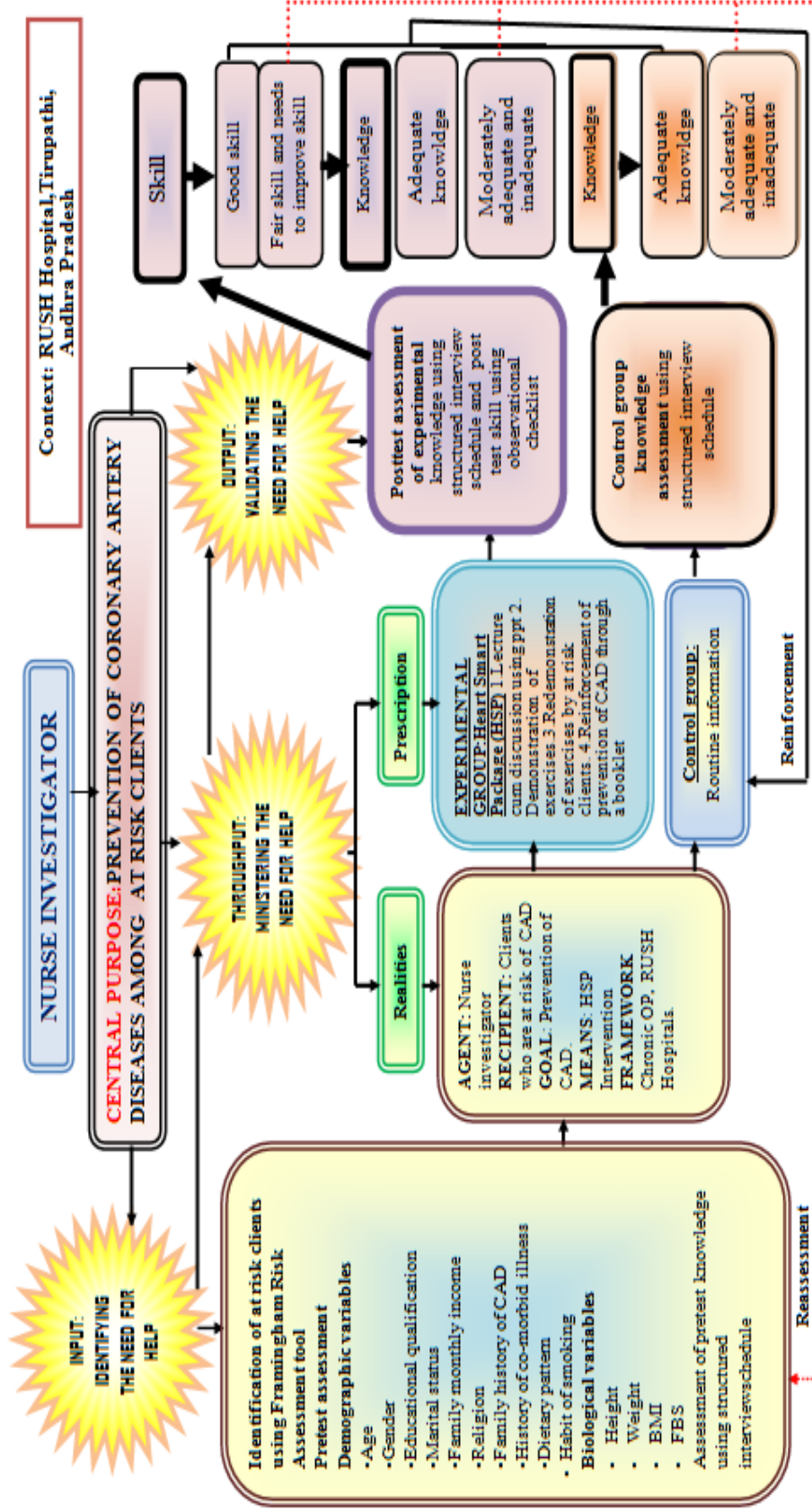


Fig.1.9.1: CONCEPTUAL FRAMEWORK BASED ON INTEGRATED WIEDENBACH'S HELPING ART OF CLINICAL NURSING THEORY AND J.W.KENNY'S OPEN SYSTEM MODEL

REVIEW OF LITERATURE

This chapter focuses on the preparation of review as a component of an original study.

Literature review refers to a “critical summary of research on a topic of interest, often prepared to put a research problem in context” (Polit and Beck, 2012). To be more specific, critical review is meant as summarization and evaluation of the ideas and information of an article.

Some important purposes of literature review is to

- alert the researcher to unresolved research problems
- identify a study for replication or comparison
- define ethical implications of similar studies
- provide a conceptual context and information on the research approach
- orient to what is already known
- determine how well the theory and research are developed in the study
- bring the research problem into sharper focus

The design used in this study was quasi experimental, non-equivalent control group pre test and post test design to find the effectiveness of Heart Smart Package on knowledge and skill regarding prevention of Coronary Artery Disease among at risk clients attending chronic outpatient departments.

SECTION 2.2: SOURCES OF REVIEW OF LITERATURE

The literature review was collected from various sources such a **primary**: from research reports, conference manual and theses, **secondary**: reviews from internet, national and international journal articles and the **tertiary sources** from Medical Surgical Nursing and Community Health Nursing books.

This review of literature was done using the key words such as CAD and its risk factors prevalence, incidence, mortality, morbidity, contributing factors, , prevention, complications, and cardio heart healthy exercises. This review was gathered from

standard databases such as COCHRANE library, CINHALL, Google Scholar, MEDLINE, PubMed, and other unpublished studies from dissertations. Collectively 200 studies were searched out of which 75 relevant and updated studies were utilized to support the current research topic. Among the selected supportive studies, were international and Indian literatures.

SECTION 2.3 : ORGANIZATION OF REVIEW OF LITERATURE

Section 2.3.1 : Critical reviews related to prevalence of CAD and its risk factors

Section 2.3.2 : Critical reviews related to general awareness regarding risk factors for CAD

Section 2.3.3 : Critical reviews related to strategies for control of CAD risk factors

SECTION 2.3.1: CRITICAL REVIEWS RELATED TO PREVALENCE OF CAD AND ITS RISK FACTORS

Chiuvè SE, McCullough ML, Sacks FM, Rimm EB. (2010) conducted a cohort study on healthy of life elements in the prevention of coronary illness among US male health professionals aged 40-75 years. The researcher ascertained the population inferable risk of low risk lifestyle variables utilizing Cox corresponding hazard model to assess relative danger of CHD. Results found that more than 16 years of screening, there were 2,183 cases of CHD. Men with 5 low risk of lifestyle components were at diminished danger for episode CHD, contrasted with men who did not make way of lifestyle switching follow-up, Those who received ≥ 2 extra lifestyle factors had a 95% generally safe of CHD and the researcher concluded that adherence to sound way of lifestyle habits might prevent a dominant part of CHD occasions among US healthy men.

A series of researches by Azza Greiw H., Ahmed Mandil, Mervat Wagdi, Ali Elneihoum (2010), Al-Nooh A A., Abdulabbas Abdulla Alajmi A and Wood D (2014)., Vaccarino V., Borgatta A., Gallus G., Sirturi CR (2010) and De Fatima M, Nelson AS., Armondo JM.(2010) reported on the prevalence of risk factors among adult population. 1381 (46%) were females and 1619 (54%) males, lack of exercise (67.3%), cholesterol >200 mg/dl (56.6%), overweight (42.1%), obesity (17.0%), hypertension (18.2%), smoking (12.4%), and diabetes mellitus (2.5%), 24.3% were not eating daily servings of fruits and vegetables, 16.1% were current smokers, 95.35% had either no or <3 CVD risk factors and 4.65% had 3-5 risk factors. They concluded that adult population is at high

level risk of CAD and hence an urgent decision to address the nation for the control measures of CAD is required.

In a descriptive study Bhattacharya P., Marimuthu P., Chowdhari RN., Sarkar AK., Adak SK., Banarji KK., (2011) reported that the above mentioned risk factors are responsible for developing 64% of myocardial infarction in the age group of 30 – 40 years. With regard to gender, Sharma. R et.al, (2011) reported that there was a critical pervasiveness of risk factors for both men and women separately as to smoking or tobacco use in 209(37.6%) and 12(2.2%), obese in 303(54.5%) and 350(61.3%), hypertension in 322(57.9%) and 279(48.9%), diabetes in 88(25.9%) and 64(21.1%) and low HDL cholesterol 103(30.3%) and 83(27.3%) subjects. The study concluded that there is a critical pervasiveness of numerous cardiovascular danger components in this population group. In the mortality and morbidity weekly report with regard to age Sara E, Luckhaupt MD, Geoffrey M, Clavert MD (2014) observed higher prevalence of CHD in the age between 40 – 50 years in United States. Jarett Berry D et. al,(2012) conducted a meta-analysis to evaluate the life time dangers of CVD utilizing information from 18 associate studies including a sum of 257,384 dark men and women and white men and women whose risk factors for CVD were measured at the ages of 45, 55, 65, and 75 years. BP, cholesterol level, smoking and DM status were utilized to stratify members as per risk factors. They observed that among members who were 55 years old, with an ideal risk factor profile had considerably bring down risk of death from CVD through the age of 80 years than members with two or more major risk factors.

With regard to socioeconomic status Rajeev Gupta et al (2012) conducted a country wide mortality statistics and morbidity survey to evaluate risk factors in middle socioeconomic subjects in India by stratified random sampling using house-to-house survey. The author demonstrated that there is a high prevalence of multiple CV risk factors in Indian middle class individuals, Trushna Shah, Geetanjali Purohit, Shah RM. and Harsoda JM. (2015) reported that LDL, TC and BMI significantly is high in upper class people. The study that higher social class people had high risk of CHD than lower social class people due their sedentary lifestyle changes, dietary pattern and physical inactivity which may play a key role in the development of CHD.

A series of prospective and meta analysis, including cohort studies done by the Anders Grontved, Frank B (2011); and Earl Ford S and Carl Casperson J (2012) determined the associations between screen time and sitting time for fatal and non-fatal CVD. Findings revealed that greater sedentary time (TV viewing) is associated with an increased risk of fatal and non-fatal CVD. It was concluded that this may better shape future guideline development as well as clinical and public health interventions to cut down the measure of sedentary behavior in advanced societies.

Eva-Maria Backe., Andreas Seidler., Ute Latza., Karin Rossnagel and Barbara Schumann (2011). conducted a systematic review to proof for relationship between various models of anxiety at work, and CV morbidity and mortality among industry laborers, 26 publications were incorporated, depicting 40 investigations out of 20 cohorts. The risk evaluations for work anxiety were connected with a statistically significant expanded risk of CVD in 13 out of the 20 cohorts. Glozier N., Tofler GH., Colquhoun DM (2013) reported that work related stress and work movements may have direct physiological impact on cardiovascular influencing so as to wellbeing and aberrant impact behavioral factors such as obesity and smoking. The study concluded that other than individual measures to oversee stress and to adapt to requesting work circumstances, hierarchical changes at the working environment should be considered to discover alternatives to reduce the occupational risk factors for CVD.

Rod Taylor S, Kate Ashton E, Tiffany Moxham, Lee Hooper and Shah Ebrahim (2011) conducted a systematic review and meta-analysis of studies assessing the effect of alcohol consumption on multiple CV outcomes. 84 studies were included from 4,235 prospective cohort studies. The pooled adjusted relative risks for alcohol drinkers relative to non drinkers was 0.75 for CVD mortality, 0.71 for incident CHD and 0.75 for CHD mortality. Dose-response analysis revealed that the lowest risk of CHD mortality occurred with 1–2 drinks a day but mechanism remained unclear, Similarly Klatsky AL (2015) reported the impact of alcohol on cardiovascular health as a low level of alcohol drinking has no clear relation to increased risk of any cardiovascular condition except stroke. Some supportive evidence shows that type of drinking beverage (particularly red wine) suggest that it might have extra CAD protection. The study concluded that light to moderate alcohol consumption is associated with a reduced risk of multiple CV outcome

Bessonova L et al (2011) examined the relationship between BMI and mortality among 115,433 women participating in the California Teachers Study. During follow up, 10,574 deaths occurred. Findings revealed that obesity was associated with increased all cause mortality, as well as death from any cancer and cardiovascular and respiratory diseases. These results help to identify groups at risk for BMI-related poor health outcomes. Hajian – Tilaki KO, Heidari B (2009), Feldsteiri CA, Akopian M, Olivieri AO, Kramer AP, Nasi M, Garrido D (2010) and Janghorbani M et al (2009) conducted a cross sectional survey on the prevalence of obesity and comparison of BMI and Waist Hip Ratio (WHR) as indication of HTN among adult population, the results showed that in women with high values of WHR, 24 h DBP was higher in those with BMI<25 than in those with BMI> or =25. Only in women mean pulse pressure (PP) significantly correlated with age ($r=0.38$; $P<0.0001$), WC ($r=0.22$; $P<0.005$), WHR ($r=0.21$, $P<0.008$), and BMI ($r=0.20$; $P<0.01$) while in men there was no significant correlation between variables. They concluded that outcomes showed a high pervasiveness of overweight-obesity (more than 56% of women's and 75% of men) in our hospital based sample of essential hypertension and that the WHR offers extra data past BMI and WC to foresee the hypertension hazard condition and thereby it prevent the CAD complication.

A series of cross sectional surveys conducted by Logaraj M., Balaji R., John K R., Shailendra Kumar B., Hegde(2014)., Sharma et al (2011)., Sukanta Mandal., Jyoti Bikash Saha., and Partha Pratim Pal (2009) to compare the prevalence of CAD risk factors among urban and rural population, results demonstrated that there was significant prevalence of risk factors of both men and women respectively with smoking or tobacco use in 209(37.6%) and 12(2.2%), obesity in 303(54.5%) and 350(61.3%), hypertension in 322(57.9%) and 279(48.9%), diabetes in 88(25.9%) and 64(21.1%) and low HDL cholesterol 103(30.3%) and 83(27.3%) subjects and reduced intake of vegetables and fruits were more prevalence in rural population whereas reduced PA, increased BMI, systolic and diastolic HTN was noticed in urban population.

Jihyun AN et al (2014) conducted a retrospective study among 1,045 patients with liver cirrhosis. The main aim was to investigate the prevalence of silent CAD compared with the general population by using purposive sampling The results showed the prevalence of occult obstructive CAD among asymptomatic cirrhotic patients and non-hepatic subjects. Conventional cardiovascular danger variables were observed to be

identified with basic coronary stenosis in cirrhotic patients, and consequently might be useful indicators for more watchful preoperative assessment of coronary danger.

SECTION 2.3.2 CRITICAL REVIEWS RELATED TO GENERAL AWARENESS REGARDING RISK FACTORS FOR CAD

Goyal A, Yusuf S (2010) conducted a hospital-based, cross sectional study at All India Institute of Medical Sciences (AIIMS), a major tertiary care hospital in New Delhi, India. Participants (n = 217) recruited from patient waiting areas randomly were provided with standardized questionnaires to assess their knowledge of modifiable risk factors. The risk factors specifically included smoking, hypertension, elevated cholesterol levels, diabetes mellitus and obesity. Identifying 3 or less risk factors from a total of 5 was regarded as poor knowledge level, whereas identifying 4 or more risk factors was regarded as a good knowledge level. A multiple logistic regression model was used to isolate independent demographic markers predictive of a participant's level of knowledge. 41% of the sample surveyed had a good level of knowledge. 68%, 72%, 73% and 57% of the population identified smoking, obesity, hypertension, and high cholesterol correctly, respectively. 30% identified diabetes mellitus as a modifiable risk factor. In multiple logistic regression analysis independent demographic predictors of a good knowledge level with a statistically significant ($p < 0.05$) adjusted odds ratio (aOR) were: routine exercise of moderate intensity aOR 8.41 (compared to infrequent or no exercise), no history of smoking, aOR 8.25, and former smokers, aOR 48.28 (compared to current smokers). Although statistically insignificant, a trend towards a good knowledge level was associated with higher levels of education.

Several descriptive cross sectional studies were done to determine the knowledge and awareness of risk factors for CVD among general public in different places. One of the studies by Joby Francis, Josmi Jose, Joyse Sunny K, Juvairiya U S and Sanil Varghese (2014) reported that 98% had average level of knowledge regarding CV risk factors. There was a significant association between knowledge and age and knowledge and education. Hence it is necessary to educate the people in community regarding CV risk factors. Kirkland SA, MacLean DR, Langelle DB, Joffres MR, McPherson KM, Andrew P (2009) demonstrated the findings smoking and stress were manifested as a major cause of heart disease by the greatest proportion of participants (41% men and 44% women respectively). Hypertension was mentioned only by 16% men and women

did not differ in their awareness of high BP (23%), smoking (41%), excess weight (30%), and physical inactivity (28%) as causes for heart disease.

McDermott MM, Mandapat AC, Moates A, Albay M, Chiou E, Celic L (2010), Bayne-Smith M, Fardy PS, Azzollini A, Magel J, Scmitz KH, Agin D (2010) conducted a cross sectional survey by using a purposive sampling to determine knowledge and awareness regarding CAD and coronary angiography among students. The mean score of 48% students correctly defined coronary angiography. Knowledge of 55% of students was based on personal and family experience of heart disease. Only half of the students were aware about coronary angiography. The mean knowledge score among them was above the median score, but not up to the mark. Similarly Familoni I F and Familoni O B (2011) evaluated the knowledge and awareness to CAD risk factors in Oyo state, Nigeria among sedentary teachers and reported that the information level was deficient and the capability in pure science did not drastically influence this knowledge. The study reasoned that knowledge base of the teachers should be made strides.

The twin researchers Haidinger T. et al and Uchenna D I. Ambakederemo T E. Jesuorobo D E. and Uchenna D I. , Ambakederemo T E. , Jesuorobo D E (2012) conducted two different cross sectional studies to assess individual CVD risk factors awareness, preventive action taken and the barriers to CV health among 573 women and 336 men who were randomly chosen. The results showed that knowledge about risk factors for CVD needs to be improved in both sexes.. Uchenna et al (2012) stated that there was no significant difference between level of education and gender with awareness of heart disease and its prevention. This study concluded that education on disease and lifestyle modification is necessary. However great effort is needed to inform men, compared with women, about the various ways to prevent CVD and to motivate them to take preventive action.

Jerilyn Allen K, Alison Purcell, Sarah Szanton, and Cheryl Dennison R (2010) conducted a cross sectional study among DM patients from a low socio economic background to determine the CVD risk perception 143 DM patients at urban community were the samples in Baltimore. Results revealed that 75% perceived that they had a 50% or smaller risk of developing CVD. The study concluded that comprehensive care for urban, poor, diabetic patients calls for effective communication of CVD risk and its risk

factors. Liesbeth Claassen et al (2011) reported that the association between risk factors and perceived CVD risk were weak with increased risk for CVD (aged 57–79 yrs) .The study concluded that to improve risk perception, health professionals need to educate about how personal risk factors can contribute to the development of CVD.

Jibril Mohammed (2012) and Seef S, Jeppsson A, Stafstrom M (2013) conducted a descriptive cross sectional studies to assess knowledge about CHD, attitude towards prevention and risk reduction barriers. The studies revealed that majority of the samples had moderate knowledge and had poor attitude towards prevention of CAD and thus concluded that the health system needs to engage patients in their plans and break related barriers, with development of health education programs based on needs assessment. Mukattash T L et al (2012) also reported on this study finding that general public had a limited knowledge and awareness of CVD but had moderate attitude towards prevention of CAD.

Lori Mosca et al., (2009) conducted an experimental study on National Study of Physician Awareness and Adherence to Cardiovascular Disease Prevention Guidelines. An online investigation of 500 randomly selected physicians(300 primary care physicians, 100 obstetricians/gynecologists, and 100 cardiologists) utilizing an standardized questionnaire to survey awareness of, selection of, and boundaries to national cardio vascular disease. Counteractive action rules by specialty. The study concluded that perception of risk was the essential component connected with cardiovascular diseases preventive recommendations. Educational interventions for doctors are expected to enhance the quality of cardio vascular illness preventive care and lower morbidity and mortality from cardio vascular disease for men and women.

SECTION 2.3.3: CRITICAL REVIEWS RELATED TO STRATEGIES FOR CONTROL OF CAD RISK FACTORS

Radha Acharya Pandey, Smith Khadka, (2012) reported in a cross sectional study that 42.2% of the samples had inadequate knowledge on coronary heart disease. This study recommended that awareness programmes could be beneficial on prevention of coronary heart disease. A series of researchers Ms. Leela Maheswari, (2015), Ajitha Ninan., Juny Acosta., Theodora Kulesza., Patrick Mattis., Chery Holly (2013) and Attarchi M., Mohammad S., Nojomi M and Labbafinejad Y., (2014) conducted cross

sectional studies to assess the effectiveness of structured teaching programs(STP) on knowledge regarding prevention of CAD among attending in outpatient department of selected hospitals. Findings revealed that most of the people gained good knowledge after administration of STP. It shows the effectiveness of STP to prevention of CAD. Similarly Shalet Alex, Anacy Ramesh, Vidya Sahare (2014) reported that 65% of samples increased satisfactory knowledge in risk factors of CAD, 73% of samples gained knowledge with regular checkups, and 49% of samples had a good level of knowledge. The regression investigation revealed that the female gender, age above 28 yrs, instruction level higher than secondary school training, BMI >25 k/m², history of lipidemia, DM, every day activity and practice were significantly related with great knowledge of CAD

A cohort study by Chiuve SE., McCullough ML., Sacks FM., Rimm EB., (2010) to assess the level of risk and prevention of CAD among different population, concluded that adherence to healthy lifestyle habits may prevent a majority of CHD events among US healthy men. Similarly Franklin et al., (2009) reported the results that in the control community the risk of CVD increased over two years, but in the intervention communities there was a substantial and sustained decrease in risk following adherence to healthy lifestyle habits. The net difference in estimated total risk between control and intervention samples was 23-28%.

With regard to HTN Pearson TA et al., (2011) , Bazzarre TL et al (2010), Chobanian AV et al (2009) conducted cohort studies to assess the effectiveness of intervention strategies to reduce HTN and reported that behavioral and pharmacological strategies can effective in reducing B.P, but Appel LJ et al (2009), Brag GA et al (2010) and Sacks et al (2009) reported that dietary changes, sodium reduction and weight reduction is effective in control of B.P. were as Svetlceyz, Earlinger TP, Vollmer WM, Feldstein A et al (2010) and Douglas JG et al (2011) conducted a PREMIER trail and compared the effectiveness of a multi component lifestyle intervention (group and individual counseling on weight loss, reduced sodium intake, increased PA and limited alcohol consumption) with the same intervention enhanced with the DASH diet or advice only. The study identified that Multicomponent Lifestyle intervention significant and reduced B.P. Whereas Pickering TG., Miller NH., Ogedeghe G., Karakoff LR., Artinian NT and Goff D et al (2010) stated that self monitoring is effective in improving the B.P

control. But Ramon Estruch et al (2013) stated that along Mediterranean diet supplemented with extra-virgin olive oil or nuts reduced the mortality of major CV events.

With regard to hyper cholestremia Davis et al (2009) conducted a cross sectional study on dyslipidemia intervention among chronic outpatients and the result showed that a brief dietary assessment and 5 – 10 min dietary counseling sessions with video showed that effective in reducing in reducing the total cholesterol and LDL in intervention group than in control group.

A series of prospective studies by Louis J., Ignarro, Maria Leisia Balestrien, Clauedio Napote (2010) and Napoli et al (2009), Thamson et al (2009), Wannamethee et al (2010) and Michael J., Lamonte, Steveon N., Blair and Timothy S church (2009) assessed the effectiveness of exercises on cardiovascular health among at risk clients for CVD. The results demonstrated that light/moderate exercises are reduce the CVD risk and progression of atherosclerosis in CAD by increasing the bio availability of nitric oxide and vascular protection by Napoli et al (2009), Kingwell et al (2010) and Stetano GB (2010). Whereas inactivity enhances vascular oxygen radical production, endothelial dysfunction and atherosclerosis.

With regard to exercise strengthening program, the meta analysis studies by Tanasesw .M et al (2009) and Smart. N, Marwick. TH (2008) and Manson et al (2010) explained the effectiveness of 30 min/day strength training or vigorous exercises may reduce the risk of an initial coronary event and .pulmonary events. Similarly Pollock et al in AHA science advisory (2009) stated that physical exercises enhances the cardiovascular health, reduction of sub-maximal heart rate, systolic blood pressure and there by decrease myocardial oxygen requirements during moderate to vigorous activities

A series of cohort and observational studies such as British Regional Heart Study, Men and Women in the study of Estern Finnus and women in the Iowa, Womens Health Study and Nurses' Health Study, Womens Health Study and Womens Health Initiative (2013) and Manson et al (2010) among women's , reported that physical activity had a 33% lower age – adjusted risk of developing DM compared with women reporting no exercise ($p < 0.000$).

Svetlana, Helena Lira, Jenni leppavuri, Taina Remes, Heikki Tikkanen and Kaisupitkala (2013) , Craig .A Emter et al (2009), Adamu B, Sani MU, Abdu A. (2010), Lippincott MF, Desai A, (2011) and Carlow et al (2011) studied the effectiveness of exercise intervention regarding prevention of CAD risk factors, the researchers reported that exercise training had anti – inflammatory effect, slow the progression of progression or partially reduce the severity of CAD and help in weight loss. Similarly endurance phase can reduce the B.P, serum triglyceride, increase the HDL, improves in insulin sensitivity and glucose homeostasis, thereby reduces the incidence of obesity, decrease the sympathetic tone and enhanced parasympathetic tone, Shane. A, Philips, Emon Das, Jingli Wang, Kirk Wood Pritchard and David. D, Guttermant in (2011) explained the effectiveness of aerobic exercise on protection against the impaired endothelium and dependent vasodilatation in sedentary samples, following an acute episode of HTN.

After an acute episode of HTN among sedentary samples Shane A., Philips, Emon Das, Jingli Wang, Kirk Wood Pritchard and David D., Guttermant (2011) proved the effectiveness of aerobic exercise on protection against the impaired endothelium and dependent vasodilatation.

Joann Manson. MD in (2009) and Larcroise AL et al (2009) conducted a prospective from a large cohort studies among women and compared effectiveness of brisk walking with vigorous exercises and both. The result stated that who engaged both brisk walking and vigorous exercise had greater reduction in coronary events than who participated in either walking or vigorous exercise alone. It indicated that combinations of brisk walking and vigorous exercise had good effect in reducing the CHD.

The **Global Recommendations** on physical activity for health by **WHO (2015)** stated that in order to make exercise effective, it should be sustained for long term, be regular, and for at least 4 – 5 times / week about 30 min.

SUMMARY

After extensive review of literature investigator found that prevalence of CAD risk factors among younger's than the older population and comparing with various studies indicate that the mortality and morbidity rate of CAD can reduced by promoting the knowledge and practice skill through the various educational resources.

RESEARCH METHODOLOGY

Methodology of research organizes all the components of study in a way that most likely will lead to valid answers for the problems that have been posted (burns and groove). this chapter deals with the methodology adopted for the study. it includes the research approach, research design, variables, setting, population, sample and criteria for selection of the sample, sample size, sampling technique, development and description of tool, content validity, pilot study, and reliability of the tool, data collection procedure and plan for data analysis.

3.1 RESEARCH APPROACH

A quantitative research approach was used in this study.

3.2 RESEARCH DESIGN

. Based on Polit and Becker (2011) this study design was termed as quasi-experimental, as the investigator has incorporated an intervention and a control group but no randomization in sample selection. The schematic representation of the design is shown below

Assessment the level of risk for developing CAD by using Framingham Risk Assessment Tool to identify clients with mild or moderate risk.	Group	Pretest (O ₁)	Intervention (×)	Post test (O ₂)
	Experimental group	Assessment of the pre test level of knowledge regarding prevention of CAD using structured interview schedule.	<p>Heart Smart Package (HSP): Lecture cum discussion aided by power point presentation regarding CAD risk factors and its prevention. Demonstration of cardio exercises. Re-demonstration of cardio exercises. Reinforcement on prevention of CAD through a booklet.</p>	Assessment of the post-test level of knowledge and skill by using structured interview schedule, and observational checklist.
Control group	Hospital routine management and information (pharmacy laboratory investigations and regular checkups for manage risk factors)			Assessment of the post test level of knowledge using structured interview schedule.

3.3 VARIABLES

3.3.1 Independent Variable

Heart Smart Package on prevention of CAD.

3.3.2 Dependent Variables

Level of Knowledge and skill regarding prevention of CAD.

3.3.3 Extraneous Variables

Previous exposure to teaching on control of CAD related risk, presence of physical disabilities

3.4 SETTING OF THE STUDY

The setting was RUSH Multispecialty Hospital which is a 450 bedded semi government hospital rendering outpatient and inpatient services. It has cardiology, urology, nephrology, gastroenterology, endocrinology, casualty, maternity, ENT and medical departments. The Chronic outpatient dept. functions in with two different blocks, which is situated within the hospital and caters to about 80 patients per day. They do not conduct any medical camp or outreach services

3.5 POPULATION

3.5.1 Target population

Clients who are at mild or moderate risk of developing CAD based on the Framingham Risk Assessment Tool

3.5.2 Accessible Population

At risk clients who were visiting Chronic Outpatient Department at RUSH Multispecialty Hospital, Tirupathi, Andhra Pradesh.

3.6 SAMPLE

Clients who had mild or moderate risk of developing CAD and who fulfilled the sample selection criteria.

3.7 SAMPLE SIZE

Sample of 64 at risk clients (32 each in the experimental and control group), who fulfilled the inclusion criteria.

3.8 CRITERIA FOR SAMPLE SELECTION

3.8.1 Inclusion criteria: Clients who

1. were aged between 20-70 years
2. had low or moderate risk for CAD (identified using Framingham Risk Assessment Tool)
3. were attending Chronic outpatient clinics
4. were willing to participate.
5. were able to understand Telugu/English

3.8.2 Exclusion criteria: Clients

1. who were acutely ill
2. with severe visual/ auditory/ cognitive impairment.
3. who were physically challenged
4. who had undergone any awareness program on prevention of CAD.
5. who had already been diagnosed with CAD or any other cardiac disorders.

3.9 SAMPLING TECHNIQUE

Purposive sampling technique was used to select samples. Clients with low and moderate score on the Framingham Cardiovascular Disease Risk Assessment Tool were included in the study with samples attending chronic outpatient in block I as experimental group and block II as control group.

3.10 DEVELOPMENT AND DESCRIPTION OF THE TOOL

After a broad review of literature, examination with the specialists and with the investigators proficient experience, a interview schedule was produced to assess the level of knowledge and observational checklist to evaluate the skill of the participants.

The tool constructed in this study has two parts:

3.10.1: Assessment Tools

3.10.2: Intervention tool – Heart Smart Intervention Package

3.10.1 Assessment Tools

Tool I: Framingham Cardiovascular Disease Risk Assessment tool

Tool II: Assessment of the demographic variables.

Tool III: Structured interview schedule to assess the knowledge level of clients regarding risk factors and prevention of CAD.

Tool IV: Observational checklist to assess skill in performing Cardio exercises

Tool I: Framingham Cardiovascular Disease Risk Assessment Tool

It consists of risk factors such as age, gender, total cholesterol, HDL, smokers, non-smokers and systolic hypertension categorized separately for men and women.

Scoring

Each risk factor has separate criteria with points added together and given a percentage to classify patients into low, moderate and high risk respectively

Interpretation of Framingham cardiovascular risk assessment tool

Score	Inference
<10%	Mild risk
10-20%	Moderate risk
>20%	High risk

Tool II: Demographic Profile:

It consists of demographic variables:

- Age, gender, educational qualification, occupation, marital status, religion, family income, area of residence, type of family, family history of CAD, nature of relationship history of co-morbid illness, diet pattern and any habit of smoking of smoking
- Biological variables: Height, weight, BMI and fasting blood sugar level.

Tool III: Structured interview schedule

This part consisted of structured interview schedule to assess the knowledge level of at risk clients regarding risk factors and prevention of CAD. It consists of 25 questions.

Each question ended with multiple choices. Risk clients were asked to select the most appropriate answer from the four options given.

Scoring key

Each correct answer was given '1' mark, and wrong answer or unattended question was given '0' mark. The raw score was converted to % to interpret the level of knowledge. The overall score was 25.

Score	Level of Knowledge
$\leq 50\%$	Inadequate level of Knowledge
51-75%	Moderate level of Knowledge
$> 75\%$	Adequate level of Knowledge

Tool IV: Observational check list

It consists of 20 questions, The scoring given is 1 mark for "Yes" and 0 mark for "No". The total score is 20 with a minimum score of 0, and maximum 20.

Interpretation

Score	Interpretation
$\leq 50\%$	Needs improvement in skill
51%-74%	Fair skill
$\geq 75\%$	Good skill

3.10.2 INTERVENTION TOOL

The interventional tool prepared by the investigator is the Heart Smart Package, consisting of a set of interventions, administered to at risk clients, in order to improve their level of knowledge and skill regarding prevention of CAD, through:

- A) Lecture cum discussion aided by power point presentation for 5-7 members for about 30 min duration on
- General information on meaning of CAD, risk factors, causes, warning signs, and complications of CAD

- Strategies for risk reduction: Healthy diet, regular exercises, cessation of smoking and alcohol, management of co-morbid illness and monitoring optimum health.
- B) Demonstration of cardio exercises by the investigator on warm-up, twist crunch, squat and over head press, static lunge, deep breathing exercises and cool down exercises to be performed for 3 min each, for a total duration of 20 min, once daily.
- C) Re-demonstration of the cardio exercises by risk clients.
- D) Re-inforcement on prevention of CAD through a booklet.

3.11 CONTENT VALIDITY

The content validity of the data collection tool and intervention tool was ascertained with the expert's opinion in the following field of expertise,

- Cardiologist-2
- Medical-Surgical Nursing experts - 4
- Physiotherapist – 1

Modifications suggested by the experts in the tool included inclusion of few additional changes in knowledge questionnaire. These changes were incorporated in the tool. All the experts had their consensus and then the tool was finalized.

3.12 ETHICAL CONSIDERATION

Ethics is a system of moral values that is concerned with the degree to which the research procedures adheres to the professional, legal and social obligations to the study participants, **Polit and Hungler (2012)**.

The ethical principles followed in the study were:

The investigator followed the fundamental ethical principle of beneficence by adhering to

1. Beneficence

a) Freedom from harm and discomfort

The study was beneficial for the samples as it enhanced their knowledge regarding prevention of CAD. Safe environment was provided for the samples to re demonstrate the cardio-exercise.

b) Protection from harm and discomfort

The investigator explained the procedure and the nature of the study to the participants and ensured that none of the participants were exploited or denied fair treatment.

2. Respect For Human Dignity

The investigator followed the second ethical principle of respect for human dignity. It includes the right to self determination and right to self disclosure.

a) The right to self determination

The investigator gave full freedom to the participants to decide voluntarily whether to participate in the study or to withdraw from the study at any point of time and the right to ask questions.

b) The right to full disclosure

The researcher fully described the nature and its purpose and steps involved in the study. The person's right to refuse participation and the researcher's responsibilities based on which both oral and written informed consent was obtained from the participants.

3. Justice

The selection of the study participants was completely based on research requirements. Privacy was maintained throughout the data collection.

a) Right to fair treatment

The researcher selected the study participants based on the research requirements. The investigator followed the rules and regulations of the Institutional ethical committee (ICCR). After completion of post test in the control group Heart Smart Package was administered

b) Right to privacy

The researcher maintained the participant's privacy throughout the study.

4. Confidentiality

The researcher maintained confidentiality of the data provided by the participants.

3.13 RELIABILITY OF THE TOOL

Variable	Tool	Method	Value	Inference
Knowledge	Structured interview schedule	Inter- rater	0.92	Reliable
Skill	Observational checklist	Inter-rater	0.95	Reliable

The above table shows that the tool was highly reliable and feasible for utilization in the main study.

3.14 PILOT STUDY

Pilot study was conducted at RUSH Multi Specialty Hospital at Tirupathi, Andhra Pradesh. A formal written permission was obtained from the Principal of Omayal Achi College of Nursing, and the Director and Head of the Department of General Medicine of RUSH Multi Specialty Hospital. The pilot study was conducted for a period of one week from 22-5-2015 to 27-5-2015.

The investigator screened the clients who were at risk for developing CAD using Framingham Cardiovascular Disease Risk Assessment Tool. Using non-probability purposive sampling technique, 5 patients at risk for CAD were allotted to the experimental group and 5 to the control group. A brief explanation was given regarding the purpose of the study and written consent was obtained from the participants.

On the first day, the experimental group samples were seated comfortably in a conducive room and demographic details were obtained from them. The knowledge regarding CAD was assessed using structured interview schedule, following which the investigator administered the Heart Smart Package to the experimental group. This included lecture cum discussion, power point presentation regarding strategies for prevention of coronary artery disease for 30-35 min, along with demonstration of cardio exercises for 20 min. The reinforcement booklet was also given to participants. The same sequence was followed for the control group except for hospital routine instead of HSP. At the end of 7th day, post test was conducted using the same questionnaire for both the experimental and control group and the post test level of skill through re-demonstration by the groups, was assessed by using the observational check list. The HSP was administered to the control group after the post test.

The pilot study analysis revealed that the t value of 9.750 to determine the effectiveness of selected nursing intervention package showed high significance at $p < 0.001$ level. The results of pilot study revealed that the assessment and intervention tool was reliable, feasible, and practicable to conduct the main study.

3.15 PROCEDURE FOR DATA COLLECTION

The main study was conducted after obtaining formal permission from the Principal of Omayal Achi College of Nursing and the Director and Head of the Department of General Medicine of RUSH Multi Specialty Hospital at Tirupathi, AndhraPradesh. The data collected for a period of 1 month duration (19-05-15 to 20-06-15).

A brief self introduction along with an explanation of the purpose of the study was given to the participants. After obtaining written informed consent from participants, data collection commenced with the control group followed by the experimental group.

The investigator screened 40 patients from Block-I by using Framingham Cardiovascular Disease Risk Assessment Tool and found that 32 patients were in low and moderate risk for CAD respectively in the experimental group. Similarly, the investigator screened 38 clients from Block-II using the same tool and found that 32 patients had low and moderate risk for CAD respectively in the control group. Therefore a total of 64 clients (32 each in the experimental and control group) were selected as samples.

On the first day, the experimental group samples were seated comfortably in a conducive room and demographic details were obtained from them. The knowledge regarding CAD was assessed using structured interview schedule, following which the investigator administered the Heart Smart Package to the experimental group, which included Lecture cum discussion, power point presentation regarding strategies for prevention of coronary artery disease for 30-35 min, along with demonstration of cardio exercises for 20 min. The reinforcement booklet was also given to participants. The same sequence was followed for the control group except for hospital routine instead of HSP. At the end of 7th day, post test was conducted using the same questionnaire for both the experimental and control group and the post test level of skill through redemonstration by the groups, was assessed by using the observational check list. The HSP was administered to the control group after completion the post test.

3.16 PLAN FOR DATA ANALYSIS

Data was analyzed by using both descriptive and inferential statistics.

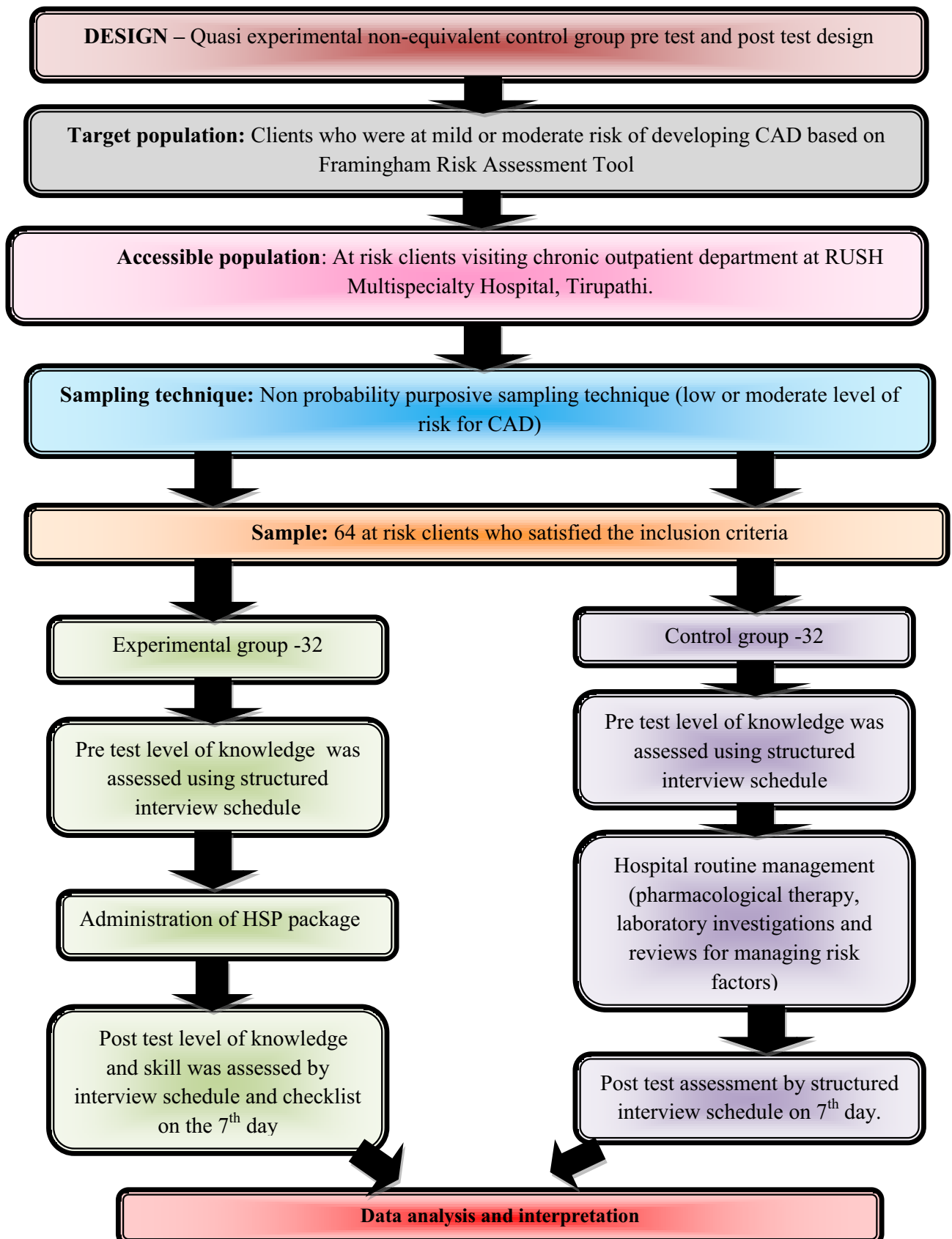
Descriptive Statistics

1. Frequency and percentage distribution to analyze the demographic data among at risk clients.
2. Mean and standard deviation was used to assess level of knowledge and skill.

Inferential Statistics

1. Paired 't' and unpaired 't' test to compare the data between the experimental and control group.
2. Correlation co-efficient to find the relationship between the mean differed level of Knowledge and skill between experimental and control group.
3. Gain score ANOVA, unpaired 't' and chi square was used to associate the mean differed level of demographic variables with the level of knowledge and skill among at risk clients.

Fig.3.1.1 SCHEMATIC REPRESENTATION OF RESEARCH METHODOLOGY



DATA ANALYSIS AND INTERPRETATION

Data analysis refers to the process of organizing and synthesizing the data in such a way that the research question can be answered and hypothesis tested (Polit and Hungler, 2010).

This chapter deals with the analysis and interpretation of the data to assess the effectiveness of Heart Smart Package on knowledge and skill regarding prevention of CAD among at risk clients attending chronic outpatient department, in selected hospitals at Andhra Pradesh.

The collected data was grouped and analyzed using descriptive and inferential statistics, and the results are presented under the following sections.

ORGANIZATION OF THE DATA

Section 4.1: Description of demographic variables in the experimental and control group.

Section 4.2: Assessment of the level of risk for developing CAD in the experimental and control group.

Section 4.3: Assessment of the effectiveness of Heart Smart Package on the level of knowledge regarding prevention of CAD among at risk clients.

Section 4.4: Assessment of the post test level of skill regarding prevention of CAD among the experimental group

Section 4.5: Correlation of the post test level of knowledge with skill regarding prevention of CAD in the experimental group.

Section 4.6: Association of the selected demographic variables with the mean differed knowledge and post test skill score regarding prevention of CAD among at risk clients

SECTION 4.1: DESCRIPTION OF DEMOGRAPHIC VARIABLES OF AT RISK CLIENTS IN THE EXPERIMENTAL AND CONTROL GROUP.

TABLE 4.1.1: Frequency and percentage distribution of selected demographic variables such as age, gender, education, occupation, marital status, religion and area of residence in the experimental and control group.

N=64(32+32)

S.No.	Demographic variable	Group			
		Experimental (n=32)		Control (n=32)	
		n	%	n	%
1	Age (years)				
	20-40	4	12.5	2	6.3
	41-50	13	40.6	13	40.6
	51-60	15	46.9	17	53.1
2	Gender				
	Male	16	50.0	16	50.0
	Female	16	50.0	16	50.0
3	Education				
	Non- literate	2	6.3	2	6.3
	Primary School	7	21.9	5	15.6
	Middle school	18	56.3	13	40.6
	High school	3	9.4	9	28.1
	Higher school	2	6.3	3	9.4
4	Occupation				
	Unemployed	4	12.5	7	21.9
	Unskilled worker	6	18.8	6	18.8
	Semi skilled workers	16	50.0	9	28.2
	Skilled worker	4	12.5	6	18.8
	Own business	1	3.1	2	6.3
	Professional	1	3.1	2	6.3
5	Marital status				
	Married	31	96.9	31	96.9
	Unmarried	1	3.1	1	3.1
6	Religion				
	Hindu	26	81.3	24	75.0
	Muslim	5	15.6	6	18.8
	Christian	1	3.1	2	6.3
7	Area of residence				
	Slum	4	12.5	2	6.3
	Rural	4	12.5	3	9.3
	Semi Rural	10	31.2	11	34.4
	Urban	14	43.8	16	50.0

The above table shows that in the experimental and control group most of the clients were aged between 51 – 60 yrs, had completed middle school education, were employed semi skilled workers, were married, were Hindu and resided in urban areas.

Equal number of males and females were present in the both the groups

Table 4.1.2: Frequency and percentage distribution of selected demographic variables such as type of family, family monthly income, family history of CAD, nature of relationship with affected person and history of co – morbid illness.

N=64(32+32)					
S.No.	Demographic variable	Group			
		Experimental (n=32)		Control (n=32)	
		n	%	n	%
8	Type of family				
	Nuclear family	21	65.6	13	40.6
	Joint family	9	28.1	16	50.0
	Extended family	2	6.3	3	9.4
9	Family monthly income(in rupees)				
	< Rs.1802	1	3.1	2	6.3
	1801-5386	2	6.3	1	3.1
	5387-8988	1	3.1	1	3.1
	8989-13494	12	37.5	12	37.5
	13495-17999	16	50.0	16	50.0
	18000-36016	1	3.1	1	3.1
10	Family history of CAD				
	Yes	17	53.1	14	43.2
	No	15	46.9	18	56.3
11	Nature of relationship with affected person				
	Paternal	15	46.9	18	56.3
	Maternal	5	15.6	3	9.4
	Siblings	4	12.5	2	6.3
	Others	8	25.0	9	28.1
12	History of co-morbid illness				
	Hypertension	8	37.5	14	62.5
	Diabetes	9	44.5	8	55.5
	Both	10	60.0	5	40.0
	Others	5	60.0	5	40.0

The above table shows that in the experimental group most of the samples belonged to nuclear family with a family monthly income of Rs. 13495 – 17999 and more than half of samples had a family history of CAD. Out of which, most of them were afflicted with paternal relationship and had a history of diabetes and HTN as a co – morbid illness.

In the control group, most of the samples belonged to joint family, with a family monthly income of Rs. 13495 – 17999, who didn't had family history of CAD, out of which, most of them were afflicted with paternal relationship and had a history of HTN as a co – morbid illness.

Table 4.1.3: Frequency and percentage distribution of selected demographic variables such as dietary pattern, any previous information regarding prevention of CAD, source of information and habit of smoking in the experimental and control group.

N=64(32+32)

S.No	Demographic variable	Group			
		Experimental (n=32)		Control (n=32)	
		n	%	N	%
13	Dietary pattern				
	Vegetarian	2	6.3	1	3.1
	Non vegetarian	30	93.7	31	96.9
14	Any previous information regarding prevention of CAD				
	Yes	0	0	0	0
	No	32	100	32	100
15	If 'yes', specify the source				
	Nil	32	100	32	100
16	Any habit of smoking				
	Yes	13	40.6	15	46.9
	No	19	59.4	17	53.1
17	If 'yes', how many cigarettes per day				
	1 pack	5	38.5	2	13.3
	1- 2 packs	4	30.8	6	40.0
	> 2 packs	4	30.8	7	46.7

The above table shows that majority of them consumed non-vegetarian diet and none of them were having any previous information regarding CAD.

Similarly in both the groups, about half of the population were non-smokers and remaining were reported with the habit of smoking with more than 2 packs per day in the control group, while in the experimental group, it was either 1- 2 packs or >2packs/day

Table 4.1.4: Frequency and percentage distribution of selected biological variables such as height, weight, BMI kg/m² and fasting blood sugar in the experimental and control group.

N=64(32=32)

S.No.	Biological variable	Group			
		Experimental (n=32)		Control (n=32)	
		n	%	n	%
18	Height (cm)				
	145-155	2	6.3	1	3.1
	156-165	20	62.5	23	71.9
	166-175	10	31.3	8	25.0
19	Weight (kg)				
	< 50	2	6.3	1	3.1
	51-60	13	40.6	12	37.5
	61-70	17	53.1	19	59.4
20	BMI(kg/m²)				
	18-24	25	78.1	21	65.6
	> 24	7	21.9	11	34.4
21	Fasting blood sugar(mg/dl)				
	71-100 mg/dl	8	75.0	20	62.5
	101-200 mg/dl	28	25.0	12	37.5

In the both group, most of them were in the height of 156-165cm with a weight of 61-70kg and the BMI was 18-24.

Whereas the FBS was 71-100mg/dl in the control group and 101-200 mg/dl in the experimental group.

SECTION 4.2: ASSESSMENT OF THE LEVEL OF RISK FOR DEVELOPING CAD IN THE EXPERIMENTAL AND CONTROL GROUP.

Table 4.2.1: Frequency and percentage distribution of level of risk in the experimental and control group

N=64(32+32)

Risk	Low Risk		Intermediate Risk		High Risk	
	No.	%	No.	%	No.	%
Experimental group	23	71.9	9	28.1	0	0
Control group	24	75.0	8	25.0	0	0

The above table shows that frequency and percentage distribution of level of risk in the experimental and control group. The results showed that in both groups, majority of clients had low risk for CAD. None of them had high risk in both groups.

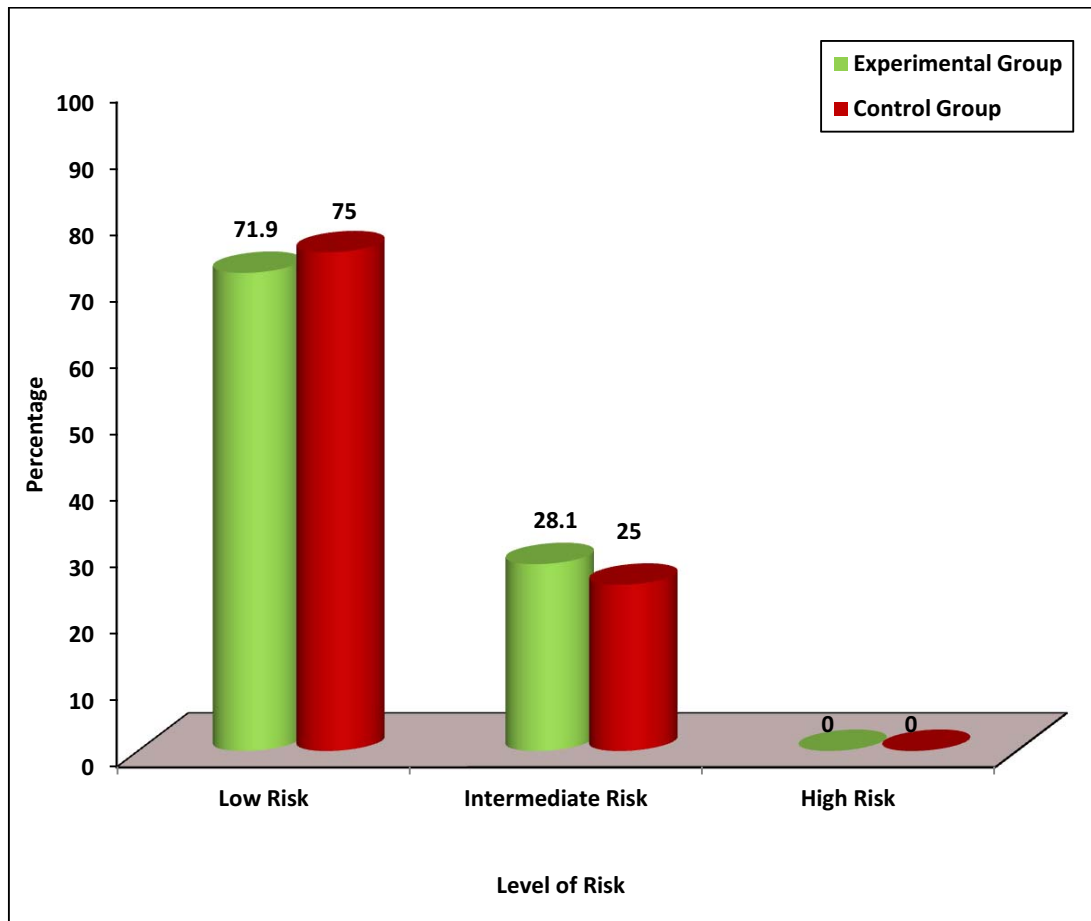


Figure 4.2.1: Percentage distribution of level of risk in the experimental and control group

SECTION 4.3: ASSESSMENT THE EFFECTIVENESS OF HEART SMART PACKAGE ON THE LEVEL OF KNOWLEDGE REGARDING PREVENTION OF CAD AMONG AT RISK CLIENTS.

Table 4.3.1: Frequency and percentage distribution of pretest level of knowledge regarding prevention of CAD among at risk clients in the experimental group.

n=32

Knowledge	Inadequate (≤50%)		Moderately Adequate (51 – 75%)		Adequate (>75%)	
	No.	%	No.	%	No.	%
General Information						
Risk factors	31	96.9	1	3.1	0	0.0
Causes	27	84.4	5	15.6	0	0.0
Warning signs	30	93.8	2	6.2	0	0.0
Prevention					0	0.0
Diet	25	78.1	7	21.1	0	0.0
Management of Co-morbid illness	31	96.9	1	3.1	0	0.0
Maintaining optimum health	30	93.8	2	6.2	0	0.0
Overall	29	90.6	3	9.4	0	0.0

The above table denotes frequency and percentage distribution of pretest level of knowledge regarding prevention of CAD among at risk patients in the experimental group, shows majority of clients were reported with inadequate knowledge

Table 4.3.2: Frequency and percentage distribution of posttest level of knowledge regarding prevention of CAD among at risk patients in the experimental group

n=32

Knowledge	Inadequate (≤50%)		Moderately Adequate (51 – 75%)		Adequate (>75%)	
	No.	%	No.	%	No.	%
General Information						
Risk factors	0	0	6	18.8	26	81.3
Causes	0	0	8	25.0	24	75.0
Warning signs	0	0	10	31.3	22	68.7
Prevention						
Diet	0	0	11	34.4	21	65.6
Management of Co-morbid illness	0	0	13	40.6	19	59.4
Maintaining optimum health	0	0	12	37.5	20	62.5
Overall	0	0	10	31.3	22	68.7

The above table regarding frequency and percentage distribution of posttest level of knowledge regarding prevention of CAD among at risk clients in the experimental group, shows that majority of clients had adequate knowledge

The result showed that that the Heart Smart Package was effective in improving the level of knowledge regarding prevention of CAD among at risk clients in the experimental group.

Table 4.3.3 Frequency and percentage distribution of pretest level of knowledge regarding CAD among at risk clients in the control group

N=32

Knowledge	Inadequate ($\leq 50\%$)		Moderately Adequate (51 – 75%)		Adequate ($\geq 75\%$)	
	No.	%	No.	%	No.	%
General Information						
Risk factors	30	93.8	2	6.3	0	0.0
Causes	26	81.3	6	18.8	0	0.0
Warning signs	29	90.6	3	9.4	0	0.0
Prevention						
Diet	24	75.0	8	25.0	0	0.0
Management of Co-morbid illness	29	90.6	3	9.4	0	0.0
Maintain optimum health	30	93.8	2	6.3	0	0.0
Overall	28	87.5	4	12.5	0	0

The above table regarding frequency and percentage distribution of pretest level of knowledge regarding prevention of CAD among at risk clients in the control group, shows that majority of clients had inadequate knowledge.

Table 4.3.4: Frequency and percentage distribution of posttest level of knowledge regarding CAD among at risk clients in the control group

N=32

Knowledge	Inadequate ($\leq 50\%$)		Moderately Adequate (51 – 75%)		Adequate ($\geq 75\%$)	
	No.	%	No.	%	No.	%
General Information						
Risk factors	30	93.8	2	6.3	0	0
Causes	24	75.0	8	25.0		
Warning signs	28	87.5	4	12.5	0	0
Prevention						
Diet	22	68.8	10	12.5	0	0
Management of Co-morbid illness	28	87.5	4	6.3	0	0
Maintain optimum health	30	93.8	2	6.3	0	0
Overall	27	84.4	5	12.5	0	0

The above table regarding frequency and percentage distribution of posttest level of knowledge regarding prevention of CAD among at risk clients in the control group, shows that in control group majority of samples had inadequate knowledge.

The results show that with routine health care information alone, there is no increase in the level of knowledge regarding prevention of CAD disease among the control group.

Table 4.3.5: Frequency and percentage distribution of overall level of knowledge score among the experimental and control group

N=64(32+32)

	Level of knowledge score	Experimental (n=32)		Control (n=32)		Chi-square test
		n	%	n	%	
Pretest	Inadequate	29	90.6	28	87.5	$\chi^2=0.16$ P=0.69 N.S
	Moderately adequate	3	9.4	4	12.5	
	Adequate	0	0.0	0	0.0	
	Total	32	100	32	100	
Posttest	Inadequate	0	0.0	27	84.4	$\chi^2=50.67$ P=0.001 S***
	Moderately adequate	10	31.3	5	15.6	
	Adequate	22	68.7	0	0.0	
	Total	32	100	32	100	

(*** Very high significant at $p \leq 0.001$, N.S = not significant)

The above table regarding frequency and percentage distribution of pre and the post test overall level of knowledge among the experimental and control group, shows that majority of clients in the experimental group gained adequate knowledge whereas in the control group most of the clients continued to have inadequate knowledge regarding prevention of CAD in the post test.

The post test chi-square value shows very high statistical significance at $p < 0.001$, indicating that both the groups were homogenous in the pretest but after the administration of HSP, the experimental group showed significant improvement in the overall level of knowledge regarding prevention CAD.

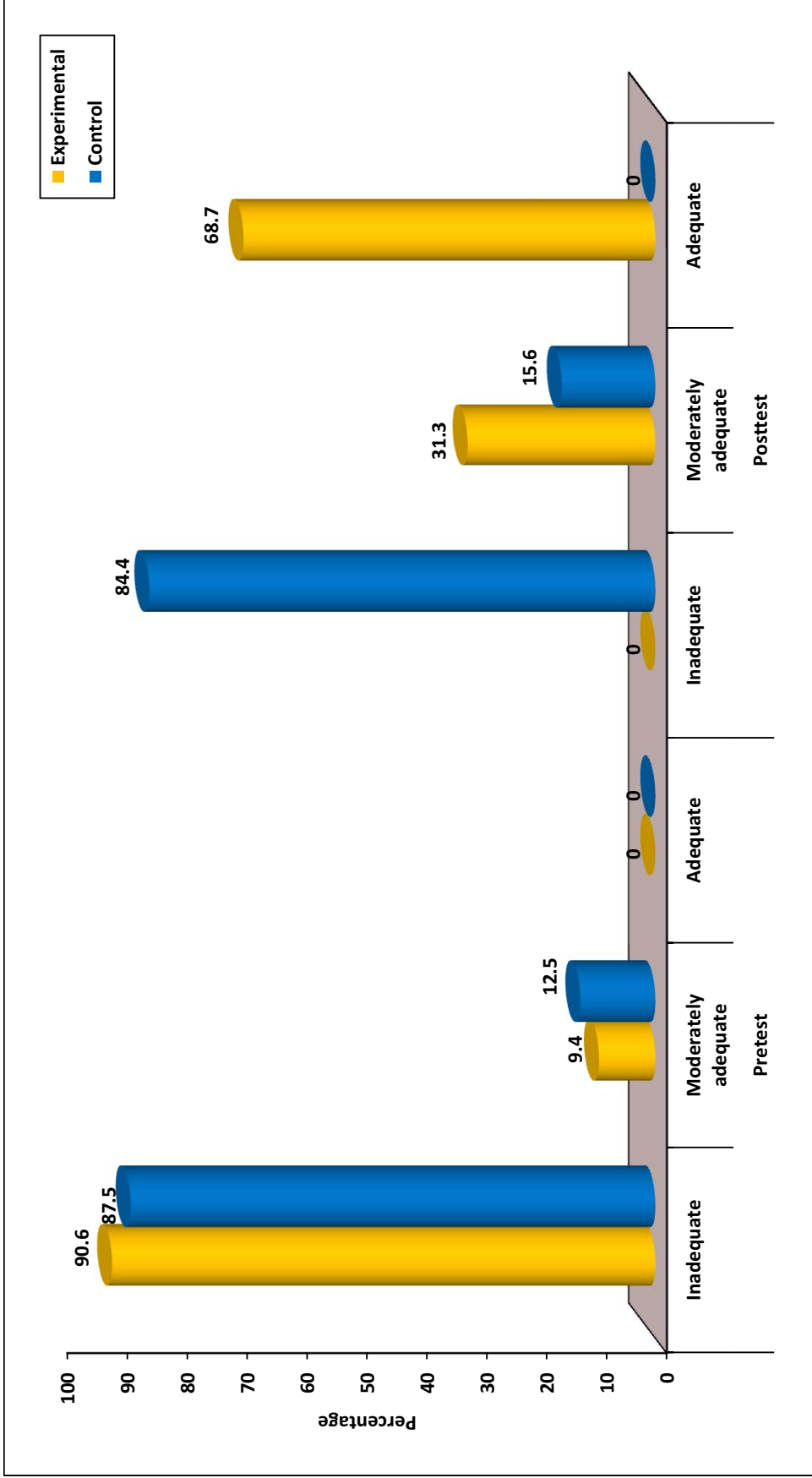


Figure 4.3.5: Percentage distribution of overall level of knowledge score among the experimental and control group

Table 4.3.6: Comparison of pretest and posttest level of knowledge regarding prevention of CAD among at risk clients in the experimental and control group

N=32

Level of knowledge	Pre test		Post test		Paired 't' test
	Mean	SD	Mean	SD	
Experimental group	9.22	2.07	20.03	3.05	t=21.33 p= 0.001 ***S
Control group	9.59	1.72	10.63	1.79	t=1.83 p=0.07 N.S

(* Significant at $p \leq 0.05$, ** Highly significant at $p \leq 0.01$, *** Very highly significant at $p \leq 0.001$, N.S = not significant)

The above table shows the comparison between pretest and post test knowledge scores regarding prevention of CAD among at risk clients in the experimental and control group

In the experimental group, the calculated paired 't' test value of 21.33 shows very high significance at $p < 0.000$ indicating the effectiveness of HSP in enhancing their knowledge when compared to the control group which showed a non-significant paired 't' value.

Table 4.3.7 Comparison of pre and post test level of knowledge regarding CAD among at risk clients between the experimental and control group

N=64(32+32)

	Group	Mean	S.D	Student independent 't' test
Pre test	Experimental	9.22	2.07	t=0.38
	Control	9.59	1.72	p=0.43 N.S
Post test	Experimental	20.03	3.05	t=9.40
	Control	10.63	1.79	p=0.001 *** S

(*** Very highly significant at $p \leq 0.001$, N.S = not significant)

The above table shows the comparison of pre and post test knowledge scores regarding prevention of CAD between the experimental and control group.

In the pretest, the calculated unpaired 't' value of 0.38 showed no statistical significance whereas the posttest unpaired 't' value of 9.40 showed high statistical significance at $p < 0.001$ level indicating the effectiveness of Heart Smart Package in improving the post test level of knowledge regarding prevention of CAD in the experimental group.

SECTION 4.4: ASSESSMENT OF THE POST TEST LEVEL OF SKILL REGARDING PREVENTION OF CAD AMONG THE EXPERIMENTAL GROUP

Table 4.4.1: Frequency and percentage distribution of posttest level of skill regarding prevention of CAD among at risk clients in the experimental group

n=32

Exercises	No. of questions	Experimental group		
		Mean	SD	%
Warm up exercises	4	3.84	.37	96.0
Twist crunch	4	3.75	.62	93.8
Squat and over head press	4	3.38	.79	84.5
Static lunge Deep breathing exercises	4	2.47	1.34	61.8
Cool down exercises	1	.66	.48	66.0
Total	3	2.63	.55	87.7
Overall	20	16.72	1.30	83.6

Post test	Needs Skill Improvement ($\leq 50\%$)		Fair skill (51 – 75%)		Good skill ($>75\%$)	
	No.	%	No.	%	No.	%
Skill	0	0	5	15.6	27	84.4

The above table reveals the post test level of skill regarding cardio exercises among at risk clients in the experimental group, 5 (15.6%) of the samples had fair skill and 27 (84.4%) had good skill.

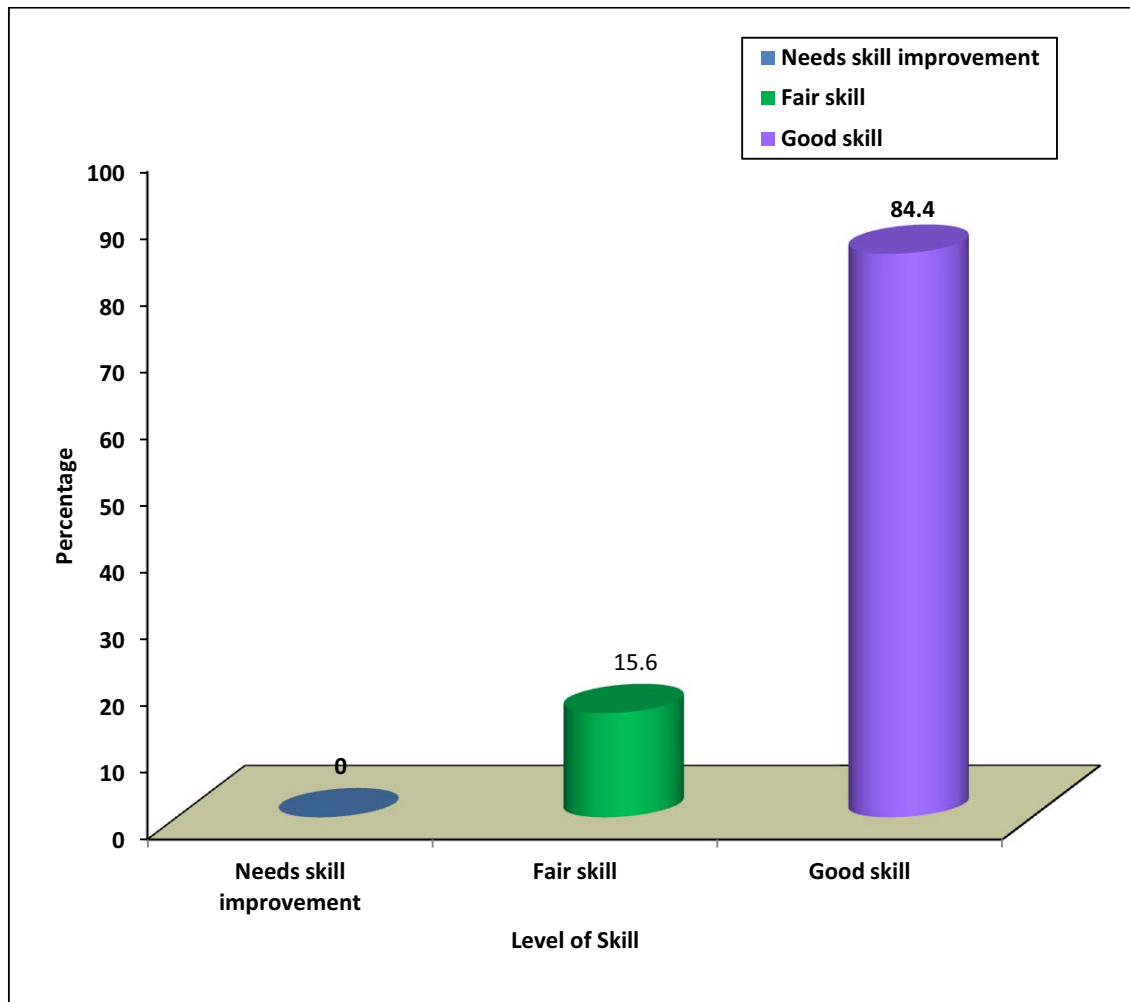


Figure 4.4.1: Percentage distribution of posttest level of skill regarding prevention of CAD among at risk clients in the experimental group

SECTION 4.5: CORRELATION OF THE POST TEST LEVEL OF KNOWLEDGE WITH SKILL REGARDING PREVENTION OF CAD IN THE EXPERIMENTAL GROUP

N=32

	Variables	Mean	SD	'r' value
Post test	Knowledge score	20.03	3.05	r = 0.56 P=0.001***
	Skill score	16.56	0.84	

(*** Very highly significant at $p \leq 0.001$, N.S = not significant.)

The above table regarding correlation between post test knowledge and skill score regarding prevention of CAD among at risk clients in the experimental group shows the 'r' value of 0.56 which indicates moderate positive correlation signifying that an improvement in knowledge has a positive influence on increasing the skill among at risk clients.

This proves that enhancement of the knowledge of at risk clients through the Heart Smart intervention package significantly improved the skill of the clients by enhancing their mastery of performing cardio exercises.

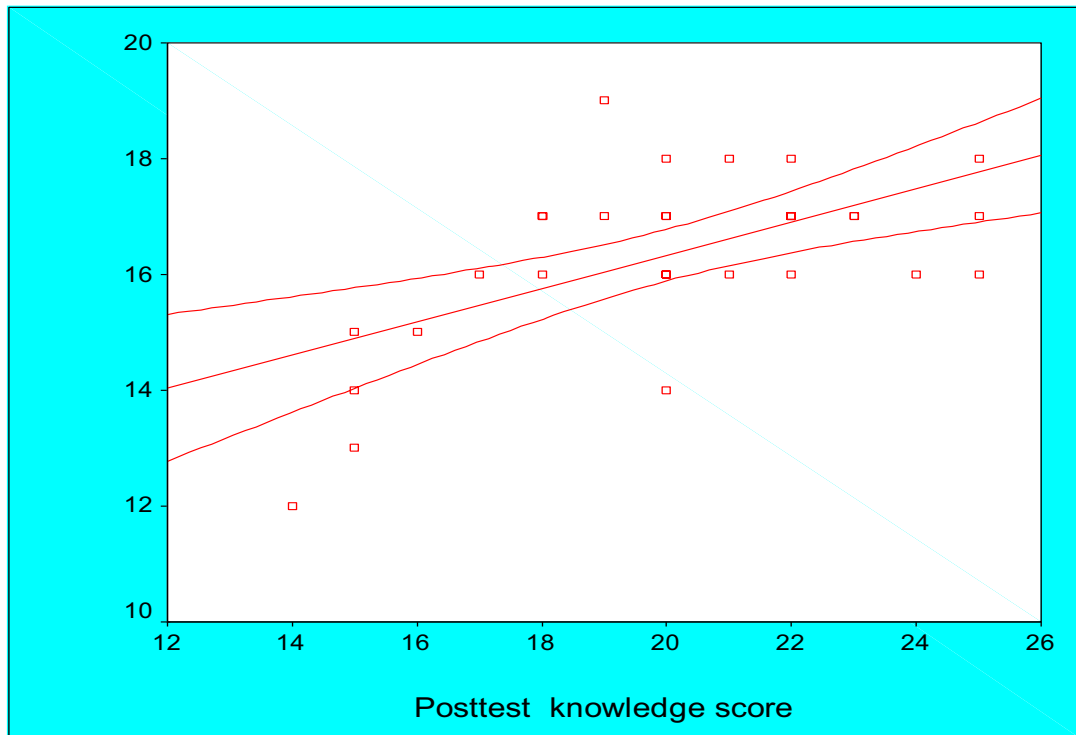


Figure 4.5.1: Correlation of the post test level of knowledge with skill regarding prevention of CAD in the experimental group

SECTION 4.6: ASSOCIATION OF SELECTED DEMOGRAPHIC VARIABLES WITH THE MEAN DIFFERED KNOWLEDGE AND SKILL SCORE REGARDING PREVENTION OF CAD IN THE EXPERIMENTAL GROUP

Table 4.6.1: Association of selected demographic variables with the mean differed level of knowledge gain score regarding prevention of CAD in the experimental group N=32

S.No.	Demographic variables	Level of knowledge gain score				Total	Chi square test
		Below average (≤ 10.81)		Above average (> 10.81)			
		n	%	n	%		
1	Age						$\chi^2=6.18$ P=0.05* Significant
	20-40 yrs	3	75.0	1	25.0	4	
	41-50 yrs	9	69.2	4	30.8	13	
	51-60 yrs	4	26.7	11	73.3	15	
2	Education						$\chi^2=10.86$ P=0.05* Significant
	Non- literate	2	100.0	0	0.0	2	
	Primary School	4	57.1	3	42.9	7	
	Middle school	10	55.6	8	44.4	18	
	High school	0	00.0	3	100.0	3	
	Higher school	0	00.0	2	100.0	2	
3	Family history of CAD						$\chi^2=6.14$ P=0.01** significant
	Yes	5	29.4	12	70.6	17	
	No	11	73.3	4	26.7	15	
4	Any habit of smoking						$\chi^2=6.35$ P=0.01** significant
	Yes	10	76.9	3	23.1	13	
	No	6	31.6	13	68.4	19	

(* Significant at $p \leq 0.05$, ** Highly significant at $p \leq 0.01$, *** Very highly significant at $p \leq 0.001$, N.S = not significant)

The above table shows the association between the level of knowledge gain score and selected demographic variables of the experimental group such as age, education, family history of CAD and habit of smoking.

Age and education showed mild statistical significance and family history of CAD and habit of smoking showed high statistical significance. This indicates that clients aged between 51 – 60 yrs, those with middle school education, having family history of CAD and non- smokers showed higher improvement in their level of knowledge regarding prevention of CAD in comparison to the other samples

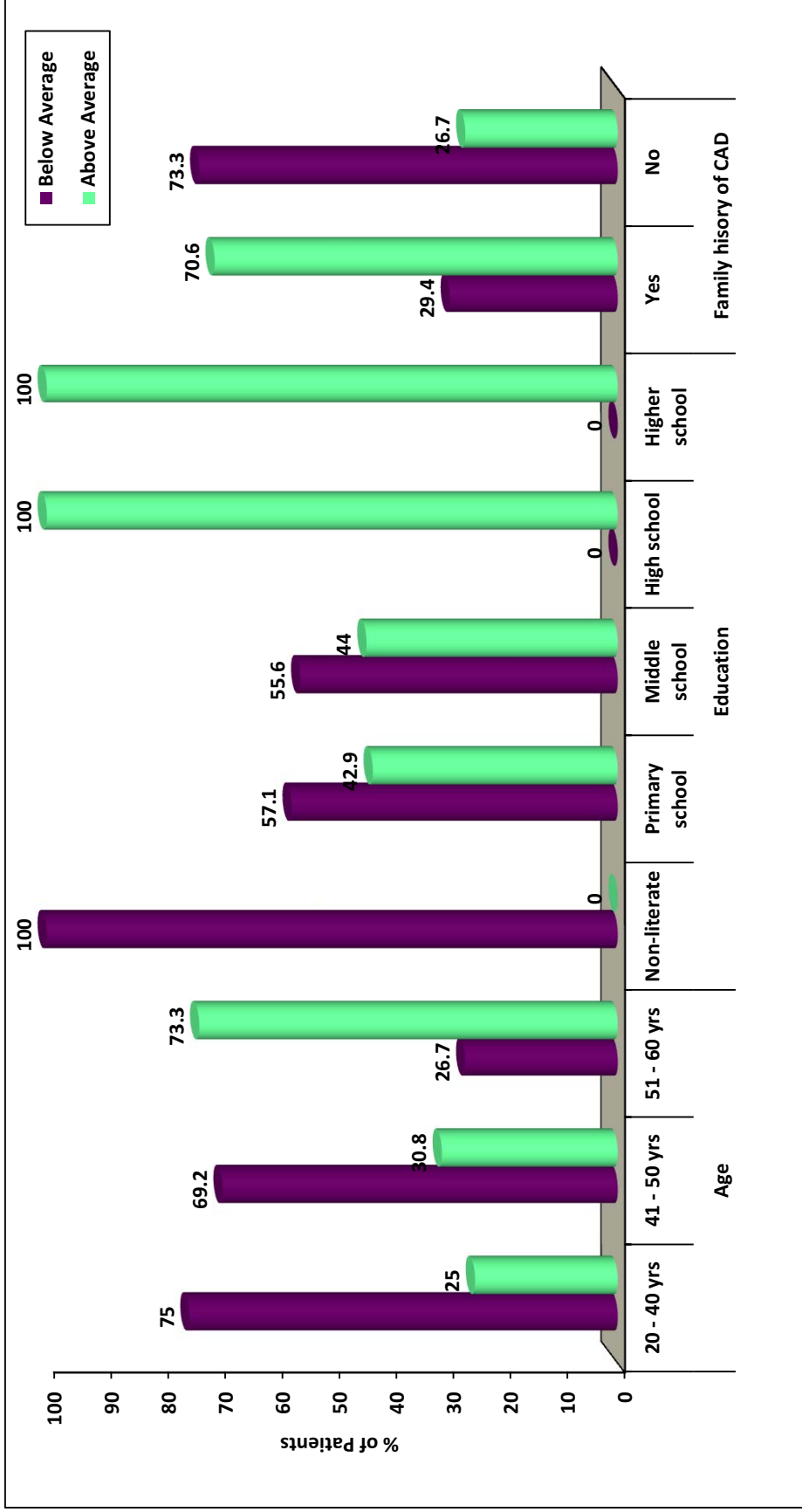


Table 4.6.1: Association of selected demographic variables with the mean differed level of knowledge gain score regarding prevention of CAD in the experimental group

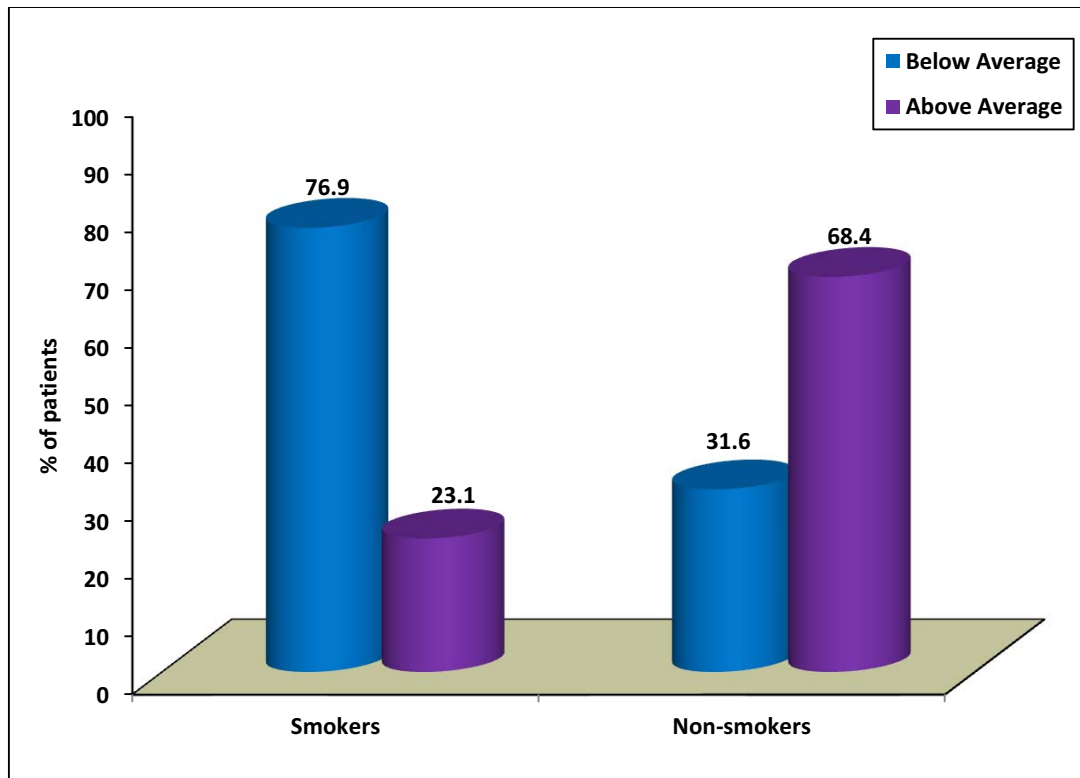


Figure 4.6.1: Association of selected demographic variables with the mean differed level of knowledge gain score regarding prevention of CAD in the experimental group

Table 4.6.2: Association of selected demographic variables with post test level of skill in the experimental group.

N=32

S.No.	Demographic variables	Post test Level of Skill score				Total	Chi square test
		Fair		Good			
		N	%	n	%		
1	Age yrs						$\chi^2=14.69$ P=0.01** Significant
	20-40	3	75.0	1	25.0	4	
	41-50	1	7.7	12	92.3	13	
	51-60	1	6.7	14	93.3	15	
2	Educational status						$\chi^2=14.07$ P=0.01** Significant
	Non- literate	2	100.0	0	0.0	2	
	Primary School	2	28.6	5	71.4	7	
	Middle school	1	5.6	17	94.4	18	
	High school	0	0.0	3	100.0	3	
	Higher school	0	0.0	2	100.0	2	
3	Family history of CAD						$\chi^2=9.37$ P=0.01** Significant
	Yes	0	0.0	17	100.0	17	
	No	5	33.3	10	66.7	15	
4	Any habit of smoking						$\chi^2=3.84$ P=0.05* Significant
	Yes	4	30.7	9	69.3	13	
	No	1	5.2	18	94.8	19	

* Significant at $p \leq 0.05$, ** Highly significant at $p \leq 0.01$, *** Very highly significant at $p \leq 0.001$, N.S = not significant

The above table shows the association between the post test level of skill and selected demographic variables of the experimental group such as age, education, family history of CAD and habit of smoking.

Age and education showed mild statistical significance and family history of CAD and habit of smoking showed high statistical significance. This indicates that clients aged between 51 – 60 yrs, those with middle school education, having family history of CAD and non- smokers showed higher improvement in their post test level of skill regarding prevention of CAD in comparison to the other samples.

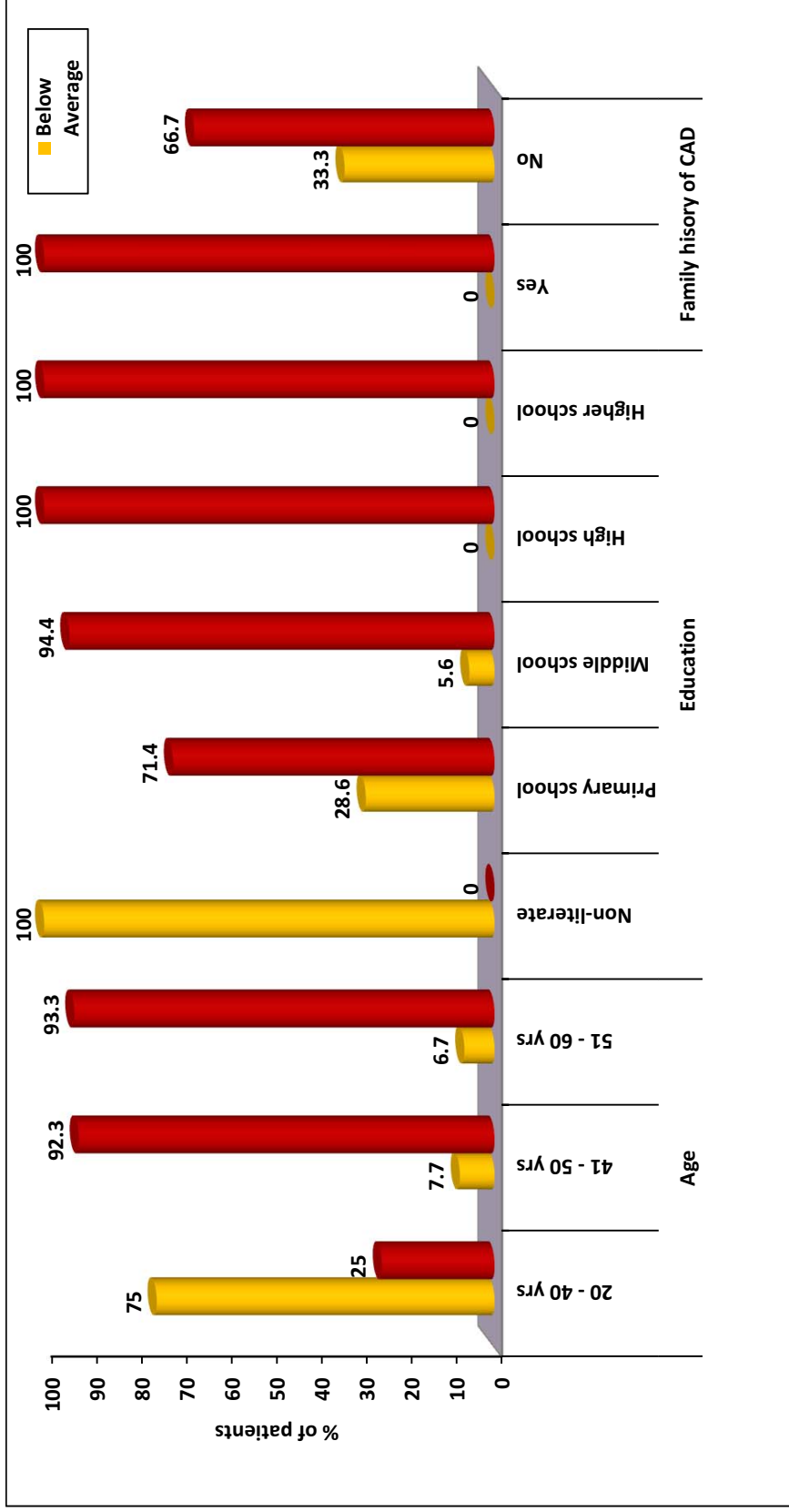


Figure 4.6.2: Association of selected demographic variables with post test level of skill in the experimental group

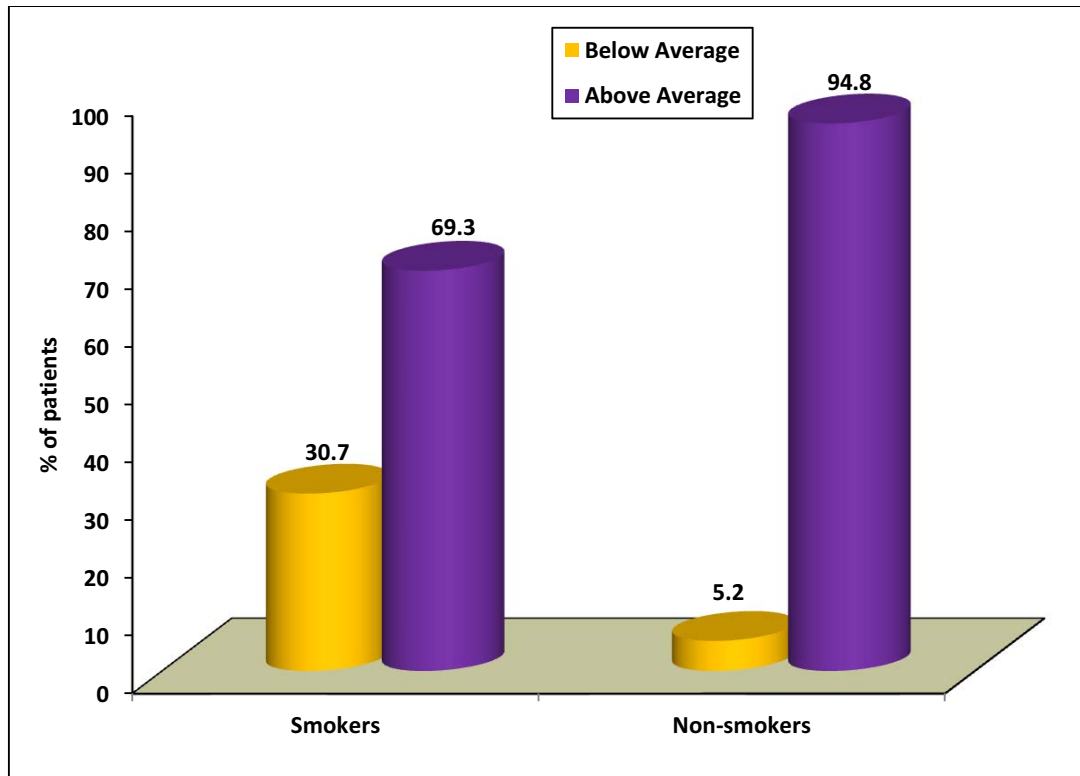


Figure 4.6.2: Association of selected demographic variables with post test level of skill in the experimental group

DISCUSSION

This chapter discusses the findings of the study, based on the objectives. The current study was undertaken to assess the effectiveness of Heart Smart Package on knowledge and skill regarding prevention of coronary artery disease among at risk clients, at selected hospitals, Andhra Pradesh.

5.1 The findings of the demographic and biological variables among at risk clients in the experimental and control group.

The demographic variables of at risk clients considered in this study was age in years, gender, education, occupation, type of family, area of residence, religion, family history of CAD, nature of relationship with affected person, presence of co- morbid illness, diet pattern, habit of smoking and biological variables of at risk clients such as height, weight, BMI and fasting blood glucose level.

In the experimental and control group most of the clients were aged between 51 – 60 yrs, had completed middle school education, were semi skilled workers, were married, belonged to Hindu religion and residing in urban areas. Equal number of male and female were present in the both the groups.

In the experimental group most of the samples belonged to nuclear family with a family monthly income of Rs. 13495 – 17999 and more than half of the samples had a family history of CAD. Out of which, most of them were afflicted with paternal relationship and had a history of diabetes and HTN as a co - morbid illness.

In the control group, most of the samples belonged to joint family, with a family monthly income of Rs.13495 – 17999, no family history of CAD and had a history of HTN as a co – morbid illness. Among those with family history of CAD, most of them were afflicted through paternal relationship.

With regard to biological variables the height of most of the samples as between 156 – 165 cm, weight between 61 – 70 kgs, BMI between 18 – 24 and FBS between 101 – 200 mg/dl in both groups.

Latheef SA, Subramanav. G (2011) conducted a study on prevalence of CAD and coronary risk factors in an urban population of tirupathi, reported that females had high danger of creating CAD and distinguished certain risk factors for CAD which incorporates hypertension, low LDL values, family history of CAD. Rea TD et al (2010) Huxley and Wood (2012) reported that there is a causal association between cigarette smoking and coronary illness. Individual who expend more than 20 cig/day by day have 2 to 3 fold in danger for getting coronary illness and intermittent heart attacks.

Frank.B, Walter C., (2010) conducted a prospective study on optimal diet for prevention of CHD, which found that bottomless utilization of fruits , vegetables, unsaturated fat and sufficient omega - 3 unsaturated fats can protect against CHD. Howard BV, Rodriguez BL, Bemett PH, Haris MI, Haman R and Kuller LH (2009) suggested that patient with Diabetes mellitus are 2 – 8 times more likely to experience future CVD. Shah et al (2009) distinguished history of 40 yrs of depression and history of endeavored suicide are significant autonomous indicators of premature CVD and IHD in both males and females.

5.2 The first objective was to assessment of the level of risk for developing CAD in the experimental and control group.

Frequency and percentage distribution of level of risk in the experimental and control group, shows that in both groups majority of clients had low risk for CAD. None of them had high risk in both groups.

Risk assessment guidelines (2013) by American College of Cardiology (ACC) and AHA released updated risk assessment rules. The most grounded indicators of 10-year risk identified were age, sex, race, total cholesterol, HDL, BP, BP with treatment, DM and smoking.

5.3 The second objective was to assessment of the effectiveness of Heart Smart Package on the level of knowledge regarding prevention of CAD among at risk clients.

The pretest level of knowledge regarding prevention of CAD among at risk patients in the experimental group, showed that majority of clients had inadequate knowledge

The post test level of knowledge regarding prevention of coronary artery disease among at risk clients in the experimental group, showed that majority of clients had adequate knowledge.

Comparison of pretest and post test knowledge scores regarding prevention of CAD among experimental and control group, the calculated paired 't' test value of 21.33 shows very high statistical significance at $p \leq 0.001$ among experimental group and the calculated paired 't' test value of 1.03 indicates no statistical significance among control group.

It indicates that both groups were homogenous in the pre test but after the administration of HSP, the experimental group showed significant improvement in the overall level of knowledge regarding prevention CAD.

Mamta Chowdhary, Kapil Sharma, Jaspreet, and Kaur Sodhi (2014) conducted an experimental study on level of knowledge in regards to preventive measures of CAD among patient going to outpatient department of selected hospital, the outcomes uncovered that just 15.33% had satisfactory knowledge and 84.67% had poor level of knowledge with respect to anticipation of CAD, the study suggests the need of awareness regarding preventive measures of CAD to diminish the burden of such devastating illness.

Comparison of post test knowledge scores regarding prevention of CAD between experimental and control group, showed that the unpaired 't' value 9.40 shows high statistical significance at $p < 0.001$ level.

The results showed that Heart Smart Package is effective in improving in level of knowledge regarding prevention of coronary artery disease among at risk clients in the experimental than the control group.

Hence the null hypothesis NH_1 stated that **“There is no significant effectiveness of Heart Smart Package on the level of knowledge regarding prevention of CAD among at risk clients rejected for experimental group and accepted for control group.**

5.4. Third objective was to assessment of the post test level of skill regarding prevention of CAD among the experimental group.

With regard to post test level of skill majority of them gained good skill in experimental group.

It shows effectiveness of Heart Smart Package and demonstration of exercises by investigator among experimental group.

Gerhard Schuler, Volter Adams and Yoichi Goto (2013) conducted a study on role of exercise in prevention of CVD reported that 15 min use of regular exercise, was associated with significant reduction in the risk of CVD.

5.5. Fourth objective Correlation of the post test level of knowledge with skill regarding prevention of cad in the experimental group among at risk clients.

Correlation between post test knowledge and skill score regarding prevention of CAD among at risk clients in the experimental group shows 'r' value 0.56 indicates moderate positive correlation signifying that an improvement in knowledge has a positive influence on increasing the skill among at risk clients.

Abinav Vaidya, Umesh Raj, Aryal, and Alexandra Karettek (2013) conducted a cross sectional study among 777 samples using random sampling technique to assess the knowledge, attitude and practice on CV health in urban community of Nepal. with a structured questionnaire. Results revealed that most of them were reported with adequate knowledge, attitude and good skill. The researcher concluded that as the knowledge increase, the practice also increasing 6.9% to 13.4%.

A cross sectional studies by (Dr. Jhon Botomwito Ikombele.,2011 and Kiberenge W.M 2010) on knowledge, attitude and practice regarding prevention of CAD among DM patients attending Mamelodi Hospital, Pretoria, Gauteng. positive correlation were found for the knowledge (0.171) and practice ($r=0.037$) where as frail positive non significant correlation observed between knowledge and practices.

Thus the null hypothesis NH_2 that was stated before **“There is no significant relationship between the post test level of knowledge and skill in the experimental group”**. It was rejected in the experimental group.

5.6. The fifth objective was to assessment of association of the selected demographic variables with the mean differed knowledge and post test skill score regarding prevention of CAD in the experimental group among at risk clients.

Age and education showed mild statistical significance, whereas family history of CAD and the habit of smoking showed high statistical significance. This indicates that there was significant improvement in their level of knowledge and post test level of skill regarding prevention of CAD among client aged between 51 – 60 yrs, those with middle school education, having family history of CAD and non- smokers, in comparison to the other samples.

Abinav Vaidya et.AI, (2013) explained association of the selected demographic variables like age and education with the knowledge, attitude and practice on in regards to counteractive action of CVD.

Thus the NH_3 stated before that **“There is no significant association of selected demographic variables with the post test level of knowledge and skill in the experimental group”** was rejected for the selected demographic variables such as age, education, history of CAD and non-smokers with mean differed level of knowledge and skill was improved regarding prevention of CAD in the experimental group.

SUMMARY, CONCLUSION, IMPLICATION, RECOMMENDATIONS AND LIMITATIONS

This chapter represents the summary, conclusion, implications, recommendations and limitations of the study.

6.1 SUMMARY

CAD is a plaque formation within the walls of the coronary arteries until the blood flow to the heart's muscle is limited. Otherwise called as Ischemia heart disease. It may be a chronic narrowing of coronary artery over time and limiting of the blood supply to part of the muscle. Or it can be acute, resulting from a sudden rupture of a plaque and formation of a thrombus or blood clot. Risk factors for CAD were categorized into modifiable and non-modifiable. Age, family history of CAD, gender (non-modifiable factors). Systolic hypertension, high total cholesterol, high LDL, low HDL, obesity, and stress (modifiable risk factors). Risk factor modification through healthy eating, regular exercises, cessation of smoking and alcohol, management of comorbid illness and maintaining optimum health can reduce clinical events and premature death in people with established CAD as well as in those who are at high risk for CAD due to one or more risk factors.

The Heart Smart Package booklet provides an overall knowledge and skill regarding prevention of CAD to at risk clients, there by empowering people to manage their risk factors independently.

The purpose of the study was to create awareness among at risk clients attending chronic outpatient clinics. "India has the dubious distinction of being known as the "coronary and diabetes capital of the world," said **Prof. Prakash Deedwania**, University of California, San Francisco, USA. (**Indian Heart Watch 2012**)

The objectives of study were

1. To assess the existing level of risk for CAD among the experimental and control group.

2. To assess the effectiveness of Heart Smart Package on the level of knowledge regarding prevention of CAD in the experimental and control group.
3. To assess the post test level of skill regarding prevention of CAD among the experimental group
4. To correlate the post test level of knowledge with skill regarding prevention of CAD in the experimental group.
5. To associate the selected demographic variables with the mean differed knowledge and post test skill score regarding prevention of CAD in the experimental group.

The study was based on assumptions that

- At risk clients may have some knowledge regarding risk for cardiovascular disease.
- Educating at risk clients about Heart Smart Package may enhance their knowledge and skill regarding cardiovascular health promotion.

The null hypotheses formulated were

NH₁- There is no significant effect of Heart Smart Package on the level of knowledge regarding prevention of CAD between the experimental and control group.

NH₂. There is no significant relationship between the post test level of knowledge and skill regarding prevention of CAD in the experimental group

NH₃- There is no significant association of selected demographic variables with the post test level of knowledge and skill regarding prevention of CAD in the experimental group

The review of literature, practical experience and expert's guidance provided strong support for the study. The reviews were developed a basis for conceptual framework, aided to design the methodology and formulation of the tool.

In view of explaining and relating various aspects, the investigator had adopted the concepts of Wiedenbach's Helping Art Of Clinical Nursing Theory and J.W.Kenny's Open System Model.

The investigator adopted a quasi experimental, non-equivalent control group pre test and post test design to assess the effectiveness of Heart Smart Package on knowledge and skill regarding prevention of coronary artery disease among at risk clients attending chronic outpatient clinics. 62 samples were selected using non probability purposive sampling technique.

The tool constructed had 2 parts. **Data collection tool**, which consisted of 5 parts. Part I consisted of Framingham Cardiovascular risk assessment tool, which comprised of age, total cholesterol, HDL, smokers, non- smokers and systolic hypertension. Part II consisted of, structured questionnaire to assess the demographic and biological variables. Part III consisted of structured interview schedule to assess the level of knowledge regarding CAD among at risk clients (25 questions). Part IV consisted of observational checklist to assess the skill performance by risk clients. This consists of 20 items. The scoring given is 1 mark for “Yes” and 0 mark for “No”. The total score is 20 marks.

The tool-II consisted of **interventional tool** (Heart Smart Package) prepared by the investigator is including : Lecture cum discussion aided by power point presentation for 5-7 members for about 30 min duration on, a) General information- Meaning of CAD, risk factors, causes, warning signs, and complications of CAD. b) Strategies for risk reduction- Healthy diet, regular exercises, cessation of smoking and alcohol, management of co-morbid illness and monitoring optimum health. c) Demonstration of cardio exercises by the investigator on warm-up, twist crunch, squat and over head press, static lunge, deep breathing exercises and cool down exercises to be performed for 3 min each, for a total duration of 20 min, once daily. d) Re-demonstration of the cardio exercises by at risk clients. e) Re-inforcement of prevention of CAD through booklet.

The content validity of the data collection tool was obtained from 1 cardiologist, 4 Medical-Surgical Nursing experts and 1 Physiotherapist. The reliability of the tool was established by inter rater method for knowledge questionnaire and observational check list. The feasibility and practicability of the study was analyzed by conducting a pilot study on 10 samples at RUSH Multi Specialty Hospital Tirupathi, Andhra Pradesh, India.

The data collection for the main study was also at done at RUSH Multi Specialty Hospital, Block-I and Block-II. purposive sampling technique was used and the sample

size was 64 clients who fulfilled the sample selection criteria. Ethical principles were adhered throughout the study.

The data collected was analyzed and interpreted based on the objectives and null hypotheses using descriptive and inferential statistics. The findings revealed that there was a significant improvement in the level of knowledge and skill after being provided with the Heart Smart package.

The major findings of the study were as follows

The analysis regarding level of risk of developing CAD in experimental group, revealed that 23(71.9%) had low risk, 9 (28.1%) had moderate risk and none (0%) had high risk whereas in the control group, 24(75.0%) had low risk, 8 (25.0%) had moderate risk and 0(0%) had high risk.

The pre test analysis of knowledge among at risk clients revealed that in the experimental group, majority 29(90.6%) had inadequate knowledge regarding prevention of CAD whereas in the post test it improved to 22(68.7%) gaining adequate knowledge and 10(31.3%) moderately adequate knowledge. In the control group, majority 28(87.5%) had inadequate knowledge in the pretest while in the post test it remained similar with 27(84.4%) having inadequate knowledge.

The analysis of effectiveness of Heart Smart Package on knowledge and skill among at clients showed that, both the calculated paired 't' value of 21.3 and the unpaired 't' value of $t = 9.40$ was found to be highly statistically significant at $p < 0.001$ level. This clearly indicates that the Heart Smart Package regarding prevention of CAD administered to the risk clients in the experimental group had impacted a significant improvement in their level of knowledge than the control group.

The analysis of post skill among the experimental group, showed that 5 (15.6%) had fair skill and 27 (84.4%) had good skill following the administration of HSP.

The correlation between knowledge and skill in the experimental group, revealed the calculated Karl Pearson's correlation coefficient value of $r = 0.56$, which indicates moderate positive correlation and high statistical significance at $p < 0.00$ level. This

clearly indicates that when the level of knowledge increased following the administration HSP, it enabled the experimental group to gain adequate skill in performing the cardio exercises.

A statistically high significant level of association ($p < 0.001$ level) was identified between the demographic variables age, education, family history of CAD and non-smokers and the level of knowledge and skill gained by the experimental group, this indicated that these aged 51-60 yrs, having completed middle school education with family history of CAD and non- smokers showed greater interest in knowing about prevention of CAD than the other samples.

6.2 CONCLUSION

The current study assessed the effectiveness of Heart Smart package on knowledge and skill regarding prevention of coronary artery disease among at risk clients attending chronic outpatient departments at selected hospitals Andhra Pradesh.

The study revealed that in comparison to the control group, the experimental group showed a significant improvement in the level of knowledge and skill regarding prevention of CAD following the administration of Heart Smart Package, thereby concluding that the Heart Smart Package was effective in enabling the at risk clients to gain awareness and skill regarding prevention of CAD and managing their risk status.

6.3 IMPLICATIONS

The investigator has drawn the following implications from the study in the field of nursing practice, nursing education, nursing administration and nursing research.

6.3.1 Nursing Practice

Nurses have a vital role in educating the patients to improve their knowledge and skill in prevention of CAD.

This can be facilitated by motivating the nurses to:

- Utilize the findings of the study to plan regular periodic health for CAD related risk screenings and education sessions in hospitals and community health centers regarding CAD and its prevention.

- Implement mass educational program me on awareness of CAD using Heart Smart Package.
- Encourage the public to engage in health promotion and health screening camps to monitor for CAD related to risk.
- Perform a risk assessment using the Framingham Cardiovascular Disease Risk Assessment Tool and then based on results behavior and lifestyle modifications for those at risk are to be done.
- The chronic outpatient Department nurses can utilize this package in their daily routine of health teaching.
- Motivate nurses to develop skill in teaching patients to perform heart healthy/cardio exercises

6.3.2 Nursing Education

- The nurse educator can integrate the major study findings in the nursing curriculum at various levels to build up and train the students to identify risk clients using Framingham Cardiovascular Disease Risk Assessment Tool to prevent of CAD leading to other major life threatening conditions.
- The nurse educator may facilitate the student nurses to gain skill required to perform cardio exercises to educate at risk clients.
- The educational institutions must offer opportunities for the nursing students to gain exposure to training programmes on heart health and prevention and control of CAD related risk factors.

6.3.3 Nursing Administration

- Nurse administrator can play an extended role in counseling those who are at risk for developing CAD
- Nurse administrators can plan and implement a protocol for nurses to aid in enhancing the knowledge in prevention of CAD among at risk clients as a part of routine hospital care.
- Nurse administrators can plan for awareness programmes and reach-out to a larger group of population

6.3.4 Nursing Research

- The findings of the study can be disseminated to the nurses working in chronic outpatient department and student nurses through various media.
- The study plan can be further replication in various other settings and larger population.

6.4 RECOMMENDATIONS

- This particular intervention package and risk assessment tool has been utilized in
- Omayal Achi Community Health Centre in Arakambakkam, Thiruvallur District, Tamilnadu, during mega health camp. Hence it can be utilized similarly at other health centres also
- The nurse investigator encourages the use the HSP booklet by chronic outpatient department in RUSH multi specialty hospital allowing the communication of study findings to the Health Administrator.
- Chronic OPDs should be equipped with booklets for creating awareness among general population
- Similar study can be done in a larger population.
- Awareness programmes on CAD risk prevention could be conducted at community level.
- Mixed method study and comparison between rural and urban group could be done in larger population
- A similar study can be conducted on risk groups like sedentary workers, obese individuals etc to enhance their ability to manage the risk status.

6.5 LIMITATION

- Investigator found difficulty in getting setting permission.

6.6 PLAN FOR RESEARCH DISSEMINATION

- The research findings will be disseminated through Medical Surgical Nursing Journal, TNAI Journal and Health Action Journal and podium presentations both in National and International conferences.

6.7 PLAN FOR RESEARCH UTILIZATION

- The research findings will be incorporated in schools, colleges, work-sites, hospitals and health centers

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APPENDIX – I

CODING FOR DEMOGRAPHIC VARIABLES

DEMOGRAPHIC VARIABLES	CODE NO.
1. Age (years)	
a) 20-40	1
b) 41-50	2,
c) 51-60	3
d) 61-70	4
2. Gender	
a) Male	1
b) Female	2
3. Education	
a) Non- literate	1
b) Primary School certificate	2
c) Middle school certificate	3
d) High school certificate	4
e) Higher school certificate	5
4. Occupation	
a) Unemployed	1
b) Unskilled worker	2
c) Semi skilled workers	3
d) Skilled worker	4
e) Own business	
f) Professional	
5. Type of family	
a) Nuclear family	1
b) Joint family	2
c) Extended family	3
d) Separated family	4

6. Area of residence

- | | |
|----------------|---|
| a) Slum | 1 |
| b) Rural | 2 |
| c) Semi- rural | 3 |
| d) Urban | 4 |

7. Family monthly Income (in Rs)

- | | |
|----------------|---|
| a) <1802 | 1 |
| b) 1801-5386 | 2 |
| c) 5387-8988 | 3 |
| d) 8989-13494 | 4 |
| e) 13495-17999 | 5 |
| f) 18000-36016 | 6 |
| g) >36017 | 7 |

8. Religion

- | | |
|--------------|---|
| a) Hindu | 1 |
| b) Muslim | 2 |
| c) Christian | 3 |
| d) Others | 4 |

9. Marital status

- | | |
|--------------|---|
| a) Married | 1 |
| b) Unmarried | 2 |

10. Family history of CAD

- | | |
|--------|---|
| a) Yes | 1 |
| b) No | 2 |

11. If yes, nature of the relationship with affected person

- | | |
|-------------|---|
| a) Paternal | 1 |
| b) Maternal | 2 |
| c) Siblings | 3 |
| d) Others | 4 |

12. History of co-morbid illness

- | | |
|-----------------|---|
| a) Hypertension | 1 |
| b) Diabetes | 2 |
| c) Both | 3 |
| d) Others | 4 |

13. Dietary pattern

- | | |
|-------------------|---|
| a) Vegetarian | 1 |
| b) Non-vegetarian | 2 |

14. Any recent information /participation in cardiac health promotion activity

- | | |
|--------|---|
| a) Yes | 1 |
| b) No | 2 |

15. If yes, specify the source

- | | |
|---------------|---|
| a) News paper | 1 |
| b) internet | 2 |
| c) Posters | 3 |
| d) Others | 4 |

16. Any habit of smoking?

- | | |
|--------|---|
| a. Yes | 1 |
| b. No | 2 |

17. If yes, how many cigarettes per day?

- | | |
|---------------|---|
| a. <1 pack | 1 |
| b. 1- 2 packs | 2 |
| c. > 2 packs | 3 |

2. BIOLOGICAL VARIABLES

18. Height (cm)

a) 145-155	1
b) 156-165	2
c) 166-175	3

19. Weight (kg)

a) <50	1
b) 51-60	2
c) 61-70	3
d) >70	4

18. BMI (kg/m^2)

a) <18	1
b) 18-24	2
c) >24	3

21. Fasting blood sugar level (mg/dl)

a) <70	1
b) 71-100	2
c) 101-200	3
d) 201-300	4
e) > 300	5

APPENDIX – J**BLUE PRINT**

S. no	Content	Item	Total items	Percentage
1	Framingham Cardiovascular Disease Risk Assessment Tool	1 – 6	6	100%
2	Background variables	1 – 21	21	100%
3	Structured interview schedule	1 – 8		36%
	<ul style="list-style-type: none"> • General information • Prevention strategies for CAD risk factors 	9 – 17	25	64%
	Total	1 – 25	25	100%
4	Observational check list	1 – 20	20	100%

APPENDIX – K

HEART SMART PACKAGE

- Lecture cum discussion regarding prevention of CVDD
- Demonstration on cardio exercises
- Booklet on prevention on CAD

LESSON PLAN ON HEART SMART PACKAGE FOR PREVENTION OF HERT DISEASE


Topic	:	Heart Smart Package (HSP) for prevention of coronary artery disease (CAD)
Group	:	Clients at risk for CAD
Place	:	RUSH Multispecialty Hospital
Duration	:	30-45 minutes
Teaching method	:	Lecture cum discussion
Instructor	:	Investigator
Instructional Aids	:	Power point presentation, Booklet
Seating arrangement	:	Theatre method

GENERAL OBJECTIVE : At the end of the health education the clients will gain adequate knowledge and skill regarding Heart Smart Package for prevention of CAD

SPECIFIC OBJECTIVES : At the end of the health education the client will able to


- state the meaning of CAD
- specify the incidence of CAD
- enlist the risk factors and causes CAD
- explain the pathophysiology of CAD
- denote the clinical manifestations of CAD
- discuss the Heart Smart Package for prevention of CAD.
- enlist the complications of CAD

TIME	SPECIFIC OBJECTIVES	CONTENT	A.V AIDS	INVESTIGATOR-LEARNER ACTIVITY	EVALUATION				
2min	Introducing the topic	<p>1.Introduction Coronary Artery Disease is the most common form of heart disease which affects the mainly the heart ,by deposition of fat in the arteries there by reducing blood flow.</p>	PPT	Investigator introduces the topic ,learners are listen					
1min	state the meaning of CAD	<p>1.1 Meaning Coronary artery disease (CAD) is a narrowing of the small blood vessels that supply blood and oxygen to the heart caused by accumulation of fatty substances on the walls of the arteries.</p>	PPT	Investigator state the meaning, learner listens	State the meaning of CAD				
1min	specify the incidence of the CAD	<p>1.2 Incidence Globally -17.3 million deaths due to CAD, Each year, approximately 3.8 million men, 3.4 million women died from CAD. India -WHO estimates that 1.03% billion cases are prevalent in India Tamilnadu -36% of heart attack cases are due to CAD Age -CAD is higher in the age group of 35-65 years Gender -CAD is more among men than women due smoking and alcohol</p>	PPT	Investigator specify the incidence ,learner listen	Specify the incidence of CAD				
2min	enlist the risk factors	<table border="1" data-bbox="993 730 1351 1654"> <thead> <tr> <th data-bbox="993 1243 1068 1654">1.3Non- Modifiable risk factors</th> <th data-bbox="993 823 1068 1243">1.3Modifiable risk factors</th> </tr> </thead> <tbody> <tr> <td data-bbox="1068 1243 1351 1654"> 1.Age 2.Gender 3.Family history 4.Genetic predisposition </td> <td data-bbox="1068 823 1351 1243"> MAJOR: 1.Elevated triglycerides and LDL 2.Decreased HDL 3.Systolic blood pressure >140/90 4.Tobacco use 5.Alcohol use 6.Physical inactivity 7.Obesity- waist circumference >102 cm or 39.8 inches in women </td> </tr> </tbody> </table>	1.3Non- Modifiable risk factors	1.3Modifiable risk factors	1.Age 2.Gender 3.Family history 4.Genetic predisposition	MAJOR: 1.Elevated triglycerides and LDL 2.Decreased HDL 3.Systolic blood pressure >140/90 4.Tobacco use 5.Alcohol use 6.Physical inactivity 7.Obesity- waist circumference >102 cm or 39.8 inches in women	PPT	Investigator lists the risk factors ,learner listen	What are the risk factors
1.3Non- Modifiable risk factors	1.3Modifiable risk factors								
1.Age 2.Gender 3.Family history 4.Genetic predisposition	MAJOR: 1.Elevated triglycerides and LDL 2.Decreased HDL 3.Systolic blood pressure >140/90 4.Tobacco use 5.Alcohol use 6.Physical inactivity 7.Obesity- waist circumference >102 cm or 39.8 inches in women								

2min	explain the pathophysiology of CAD	<p>9. BMI > 30 kg/m² CONTRIBUTING: 1. Blood sugar levels > 120 mg/dl 2. Psychological stress</p>	<p>1.4 Pathophysiology Consumption of high fat food cause ↓ ↓ The accumulation of fatty flakes inside the arteries of heart ↓ ↓ Because of this accumulation of fatty streaks reduce the blood flow to the heart muscles ↓ ↓ Due to less blood supply to the heart, individuals may get the chest pain</p>	PPT	Investigator explain the pathophysiology, learner listen	Explain pathophysiology
3min	denote the clinical manifestations	<p>1.5 Clinical Manifestations</p> <ul style="list-style-type: none"> • Retrosternal chest pain \ chest heaviness • Nausea and vomiting • Dizziness • Lightheadedness • fainting 	PPT	Investigator denotes warning sign and learner listen	Denote the warning signs	

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1min	enlist the complications of CAD	<p>1.6 Complications</p> <ul style="list-style-type: none"> • Clots in blood vessels of legs • Ischemic stroke • Angina • Cardiac death 	PPT	Investigator discuss the Complications ,learner listen	enlist the complications
15 min	discuss the HSP for prevention of CAD	<p>2.Heart Smart Package for prevention of CAD</p> <p>Goal:</p> <ul style="list-style-type: none"> • To maintain healthy weight • To reduce the excess cholesterol • To prevent the CAD. <p>2.1 DIET</p> <p><u>Recommendations for improving HDL lipid levels</u></p> <ul style="list-style-type: none"> • HDL is good cholesterol whereas LDL is bad cholesterol to the body <div data-bbox="828 987 1071 1386" style="text-align: center;"> </div> <ul style="list-style-type: none"> • Excess weight increases blood cholesterol, triglycerides and blood pressure and lowers HDL cholesterol. • It also increases your risk of diabetes. • Fat concentrated in your abdomen puts you at greater cardiovascular risk than extra fat concentration in the arms and legs. • Waist measurements for women should be less than 35 inches. Men should aim for a waist less than 40 inches 	PPT	Investigator discuss the HSP strategies ,learner listen	discuss the strategies to reduce the risk of CAD

	<ul style="list-style-type: none"> • Eat at least five to seven servings of vegetables and fruits daily • Eat soya products and legumes daily- it decreases the cholesterol level • Increase the intake of garlic- it reduces the cholesterol level • Take soluble fiber - it increases the excretion of bile and cholesterol • Reduce intake of salt and hypertensive clients have to take salt 1/2 teaspoon/day according to WHO • Limit/avoid trans fat diet such as egg yolk, Meat, Butter chicken/butter fried fish, Milk fat – full cream milk, Hidden fat- biscuits and cakes. 	
		
	<p>Cooking oils</p> <ul style="list-style-type: none"> • Increase intake of polyunsaturated oils-ground nut oil, olive oil • Omega 3 fatty acids reduces triglycerides-fish oil, marine fish, salmon fish 	




2.2 Exercise


Recommendations

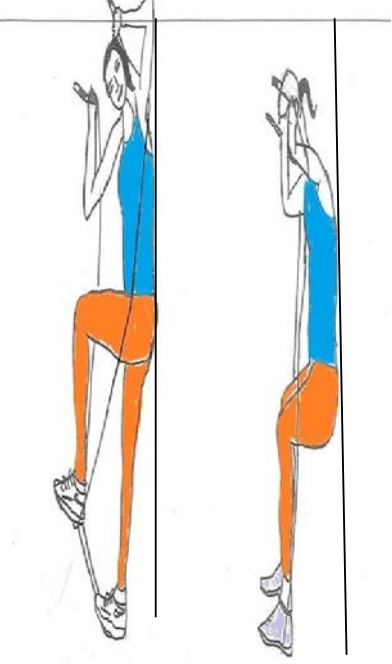
- 30 minutes of moderate-intensity physical activity, such as brisk walking, five days a week.
- 20 minutes of vigorous aerobic activity, such as jogging, three days a week.
- Light exercise as part of your daily routine. Take the stairs and walk around garden

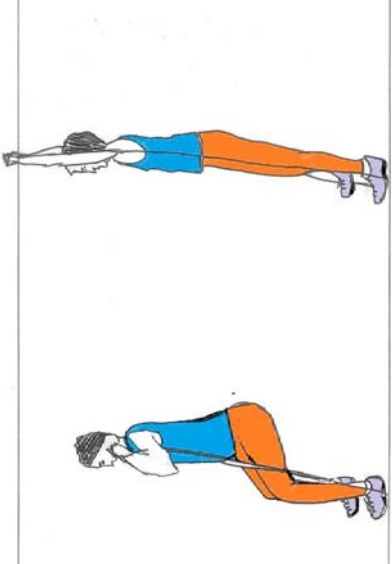
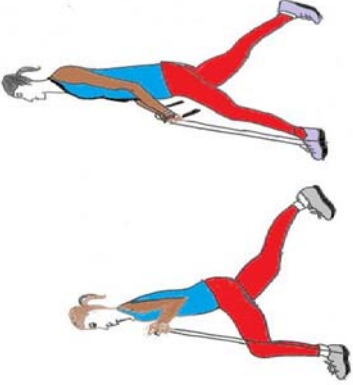
Which includes


- I. Deep breathing exercises
- II. Weight reducing exercises
 - ✓ Warm up phase
 - ✓ Enduration phase
 - ✓ Cool down phase

		<p>Deep breathing exercises</p>  <p>Through the deep breathing exercises it improves the blood circulation to the heart</p> <ul style="list-style-type: none"> • sit in a comfortable chair, maintaining good posture. Your body should be as relaxed as possible. Close your eyes. Scan your body for tension. • Pay attention to your breathing. Place one hand on the part of your chest or abdomen that seems to rise and fall the most with each breath. If this spot is in your chest you are not utilizing the lower part of your lungs. • Place both hands on your abdomen and follow your breathing, noticing how your abdomen rises and falls. • Breathe through your nose. • Notice if your chest is moving in harmony with your abdomen. • Now place one hand on your abdomen and one on your chest. 			
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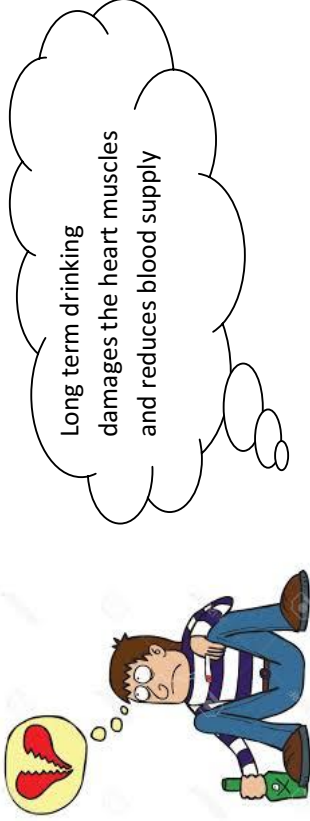
	<ul style="list-style-type: none"> • Inhale deeply and slowly through your nose into your abdomen. You should feel your abdomen rise with this inhalation and your chest should move only a little. • Exhale through your mouth, keeping your mouth, tongue, and jaw relaxed. • Relax as you focus on the sound and feeling of long, slow, deep breaths. <p>A. Warm up phase</p> <ul style="list-style-type: none"> • Warm up for 5 min to improve the blood circulation stretch the muscles • Cool down exercises are to decrease heart rate <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: left;"> <p>Before</p> <ul style="list-style-type: none"> • Include 5 minute warm up • Check blood sugar </div> <div style="text-align: center;">  </div> <div style="text-align: right;"> <p>After</p> <ul style="list-style-type: none"> • Include 5 minute cool down • Check blood sugar </div> </div> <p>Those are</p> <ul style="list-style-type: none"> • Neck movements –flexion, extension and rotation of neck • Hand movements- flexion, extension and rotation of hand • Leg movements -flexion, extension and rotation of leg • Trunk movements-flexion, extension and rotation of trunk <p>B. Enduration phase/condition phase</p>			
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	<p>Weight reducing exercise</p> <ul style="list-style-type: none"> • The twist crunch This will tone the obliques and core. Lie on your back. Put the rope under your feet and hold on to the handles. Keep your shoulders off the floor. Bring your right elbow and left knee up to meet in a twisting motion and then repeat on the other side. 		
	<ul style="list-style-type: none"> • Squat and over head press Keep your feet hip-width apart with the rope under your feet. Hold on to the handles and bring your hands to shoulder-height, while bending your knees to the squat position. Stand up out of the squat position and stretch your arms above your head. Keep the elbow flexed. 		

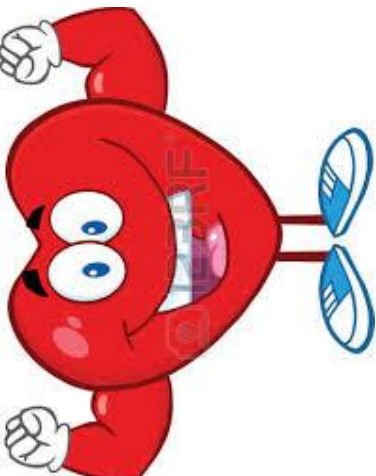
	 <ul style="list-style-type: none">• Static lunge and bicep curl Put the rope under your front foot and lift your back heel. Put your hands by your side while holding the rope handles. Keep your palms up. Bend both knees equally to a 90 degree angle while pulling the palms towards the shoulders. Keep the elbows fixed by your side			
	 <p>C. Cool down phase</p>			

	<p>Arm stretch Trunk stretch Leg stretch</p> <p>2.3 Cessation of smoking and alcohol</p> <ul style="list-style-type: none"> • Smoking may increase the blood pressure and damage the blood vessels. • Cigarette smoke contains more than 4000 chemicals and 200 of those chemical are poisonous  <p>Start your stop smoking plan with START</p> <p>S = Set a quit date.</p> <p>Choose a date within the next 2 weeks, so you have enough time to prepare without losing your motivation to quit. If you mainly smoke at work, quit on the weekend, so you have a few days to adjust to the change.</p> <p>T = Tell family, friends, and co-workers that you plan to quit.</p> <p>Let your friends and family know your plan to quit smoking and tell them you</p>			
--	--	--	--	--

		<p>need their support and encouragement to stop.</p> <p>A = Anticipate and plan for the challenges you'll face while quitting.</p> <p>Most people who begin smoking again do so within the first 3 months. You can help yourself make it through by preparing ahead for common challenges, such as nicotine withdrawal and cigarette cravings.</p> <p>R = Remove cigarettes and other tobacco products from your home car, and work</p> <p>Throw away all of your cigarettes (no emergency pack!), lighters, ashtrays, and matches. Wash your clothes and freshen up anything that smells like smoke.</p> <p>T = Talk to your doctor about getting help to quit.</p> <p>Your doctor can prescribe medication to help with withdrawal and suggest other alternatives.</p> <p>Stop alcohol consumption</p>		
--	--	--	--	--

	 <p>2.4 Managing co-morbid illness</p> <p>I. Control your blood sugar levels</p> <ul style="list-style-type: none"> • Controlling diabetes is essential for reducing your risk of CAD, because diabetes is a major independent risk factor for cardiovascular disease and raises the level of LDL and triglycerides, lowers HDL, and elevates blood pressure. • Keep the condition under control with diet, exercise, faithful monitoring of blood glucose and other measures recommended by the doctor monitoring you. <p>II. Controlling blood pressure levels:</p> <ul style="list-style-type: none"> • Adults should have their blood pressure checked at least once every 2 years • If you have high blood pressure practice laughter therapy, restrict salt diet ,walk daily, avoid stress ,eat healthy diet and avoid high fat foods <p>III. Medication adherence:</p> <ul style="list-style-type: none"> • If lifestyle changes and complementary treatments are not enough to prevent coronary artery disease, medication may be necessary. Drugs are used to treat high blood pressure, elevated cholesterol levels and certain contributing diseases such as diabetes. Always follow-up with 		
--	--	--	--

	<p>new prescriptions in high-risk patients</p> <p>2.5 Maintain the optimum health Regular follow up checkups:</p> <ul style="list-style-type: none"> • The regular checkups to prevent the immediate complications promptly. • Maintain a diary to note the fluctuation of B.P, blood sugar and cholesterol values. • Carry a medic alert card specifying your condition, medications and close family members contact number for use in any emergency situation • Monthly once at risk clients have to visit physician for further evaluation of health <p>Know your numbers</p> <p>Normal cholesterol levels</p> <table border="1" data-bbox="911 800 1265 1619"> <thead> <tr> <th>LDL Cholesterol Level</th> <th>LDL-Cholesterol Category</th> </tr> </thead> <tbody> <tr> <td>Less than 100 mg/dL</td> <td>Optimal</td> </tr> <tr> <td>160-189 mg/dL</td> <td>High</td> </tr> </tbody> </table> <table border="1" data-bbox="1089 911 1265 1619"> <thead> <tr> <th>Total Cholesterol Level</th> <th>Category</th> </tr> </thead> <tbody> <tr> <td>Less than 200 mg/dL</td> <td>Optimal</td> </tr> <tr> <td>240 mg/dL and above</td> <td>High</td> </tr> </tbody> </table> <p>Blood pressure:</p>	LDL Cholesterol Level	LDL-Cholesterol Category	Less than 100 mg/dL	Optimal	160-189 mg/dL	High	Total Cholesterol Level	Category	Less than 200 mg/dL	Optimal	240 mg/dL and above	High		
LDL Cholesterol Level	LDL-Cholesterol Category														
Less than 100 mg/dL	Optimal														
160-189 mg/dL	High														
Total Cholesterol Level	Category														
Less than 200 mg/dL	Optimal														
240 mg/dL and above	High														

Category		Systolic (top number)	Diastolic (bottom number)
Normal	120	And	80
High blood pressure	140-159		90-99
<p>TAKE HOME MESSAGE</p> <p>Play It Smart, Take Care of Your Heart</p>  <ul style="list-style-type: none"> • Diabetes, overweight, high blood pressure, rich meals, desserts, high waist measure, lack of physical activity, and poor nutrition will bring bad news from your physician. • Take action now to prevent disease, reduce the fat, STOP SMOKING, PLEASE! Keep lots of fruits and veggies on your table and when you shop, read the food label. • Turn off the TV and go for a walk. 			

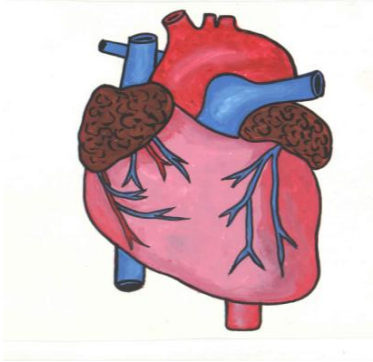
			<p>Go with a friend and enjoy a good talk. Plan for the future and increase your chances of attending your kids' graduations and dances</p> <ul style="list-style-type: none"> • Change your lifestyle now-Play it smart • Start living healthy, and guard your heart 		
--	--	--	--	--	--

Conclusion:

Heart disease is often avoidable. Following a heart healthy life style which doesn't have to be complicated, and it doesn't mean you need to live a life of self deprivation. Instead find ways to incorporate heart healthy habits in to your lifestyle and you may well enjoy a healthier life for years to come

**OMAYAL ACHI COLLEGE OF NURSING
PUZHAL**

PREVENTION OF CORONARY ARTERY DISEASE



HEALTHY HEART

HEALTHY PEOPLE

By

K. Gayathri

M.sc (N) II – Year

Medical Surgical Nursing

**THE DR.M.G.R MEDICAL UNIVERSITY
AS A PART OF THE PARTIAL FULFILMENT
OF M.SC NURSING**

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1.1	WHAT IS CORONARY ARTERY DISEASE	1
1.2	RISK FACTORS	1
1.3	CLINICAL MANIFESTATIONS	3
2	HEART SMART PACKAGE FOR PREVENTION OF CAD	3
2.1	DIET	3
2.2	MAINTAIN HEALTHY WEIGHT	4
2.3	CESSATION OF SMOKING AND ALCOHOL	6
2.4	MANAGEMENT OF CO-MORBID ILLNESS	8
2.5	MAINTAIN OPTIMUM HEALTH	9

1. GENERAL INFORMATION REGARDING CAD

1.1 MEANING

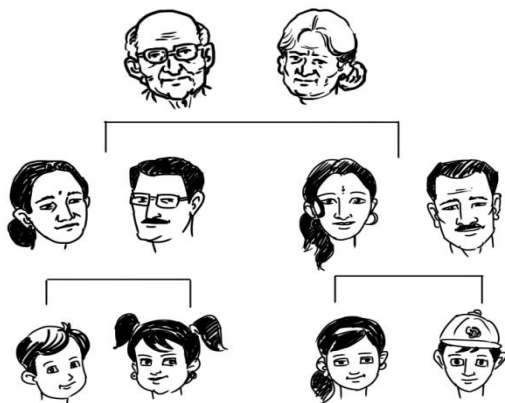
Coronary artery disease (CAD) is a narrowing of the small blood vessels that supply blood and oxygen to the heart caused by accumulation of fatty substances on the walls of the arteries.



1.2 RISK FACTORS

❖ Non- modifiable risk factors

- Family history



- Increasing Age



❖ Modifiable risk factors

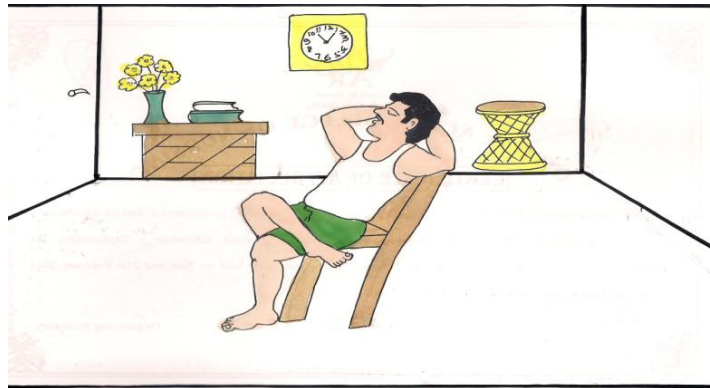
- Elevated triglycerides and LDL
- Decreased HDL
- Systolic blood pressure $>140/90$
- Tobacco use



- Alcohol



- Decreased physical activity



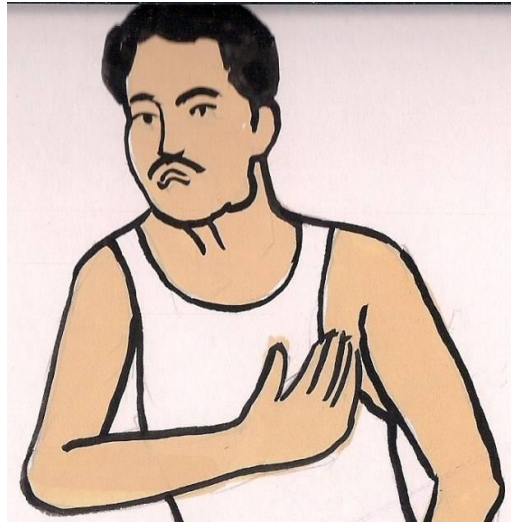
- Obesity



- Stress



1.3 Clinical manifestation of CAD



- Retrosternal chest pain/ chest heaviness.
- Chest discomfort
- Arm or back discomfort
- Neck and Jaw discomfort
- Trouble breathing, with or without chest discomfort
- Feeling sick or discomfort in your stomach
- Feeling light headed or breaking into a cold sweat.

1.4 Complications

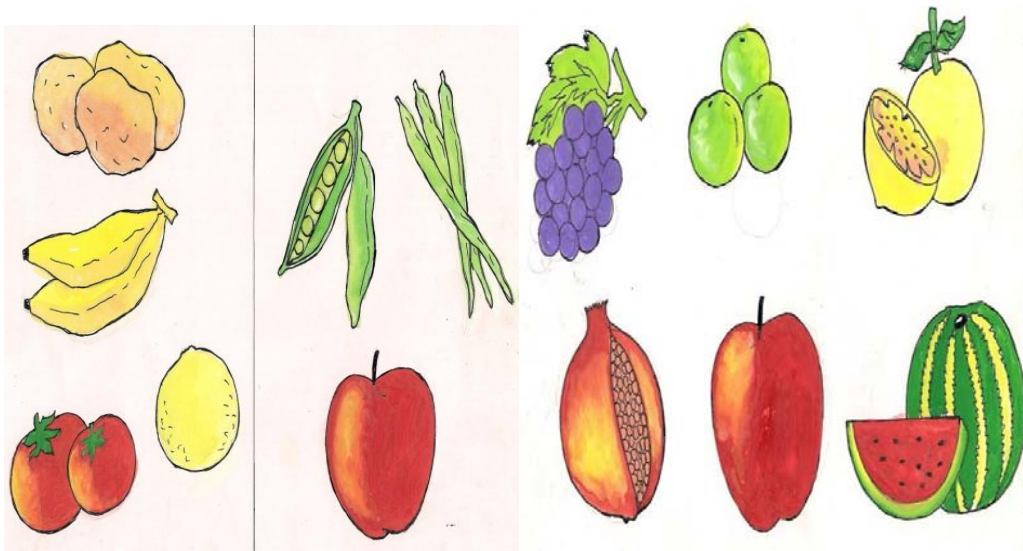
- Clots in blood vessels of legs
- Ischemic stroke
- Angina
- Cardiac death

2.2 Heart Smart Package for prevention of CAD

2.1 DIET

Recommendations for improving lipid levels

- Eat at least five to seven servings of vegetables and fruits daily
- Eat soya products and legumes daily- it decreases the cholesterol level
- Increase the intake of garlic- it reduces the cholesterol level
- Take soluble fiber - it increases the excretion of bile and cholesterol



- Reduce intake of salt – especially 1/2 teaspoon/day have to take by hypertension clients
- Limit/avoid trans fat diet such as egg yolk, Meat, Butter chicken/butter
- Increase intake of monounsaturated oils-ground nut oil, olive oil
- Omega 3 fatty acids reduces triglycerides-fish oil, marine fish,

2.2 Maintain healthy weight

- HDL is good cholesterol whereas LDL is bad cholesterol to the body
- Excess weight increases blood cholesterol, triglycerides, and blood

❖ Exercise regularly

Goal :

- It reduce the cholesterol level .
- It improve the blood circulation of Heart

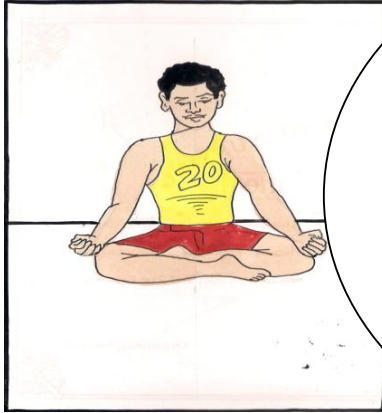
Recommendations for exercises

- 30 minutes of moderate-intensity physical activity, such as brisk walking, five days a week.
- 20 minutes of vigorous aerobic activity, such as jogging, three days a week.
- Light exercise as part of your daily routine. Take the stairs and walk around while on the phone.

Which includes :

- ✓ Deep breathing exercises
- ✓ Weight reducing exercises
 - Warm up phase
 - Enduration Phase
 - Cool down phase

✓ **Deep breathing exercises**



Through the deep breathing exercises it improves the blood circulation to the heart

- sit in a comfortable chair, maintaining good posture. Your body should be as relaxed as possible. Close your eyes. Scan your body for tension.
- Pay attention to your breathing. Place one hand on the part of your chest or abdomen that seems to rise and fall the most with each breath. If this spot is in your chest you are not utilizing the lower part of your lungs.
- Place both hands on your abdomen and follow your breathing, noticing how your abdomen rises and falls.
- Breathe through your nose.
- Notice if your chest is moving in harmony with your abdomen.
- Now place one hand on your abdomen and one on your chest.
- Inhale deeply and slowly through your nose into your abdomen. You should feel your abdomen rise with this inhalation and your chest should move only a little.

- Exhale through your mouth, keeping your mouth, tongue, and jaw relaxed.
- Relax as you focus on the sound and feeling of long, slow, deep breaths.

A. Warm up phase

- Warm up for 5 min to improve the blood circulation stretch the muscles

Those are

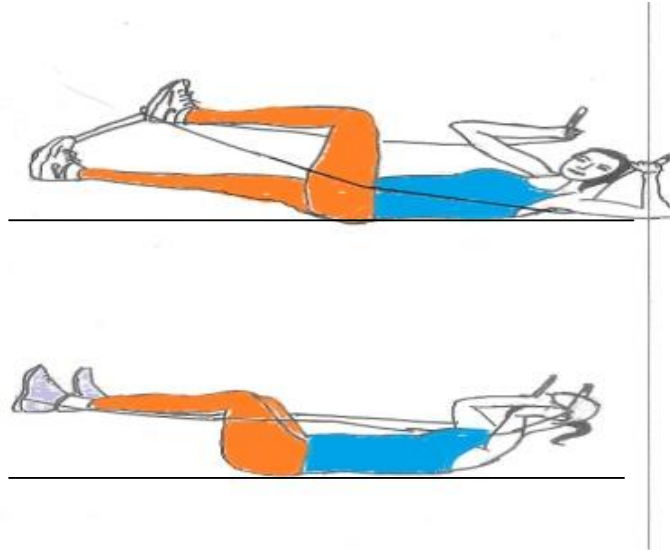
- Neck movements –flexion, extension and rotation of neck
- Hand movements- flexion, extension and rotation of hand
- Leg movements -flexion, extension and rotation of leg
- Trunk movements-flexion, extension and rotation of trunk

B. Endurance phase/condition phase

- ✓ The twist crunch
- ✓ Squat and over head press
- ✓ Static lunge and bicep curl

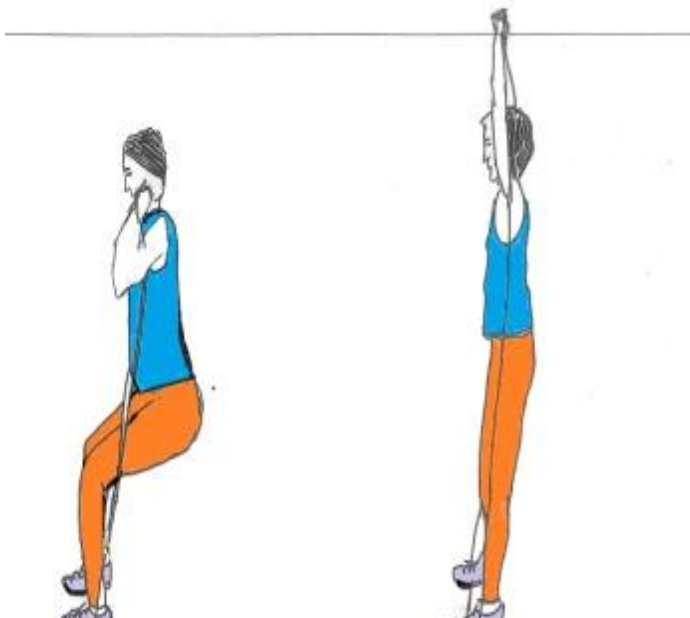
○ **The twist crunch**

This will tone the obliques and core.Lie on your back. Put the rope under your feet and hold on to the handles.keep your shoulders off the floor.bring your right elbow and left knee up to meet in atwisting motion and then repeat on the other side



- **Squat and over head press**

Keep your feet hip-width apart with the rope under your feet.hold on to the handles and bring your hands to shoulder-height,while bending your knees to the squat position . stand up out of the squat position and stretch your arms above your head . keep the elbow flexed.



- **Static lunge and bicep curl**

Put the rope under your front foot and lift your back heel. Put your hands by your side while holding the rope handles. Keep your palms up. Bend both knees equally to a 90 degree angle while pulling the palms towards the shoulders. Keep the elbows fixed by your side



C. Cool Down Phase

- Cool down exercises are to decrease heart rate
 - ✓ Arm stretch
 - ✓ Trunk stretch
 - ✓ Leg stretch

2.3 Cessation of smoking and alcohol

- Smoking may increase the blood pressure and damage the blood vessels.

- Cigarette smoke contains more than 4000 chemicals and 200 of those chemical are poisonous



**Stop
smoking**

Start your stop smoking plan with START

- **S = Set a quit date.**

Choose a date within the next 2 weeks, so you have enough time to prepare without losing your motivation to quit. If you mainly smoke at work, quit on the weekend, so you have a few days to adjust to the change.

- **T = Tell family, friends, and co-workers that you plan to quit.**

Let your friends and family know your plan to quit smoking and tell them you need their support and encouragement to stop.

- **A = Anticipate and plan for the challenges you'll face while quitting.**

Most people who begin smoking again do so within the first 3 months. You can help yourself make it through by preparing ahead for common challenges, such as nicotine withdrawal and cigarette cravings.

- **R = Remove cigarettes and other tobacco products from your home car, and work**

Throw away all of your cigarettes (no emergency pack!), lighters, ashtrays, and matches. Wash your clothes and freshen up anything that smells like smoke.

- **T = Talk to your doctor about getting help to quit.**

Your doctor can prescribe medication to help with withdrawal and suggest other alternatives.

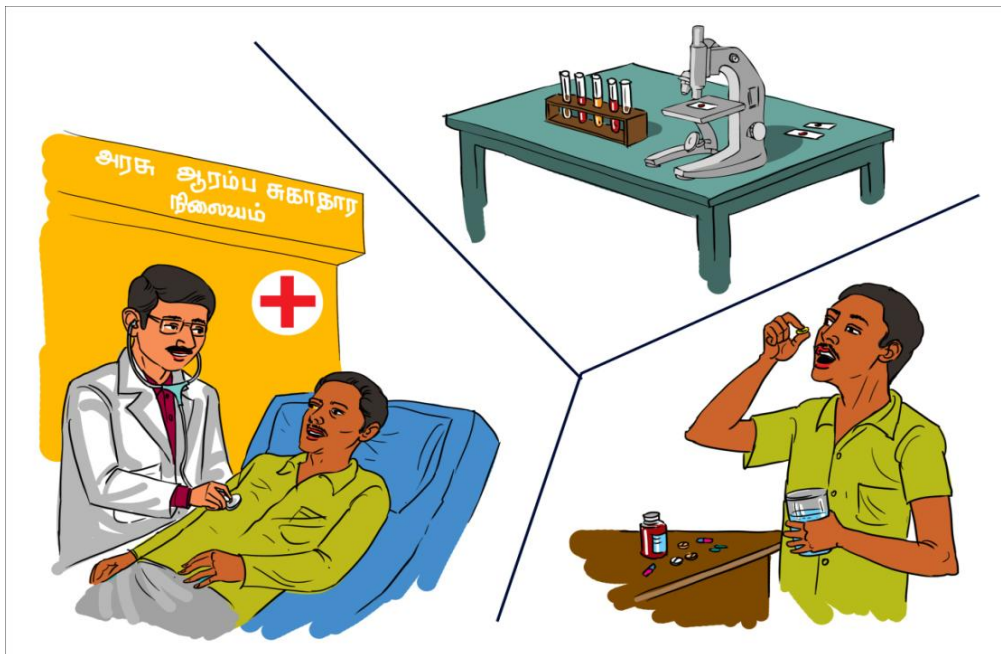
- **Stop alcohol consumption**



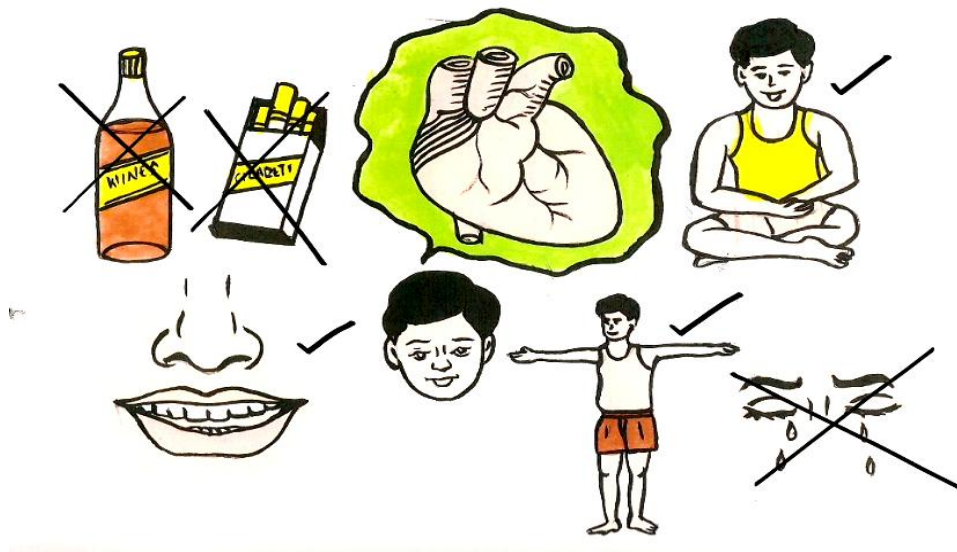
Long term drinking
damages the heart
muscles and reduces
blood supply



2.4 Management of co- morbid illness disorders



- *Control your blood sugar levels:*
 - I. Controlling diabetes is essential for reducing your risk of CAD, because diabetes is a major independent risk factor for cardiovascular disease and raises the level of LDL and triglycerides, lowers HDL, and elevates blood pressure.
 - II. Keep the condition under control with diet, exercise, faithful monitoring of blood glucose and other measures recommended by the doctor monitoring you
- *Controlling blood pressure levels:*
 - I. Adults should have their blood pressure checked at least once every 2 years
 - II. If you have high blood pressure practice laughter therapy, restrict salt diet, walk daily, avoid stress, eat healthy diet and avoid high fat foods





- *Medication adherence:*

- I. If lifestyle changes and complementary treatments are not enough to prevent coronary artery disease, medication may be necessary. Drugs are used to treat high blood pressure, elevated cholesterol levels and certain contributing diseases such as diabetes



2.5 Maintain the optimum health

Regular follow up checkups:

- The regular checkups to prevent the immediate complications promptly.
- Maintain a diary to note the fluctuation of B.P, blood sugar and cholesterol values.

- Carry a medic alert card specifying your condition, medications and close family members contact number for use in any emergency situatio

Know your numbers;

Cholesteriol

LDL Cholesterol Level	LDL-Cholesterol Category
Less than 100 mg/dL	Optimal
160-189 mg/dL	High
Total Cholesterol Level	Category
Less than 200 mg/dL	Optimal
240 mg/dL and above	High

Blood pressure

Category	Systolic (top number)	And	Diastolic (bottom number)
Normal	Less than 120	And	Less than 80
High blood pressure	140–159		90–99

References

Kottke J.Frederick., Lehmann F. Justus. (2007). Krusen’s Handbook of Physical Medicine and Rehabilitation. W.B Saunders publications. Philadelphia

Lemone Priscilla., Burke Karen. (2008). Medical Surgical Nursing Critical Thinking in Client Care. Dorling Kindersley publishers. New Delhi

Reports

- Centre for Disease Control and Prevention, (2015).
- American Diabetes Association (2015)
- World Health Organization (2012)

START LIVING HEALTHY, AND GUARD YOUR HEART



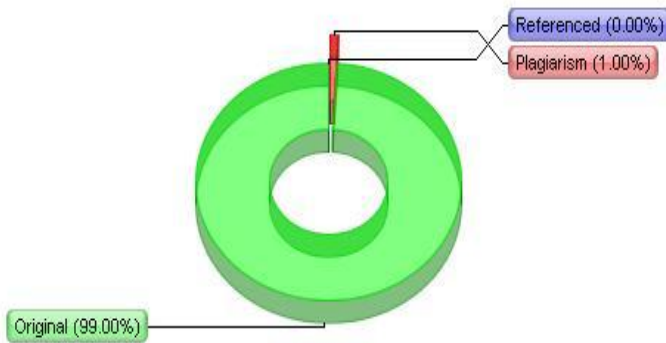
APPENDIX - L

Plagiarism Detector - Originality Report:

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Detailed document analysis:

పాఠ్య ప్రణాళిక



గుండెలో అడ్డంకి రాకుండా నివారించడానికి తీసుకోవలసిన చర్యలు

ఆపియేషన్

ఆపియేషన్

పాఠ్య ప్రణాళిక

విషయం	-	గుండెలో అడ్డంకి రాకుండా వుండడానికి నివారణ చర్యలు
వ్యవధి	-	35 - 40 నిమిషాలు
బోధనా పద్ధతి	-	బోధించడం
సమాహం	-	గుండె వ్యాధితో బాధపడే వారు
స్థలము	-	ఓ.పి. భాగం
బోధకుడు	-	రీసర్చ్
సూచన విధానం	-	పి.పి.టి. మరియు బుక్ లెట్
సీటింగ్ ఏర్పాటు	-	గుండ్రపు పద్ధతి

సాధారణ లక్ష్యాలు

గుండెలో అడ్డంకి రాకుండా వుండడానికి తీసుకోవలసిన చర్యలు గురించి ఆరోగ్య విద్య ద్వారా రోగులు చివరిలో పరిపూర్ణజ్ఞానాన్ని మరియు నైపుణ్యాన్ని పొందుతారు.


నిర్దిష్ట లక్ష్యాలు







ఆరోగ్య విద్య చివరిలో రోగులు

- గుండెలో అడ్డంకి గురించి తెలియజేయడం
- సంఘటనలు పెర్కొనండి
- ప్రమాద కారకాలు పెర్కొనండి
- గుండెలో అడ్డంకి ఏర్పడే విధానం వివరించడం.
- హెచ్చరిక సంకేతాలు పెర్కొనండి.
- సమస్యలు పేర్కొనండి
- గుండెలో అడ్డంకి రాకుండా వుండడానికి నివారణ చర్యలు వివరించడం.

వరుస సంఖ్య	వ్యవధి	నిర్దిష్ట లక్ష్యాలు	తెలుగులో వివరణ	ఎ.వి. ఎయిడ్స్	బోధన పద్ధతి	ఎవాల్యూయేషన్
1	1 నిమిషము	గుండె అడ్డంకి నిర్వచనం తెలపండి.	<p>పరిచయము గుండె రక్త నాళాలలో అడ్డంకి అనేది గుండెకు సంబంధించిన వ్యాధి, ఇది ముఖ్యంగా గుండెను వ్యాధికి గురిచేస్తుంది. అది ముఖ్యముగా గుండె రక్త నాళాలలో కొవ్వు పెరుకుపోవడం వలన అడ్డంకి ఏర్పడుతుంది.</p> <p>గుండె అడ్డంకి నిర్వచనం గుండె రక్త నాళాలలో అడ్డంకిని సి.ఎ.డి. అంటారు. ఇది ముఖ్యంగా గుండెకు రక్తం సరఫరా చేసే రక్త నాళాల్లో క్రొవ్వు చేరుకొని రక్త శాతాన్ని తగ్గిస్తుంది మరియు ఆక్సిజన్ శాతాన్ని తగ్గిస్తుంది.</p>	పి.పి.టి	వివరించడం	మీలో ఎవరైనా గుండెలో అడ్డంకి అంటే ఎమిటో చెప్పండి
2	2 నిమిషాలు	సంఘటనలు పేర్కొనబడనవి.	<p>సంఘటనలు ప్రపంచవ్యాప్తంగా - ఈ గుండె రక్త నాళాలలో అడ్డంకి వలన 17.3 మిలియన్లు ప్రజలలో మరణానికి గురిఅవుతున్నారు. ప్రతి సంవత్సరములో సుమారుగా 3.8 మిలియన్లు మగవారు, 3.4 మిలియన్లు ఆడవారు మరణానికి గురి అవుతున్నారు.</p> <p>భారత దేశంలో డబ్ల్యు.హెచ్.ఓ. లెక్క ప్రకారం 1.05 శాతం ప్రజలు గుండె రక్తనాళాల్లో అడ్డంకి వలన బాధ పడుతున్నారు.</p> <p>వయస్సు సి.ఎ.డి. అనేది 35 - 65 మధ్య వయస్సు వారిలో గల వారిలో ఎక్కువగా కనిపిస్తుంది.</p> <p>లింగం సి.ఎ.డి. (గుండె ఈ నాళాల్లో అడ్డంకి) ఏక్కువుగా మగవారిలోనే వుంటుంది ఆడవారి కంటే ఏండు కంటే మగవాళ్ళకు దూమపానం మరియు</p>	పి.పి.టి	వివరించడం	మీలో ఎవరైనా దీని సంఘటనలు చెప్పండి

3.	1 నిమిషము	కారణాలు పెర్సానల్ బడివవి.	<p>మద్యం సేవించడం వలన సి.ఎ.డి. అనేది ఆడవాళ్ళ కంటే మగవాళ్ళలోనే ఎక్కువగా వుంది).</p> <p>కారణాలు</p> <table border="1" data-bbox="342 674 854 1560"> <thead> <tr> <th>మార్పుకోలేనటువంటి కారణాలు</th> <th>మార్పుకోగలిగే కారణాలు</th> </tr> </thead> <tbody> <tr> <td>1. వయస్సు</td> <td>1. యల్.డి.యల్ (ట్రెన్లైర్స్) శాతం పెగరడం ఏర్పడడంవలన</td> </tr> <tr> <td>2. లింగం</td> <td>2. తక్కువ హెచ్.యల్.డి.యల్. విలువలు</td> </tr> <tr> <td>3. వంశపార్యంవరంగా</td> <td>3. రక్త పోటు</td> </tr> <tr> <td>4. క్రోమోసోమాల మార్పిడి వలన</td> <td>4. పొగ త్రాగడం</td> </tr> <tr> <td></td> <td>5. మద్యం సేవించడం</td> </tr> <tr> <td></td> <td>6. శారీరక పనులను తగ్గించడం</td> </tr> <tr> <td></td> <td>7. స్థూల కాయత్వం</td> </tr> <tr> <td></td> <td>8. బి.,యమ్.ఐ. ఎక్కువ ఇవ్వడం</td> </tr> <tr> <td></td> <td>9. రక్తంలో చక్కెర శాతం పెరగడం</td> </tr> </tbody> </table>	మార్పుకోలేనటువంటి కారణాలు	మార్పుకోగలిగే కారణాలు	1. వయస్సు	1. యల్.డి.యల్ (ట్రెన్లైర్స్) శాతం పెగరడం ఏర్పడడంవలన	2. లింగం	2. తక్కువ హెచ్.యల్.డి.యల్. విలువలు	3. వంశపార్యంవరంగా	3. రక్త పోటు	4. క్రోమోసోమాల మార్పిడి వలన	4. పొగ త్రాగడం		5. మద్యం సేవించడం		6. శారీరక పనులను తగ్గించడం		7. స్థూల కాయత్వం		8. బి.,యమ్.ఐ. ఎక్కువ ఇవ్వడం		9. రక్తంలో చక్కెర శాతం పెరగడం	పి.పి.టి	పి.పి.టి	మీలో ఎవరైనా కారణాలు చెప్పండి
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5.	2 నిమిషాలు	హెచ్చరిక సంకేతాలు ఘోషించినవి	<p style="text-align: center;">హెచ్చరిక సంకేతాలు</p> <ul style="list-style-type: none"> ● ఎడమ చేతి వైపు, వీపు వెనుక భాగం నొప్పి. ● మెడ, దవడ నొప్పి. ● శ్వాస తీసుకోవడం ఇబ్బంది కలగడం ● తల నొప్పి వుండడం ● కడుపు నొప్పి రావడం 	పి.వి.టి	వివరించడం	మీలో ఎవరైనా హెచ్చరిక సంకేతాలు చెప్పండి
			<p style="text-align: center;">అధిక క్రొవ్వు పదార్థాలను తీసుకోవడం వలన</p> <p style="text-align: center;">→</p> <p style="text-align: center;">ఆ క్రొవ్వు రక్తనాళాలలో చేరుకొని</p> <p style="text-align: center;">→</p> <p style="text-align: center;">గుండెకు రక్త ప్రవాహాన్ని తగ్గిస్తుంది</p> <p style="text-align: center;">→</p> <p style="text-align: center;">రక్తం తగ్గడం వలన గుండె నొప్పి వస్తుంది</p>			

			<div data-bbox="164 1283 228 1499" style="border: 1px solid black; padding: 2px;"> <p>కాళ్ళ బాటలు</p> </div> 	<div data-bbox="164 1010 269 1226" style="border: 1px solid black; padding: 2px;"> <p>లబ్బాయిలలా</p> </div> 	<div data-bbox="164 751 248 932" style="border: 1px solid black; padding: 2px;"> <p>ముఠులబ్బ</p> </div> 		
6.	1 నిమిషము	గుండె అడ్డంకి సమస్యలు చెప్పబడినది.	<div data-bbox="781 1283 940 1541" style="border: 1px solid black; padding: 2px;"> <p>శ్వసన కాయల 'బట్టలు</p> </div> 	<div data-bbox="781 1010 902 1247" style="border: 1px solid black; padding: 2px;"> <p>కాలనబ్బ</p> </div> 	<div data-bbox="781 751 902 953" style="border: 1px solid black; padding: 2px;"> <p>కలుగుల శక్తిలు</p> </div> 	పి.పి.టి	పి.పి.టి
7.	20 నిమిషము	గుండెలో అడ్డంకి రాకుండా	<p>సమస్యలు</p> <ul style="list-style-type: none"> ● కాళ్ళలో వుండే రక్త నాళాల్లో రక్తం గడ్డ కట్టడం ● మెదడు పోటు రావడం ● ఛాతి నొప్పి రావడం ● ఆకస్మాత్తు మరణం. <p>గుండెలో అడ్డంకి రాకుండా నివారించడానికి తీసుకోవలసిన చర్యలు । ఎ. ఆహార నియమాలు0</p>			పి.పి.టి	పి.పి.టి

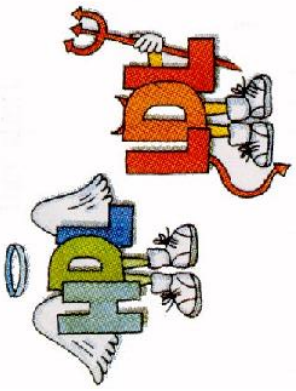
మీలో ఎవరైనా
దీని సమస్యలు
చెప్పండి.

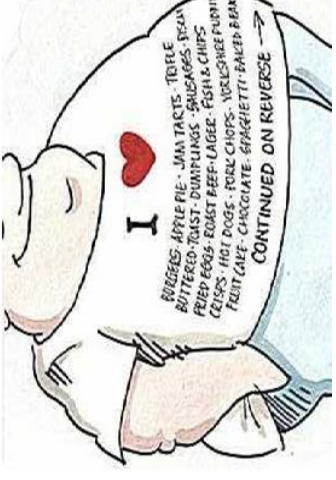
మీలో ఎవరైనా
రెండు లేదా
చూడు చర్యలు

	<p>నివారించడానికి తీసుకోవలసిన చర్యలు వివరించబడినది.</p>	<ul style="list-style-type: none"> - రోజు కూరగాయలు, మరియు ఆకు కూరలు తినడం. - రోజు సోయా మరియు లైస్యమ సంబంధించిన పదార్థాలను తినాలి. - రోజు తెల్ల గడ్డలను తీసుకోవడం వలన రక్తంలో కొలెస్ట్రాల్ శాతం తగ్గుతుంది. - రోజు పీచు పదార్థాలన్ని తీసుకోవాలి. - ఉప్పును రోజుకు అర టీస్పూన్ తీసుకోవాలి. - గుడ్డు పసుపు భాగాన్ని మాంసం, బట్టర్ చికెన్, బట్టర్ చేప స్ట్రె, పాలు వీటిలో ఏటిని ఉపయోగించడం తగ్గించాలి / లేదా అపివేయాలి బిస్కెట్లో, కేకులు తీసుకోకూడదు. 		<p>చెప్పండి.</p>
		<p>బి. వంట నూనెలు</p> <ul style="list-style-type: none"> - వేరుశనగ నూనె, ఆలివ్ నూనెలు వాటిలో మోనో సాచురెట్ క్రొవ్యు వుంటుంది ఇది కొలెస్ట్రాల్ను చేరనివ్వదు. - ఓమెగా-3- క్రొవ్యు ఆమ్లాలు -ట్రైగ్లిసరైడ్స్ తగ్గిస్తుంది, ఇది సొల్యాస్ చేపలలో ఎక్కువగా వుంటుంది. 		



			<p>సి. ఆరోగ్య కరమైన శారీరక బరువు !</p> <ul style="list-style-type: none"> - హెచ్.డి.యల్ శరీరానికి మంచి క్రొవ్డును అందిస్తుంది. కాని యల్.డి.యల్ క్రొవ్డు శరీరానికి హానిని కలుగ జేస్తుంది. - ఈ హెచ్.డి.యల్ కొలెస్ట్రాల్ వలన మధుమేహం వచ్చే అవకాశం వుంది. - కొవ్వు ఉదర భాగంలో చేరుకోవడం వలన హృదయానికి సంబంధించిన వ్యాధులు వచ్చే అవకాశం వుంది. - నడుము చుట్టుకొలత ఆడ వారిలో 35 ఇన్చెలు కంటే తక్కువ వుండాలి. మగ వారిలో 40 ఇన్చెలు కంటే తక్కువ వుండాలి. 		
			<p>1. నిత్యకృతమైన వ్యాయామాలు</p> <p>వ్యాయామాలు మొదలు పెట్టే ముందు వార్మ అప్ చేయాలి.</p> <ul style="list-style-type: none"> - వారంలో 5 రోజులు 30 నిమిషాలు పాటు శారీరక వ్యాయామాలు చేయాలి. <p>అవి - ప్రతి రోజు నడవాలి.</p> <ul style="list-style-type: none"> - 20 నిమిషాలు పాటు అయితే ఏరోబిక్ వ్యాయామాలు చేయాలి. <p>అవి పరిగెత్తడం, ఇవి వారానికి 2 రోజులు చేస్తే చాలు.</p> <ul style="list-style-type: none"> - చాలా తేలికైన వ్యాయామాలు రోజు పాటింటే కార్మికమాలలో చేయాలి. ఉదా,, లిఫ్టులు ఉపయోగించ కుండా మెట్లను ఉపయోగించడం. 		





2. వ్యాయామాలలో 3 భాగాలు వున్నాయి

1. వార్మఅప్ భాగం
2. కండిషన్ భాగం (పరిస్థితి వ్యాయామాలు)
3. కూల్ డౌన్ భాగం (చల్లని వ్యాయామాలు)


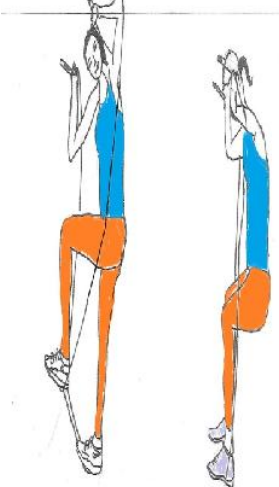
సన్నాహక వ్యాయామాలు

ఇది దాదాపు 5 నిం.॥ పాటు చేయాలి. దీని వలన శరీరానికి రక్త సరఫరా జరుగుతుంది. అవి వెలాంటీ ఆట.

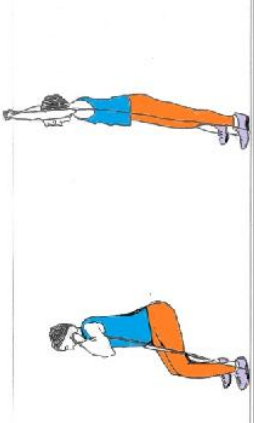
మెడ కదలికలు - పైకి, క్రిందకు, త్రిపుడం

చేయి కదలికలు - లోపలి, వేలుపలికి వంచడం, అరచేతిని తిప్పడం.

కాళ్ళ కదలికలు - లోపలికి, వెలుపలికి వంచడం అరికాళ్ళను తిప్పడం.

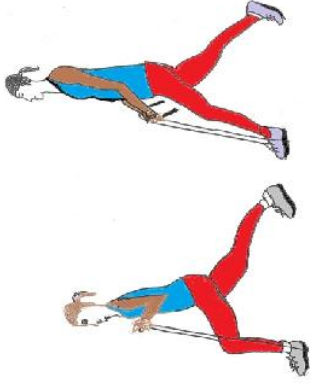
						
		<p>కండిషన్ భాగం ట్రిప్లీ క్రాచ్ కాళ్ళు క్రింద భాగంలో దారున్ని వుంచి వెనకకు పడుకోవాలి. భుజాలను క్రిందకు వంచాలి. కుడి మోచేతిని మరియు ఎడమ మోకాలును ఒకేసారి త్రిప్పాలి. తిరిగి మామూలు స్థితికి వెళ్ళి వేరొక వైపు ఇదే విధంగా చేయాలి.</p>				
		<p>స్వాక్టా బవెర్ హెడ్ ప్రస్ మోకాళ్ళును నడుమును వంచి దారాన్ని కాళ్ళ క్రింద వుంచి దాన్ని హ్యాండిల్స్ను చేతిలో పట్టుకొని దాన్ని భుజాలకు సమానం తీసుకొని రావాలి. మోకాళ్ళును వంచి కూర్చోనే స్థితిలో వుండేటప్పుడు, దీని తరువాత నిలబడి చేతులను తలపై భాగానికి</p>				

ఏత్తాలి. మోచేతులు వంచాలి.



స్టాటిక్ ల్యాండ్ మరియు ఖైసెవ్ కల్స్

ముందుగా ఎడమ మోకాలు వంచి, కుడి మోకాలు వెనకకు చాచి కూర్చోవాలి. దాని తరువాత దురాన్ని కాలి క్రింద వుంచి కుడి కాలను హీల్ భాగాన్ని ఎత్తాలి. హ్యాండిల్స్ను పట్టుకొని పైకి లాగి పట్టుకోవాలి. అలాగే పైకి పట్టుకొని అర చేతులు పై వైపు వుండాలి. మోకాళ్ళను 90 డి వంచాలి చేతులని పైకి ఎత్తేటప్పుడు అలాగే మోచేతులను వంచాలి.



డి. పొగ త్రాగడం నిలిపినేయాలి

స్టాట్ అనే ప్రకార మనం ప్రొగ త్రాగడం అపివేయాలి.

యస్ - అంటే దూమపానం అపివేయడం ఒక తేది పెట్టుకోవాలి.

రెండు వారాలలో వుండే తడి మనం తీసుకోని, మానివేయడానికి గట్టిగా ప్రయత్నించాలి.


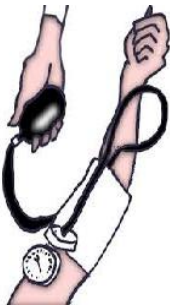


- టి - మన కుంటుంబ సభ్యులకు బంధువులకు మరియు స్నేహితులకు మీరు దూమ పానం మానివేస్తున్నట్లు చెప్పాలి.
- ఎ - ఈ ధూమ పానం మానివేసేటప్పుడు ఎదుర్కొనే సమస్యలు ముందుగానే ఆలోచించి వాటికి ప్రత్యామ్నాయాలను సిద్ధం చేయాలి.
- ఆర్ - మణరటిలో, కార్లలో మరియు మీరు పని చేసే ప్రాంతాలలో ప్రాగకు సంబంధిన వస్తువులు వుండకూడదు.
- టి - మీరు మానేయాలి అనే ప్రయాత్నాన్ని మీరు డాక్టరు చెప్పి, వారి నుండి మీ సహయాన్ని తీసుకోవాలి.

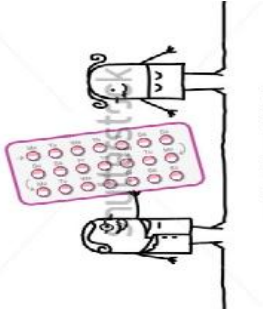
ఇ.మద్యం సేవించడం అపివేయాలి !

మద్యం సేవించడం వలన ఇది గుండె రక్త నాళాల్లో అడ్డంకోని ఏర్పరుస్తుంది.



		<p>యఫ్. గుండెలో అడ్డంకిని కలగ చేసే వ్యాధులను అదుపులో వుంచుకోవడం</p> <ul style="list-style-type: none"> - మధుమేహాన్ని అదుపులో వుంచుకోవడం: మధుమేహాన్ని ముందుగా అదుపులో ఉంచుకోవాలి. ఎందుకంటే ఇది క్రొవ్వు గుండె రక్తనాళి చేరుకొనేలాగా చేస్తుంది. దాని వలన దీన్ని అదుపులో వుంచుకోవాలి. - ఎలాగంటే రోజు వ్యాయామాలు, ఆహార నియమాలు పాటించడం. క్రమంగా చక్కర శాతాన్ని పరీక్షించుకోవడం ఇంకాను మందులను వాడడం. 		
		<p>అధిక రక్త పోటును అదుపులో వుంచుకోవడం ।</p> <ul style="list-style-type: none"> - 20 సం.లు నిండిన ఆడ, మగ అందరూ 2 సం.లు ఒక్క సారి రక్త పోటును పరీక్షించుకోవాలి. - దీన్ని అందుపులో వుంచాలంటే రోజు నవ్వుడం, ఉప్పును తగ్గించినాళి. రోజు నడవాలి, వత్తిడిని తగ్గించాలి. ఆరోగ్యకరమైన ఆహారాన్ని తీసుకొని, క్రొవ్వును తగ్గించాలి. 		
				
		<p>మందులను చికిత్స విధానం ।</p> <p>రోజు వారి పనుల నడవడికలతో మార్పులు మరియు ఆయుర్వేద చికిత్స</p>		

			<p>లాంటివి గుండెలో అడ్డంకి రావడాన్ని నిరోధించలేవు. గుండెలో అడ్డంకిని లాకుండా నివారించడాన్నీ, మందులు కూడా అవసరం. కావున మందులు వాడడం అవసరం, అందువలన, మదు మేహానికి, అధిక రక్త పోటుకు, అధిక కొల్స్ట్రాల్కు మందులు తప్పని సరిగా వాడాలి.</p>			
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