

A Methodological Study to Develop a Self Risk Assessment Tool (SRAT) to Identify the Coronary Artery Disease Risk Status of Adults (30-60 Years) In Selected Urban Areas of Gwalior

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Abstract: A methodological study to develop a Self Risk Assessment tool (SRAT) to identify the Coronary Artery Disease risk status of adults (30-60 years) in selected urban areas of Gwalior (M. P.) was conducted with the objectives to prepare a self risk assessment tool on coronary artery disease risk status to establish the validity (content, construct, criterion and predictive) of the self assessment tool on Coronary artery disease to find out the reliability of the self risk assessment tool on Coronary artery disease to determine the acceptability of the self risk assessment tool on Coronary artery disease to assess the level of risk on coronary artery disease to find out association between socio demographic variables with components in self risk assessment tool on coronary artery disease. The conceptual framework was based on Individual perception, perceived susceptibility, modifying factors, demographic variables, perceived threat, cues to action, likelihood of action, perceived benefits, perceived barrier, taking recommended perceived action health belief model developed by Resntoch's & Becker's (1974). A Methodological research design and evaluative research approach was adopted for the study. Sample size was 100 subjects selected by convenient Sampling technique. Data was collected by developing self risk assessment tools to assess the risk status of coronary artery disease among adults (30-60 years). Major findings of the study were the most common found depicts that 14% of the adults had low risk, 17% had mild risk, 29% had moderate risk and 40% had high risk. Minimum risk score in pretest was 35 and maximum risk score was 125. Mean risk score was 86.51 ± 27.83 and mean percentage risk score was 61.79 ± 19.87 .

Keywords: Methodology, Self risk assessment tool (SART), Coronary Artery Disease (CAD), Risk Status, adults

1. Introduction

“Encased in fat in youth, encased in a coffin in middle age.”

Ancient Chinese proverb

Cardio Vascular Disease is responsible for about thirty percent of all death worldwide each year. In India at the onset of 21st century, Cardio Vascular Disease accounts for nearly fifty percent of all deaths. It was noticed that there was a steady increase of heart disease from 1950 and 1977. So the World Health Organization concluded that heart disease is the world's most serious epidemic.¹

Coronary Artery Disease (CAD) has been often considered as “affluent person's disease” that is a disease caused by easy and sedentary life style, high calorie and high fat diet. There are two main branches, the right and left coronary arteries which branch from the aortic valve. The coronary arteries receive about 5% of the blood pumped from the heart, although the heart comprises a small proportion of body weight. The large blood supply, especially to the left ventricle, highlights the importance of heart to the body function. The coronary arteries traverse to the heart, eventually forming a vast network of capillaries. The coronary arteries that run on the surface of the heart are called epicardial coronary arteries. These arteries, when healthy, are capable of auto regulation to maintain coronary blood flow at levels appropriate to the needs of the heart

muscle. These relatively narrow vessels are commonly affected by atherosclerosis and can become blocked, causing angina or a heart attack. The coronary arteries that run deep within the myocardium are referred to as subendocardial.²

Coronary Artery Disease is characterized by atherosclerosis in the epicardial coronary arteries. Atherosclerotic plaques, the hallmark of atherosclerosis, progressively narrow the coronary artery lumen and impair ante-grade myocardial blood flow. The reduction in coronary artery flow may be symptomatic or asymptomatic, occur with exertion or at rest, and culminate in a myocardial infarction, depending on obstruction severity and the rapidity of development³.

A recent study (2015) conducted by Ujjwala Ramchandra in Kerala, which analyzed all major world ethnic groups in relation to heart disease found that Indians have the highest risk of Coronary Heart Disease, with rates three to four times higher than Americans, six times more than Chinese and twenty times more than the Japanese. In North India, 7-10% of people have Coronary Artery Disease while the prevalence is as high as 14% in South India. The WHO expert committee on prevention of Coronary Artery Disease identified a number of lifestyles and environmental factors as the underlying causes of Coronary Heart Disease. These risk factors may be conceptualised as modifiable and non modifiable. Age, sex, smoking history of high blood pressure, diabetes, elevated plasma cholesterol /triglycerides, obesity, sedentary lifestyle, personality type and

psychological stress are considered some of the major risk factors for Coronary Artery Disease. Of the many known risk factors, age, sex and genetic pre – disposition cannot be altered. Other risk factors can be altered and therefore, it is essential to characterize specific risk factors that influence the rapid progress of this disease in various ethnic populations⁴.

In 2020 AD, 2.6 million Indians are predicted to die due to Coronary Heart Disease (CHD) which constitutes 54.1% of all Cardio Vascular Disease (CVD) deaths. Nearly half of these deaths are likely to occur in young and middle aged individuals (30-69 years). An increasing number of Indians, even among the younger age groups are prone to get heart diseases due to their health damaging lifestyle.⁵

The prevention of coronary artery disease involves prevention at three levels: Primary prevention involves developing an awareness of potential areas of risk among the individuals and the specific measures taken prior to the clinical evidence of the disease or injury. It also involves identification of individuals who are at risk. Secondary prevention directed towards disrupting the already established disease process by means of early diagnosis and prompt treatment with the goal of reversing or slowing process of disease. Tertiary prevention includes rehabilitation of a patient who has suffered from the disease with the goal of restoring him to the optimal level of physical, psychological, social and vocational status. Nurses worldwide are engaged in innovative activities on a daily basis; activities motivated by the desire to improve patient care outcome and the need to decrease costs of health system. In Coronary Artery Disease, the nurses have a significant role in making a difference in people's attitude regarding health care and life style modifications.⁶

2. Objectives of the Study

- 1) To prepare a self risk assessment tool on Coronary Artery disease.
- 2) To establish the validity (content, construct, criterion and predictive) of the self assessment tool on Coronary artery disease.
- 3) To find out the reliability of the self risk assessment tool on Coronary artery disease.
- 4) To determine the acceptability of the self risk assessment tool on Coronary artery disease.
- 5) To assess the level of risk on coronary artery disease.
- 6) To find out association between socio demographic variables with components in self risk assessment tool on coronary artery disease.

Hypothesis:

H1: There is significant difference between level of stress among adults with their demographic variables.

3. Material Method

“A Methodological study to develop a Self Risk Assessment tool (SRAT) to identify the Coronary Artery Disease risk status of adults (30-60 years) in selected urban areas of Gwalior.”

The conceptual framework selected for this study was based on Individual perception, perceived susceptibility, modifying factors, demographic variables, perceived threat, cues to action, likelihood of action, perceived benefits, perceived barrier, taking recommended perceived action health belief model developed by Resntoch's & Becker's (1974). The research approach used in this study is Evaluatory research approach. The tool was tried on 10 people in Gwalior. The reliability of tools i. e. risk assessment tool was computed by parallel form method using Pearson's coefficient of correlation to identify the Coronary Artery Disease risk status of adults (30-60 years) in Gwalior city. The reliability of risk assessment questionnaire was $r = 90.82\%$ and pearson's correlation coefficient value is 0.832. The tool was reliable.

Prior to data collection formal written permission was obtained from the concerned ethical authorities Chief Medical Officer (CMO) of District hospital, Gwalior for conduction of the study. Written informed consent from adults of urban areas of mahaveer colony Gwalior was obtained for willingness to participate themselves in the study. Study was conducted in the month of August 2018. The data analysis was done by using descriptive and inferential statistics i.e. by calculating frequency, percentage, mean score, mean percentage, standard deviation, chi square, to identify the Coronary Artery Disease risk status of adults (30-60 years). The level of significance chosen was $p < 0.05$ Tables, figures and graphs were used to depict the findings.

4. Results

Section A: Description of demographic variables of the sample

Table 1: Distribution of adults (30-60 years) according to their demographic characteristics, n=100

Demographic Variables	No. of adults (f)	Percentage (%)
Age (yrs)		
30-45 years	52	52
46-60 years	48	48
Gender		
Male	52	52
Female	48	48
Educational Status		
High School	43	43
HSE	2	2
Graduate	33	33
Post Graduate	22	22
Occupation		
Sedentary Worker	42	42
Moderate Worker	41	41
Heavy Worker	17	17
Religion		
Hindu	76	76
Muslim	24	24
Christian	0	0
Others	0	0
Marital Status		
Single	0	0
Married	100	100
Widower	0	0
Dietary Habits		

Vegetarian	55	55
Non Vegetarian	45	45
Family history of heart disease		
Yes	41	41
No	59	59
BMI Measures		
Normal (18.5-24.9)	46	46
Overweight (25-29.99)	15	15
Obese (30-39.9)	39	39
Overweight (≥ 40)	0	0

The Table 1 shows that majority were aged between 52 (30-45 years), 52 and 48 male and females were respectively. Regarding the educational status, majority were high school graduate 43 (43%), 42 (42%) were sedentary worker, 76 (76%) were Hindu, 100 (100%) were married, 55 (55%) were vegetarian, 41 (41%) were having family history of heart disease, 46 (46%) were having normal BMI measures & 39 (39%) were having obese. This tables shows that men were having more chance prone to get coronary artery disease as compared to females.

Section B

Establishment of the Validity (Content, Construct, Criteria And Predictive) of Self Risk Assessment Tool on Coronary Artery Disease

Validity of Content: In order to obtain content validity of the data collection tool, the prepared instrument along with the problem statement, objectives, operational definitions, blue print, and criteria checklist and answer key designed for validations were submitted to 11 experts who were in the field of Medical surgical nursing, Cardiologist, Physician, English and Hindi Professors.

Construct Validity: In this study risk assessment questionnaires were prepared to assess the risk status of adults regarding coronary artery disease. Risk assessment questionnaires consisting of 35 risk factors items and 9 demographical variables were developed. Risk factor items sought information to assess the risk status of adults regarding coronary artery disease marking as low risk, mild risk, moderate risk, high risk.

Criteria for Evaluation: Criteria checklist made for evaluation of the tool. This includes Selection of content, Organization of the content, presentation, language.

Predictive: self risk assessment tools are forecasting judgement of high risk (40%), moderate risk (29%), mild risk (17%), low risk (14%) percentage score prone to get coronary artery disease among adults (30-60 years).

Section C

Reliability of Self Risk Assessment Tool on Coronary Artery Disease:

Reliability Analysis: Parallel Form method of reliability

Pearson's Correlation Coefficient	0.832
Reliability (%)	90.82%

The result of correlation coefficient ranges between -1.00 through 0.0 and +1.00. The results shows that a score above 0.70 indicates an acceptable level of reliability of a tool. So that By using Parallel form method of reliability, it is found to be 90.82% and Pearson's Correlation Coefficient value is 0.832. Hence this value is reliable and acceptable for tools.

Section D

Assessment of Risk Level for Developing Coronary Artery Disease among Adults (30-60 Years):

Table 3: Assessment of risk level for developing coronary artery disease, n=100

Level of Risk	Score Range	Level of Risk	
		No of adults	Percentage
Low Risk (1-35)	0-25%	14	14
Mild Risk (36-70)	26-50%	17	17
Moderate Risk (71-105)	51-75%	29	29
High Risk (106-140)	76-100%	40	40
Minimum score		35	
Maximum score		125	
Mean knowledge score		86.51 $\pm$ 27.83	
Mean % Knowledge Score		61.79 $\pm$ 19.87	

The table shows that all 14% of the adults had low risk, 17% had mild risk, 29% had moderate risk and 40% had high risk. Minimum risk score in pretest was 35 and maximum risk score was 125. Mean risk score was 86.51 $\pm$ 27.83 and mean percentage risk score was 61.79 $\pm$ 19.87.

Distribution level of Risk score

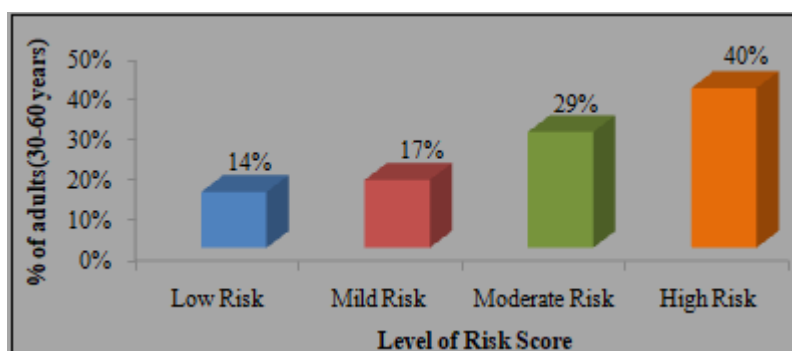


Figure 1: Assessment level of risk status among adults (30-60 years)

Section E

Association of Level of Risk Score in Relation to Demographic Variables

Table 4: Association of risk score regarding Coronary Artery Diseases in relation to age, n=100

Age (yrs)	No. of adults	Mean risk score	t-value	p-value
30-45 years	52	69.84±27.10	7.95	0.0001 S, p<0.05
46-60 years	48	104.56±13.94		

The table shows the association of risk score with age in years of adults aged 30-60 years regarding coronary artery disease. The tabulated 't' values was 1.98 (df=98) which is much less than the calculated 't' i. e. 7.95 at 5% level of significance. Also the calculated 'p'=0.0001 which was much less than the acceptable level of significance i. e. 'p'=0.05. Hence it is interpreted that age in years of adults aged 30-60 years is statistically associated with their risk score.

Table 5: Association of risk score regarding Coronary Artery Diseases in relation to gender, n=100

Gender	No. of adults	Mean risk score	t-value	p-value
Male	52	90.98±28.51	1.68	0.09 NS, p>0.05
Female	48	81.66±26.51		

This table shows the association of risk score with gender of adults aged 30-60 years regarding coronary artery disease. The tabulated 't' values was 1.98 (df=98) which is much higher than the calculated 't' i. e. 1.68 at 5% level of significance. Also the calculated 'p'=0.09 which was much higher than the acceptable level of significance i. e. 'p'=0.05. Hence it is interpreted that gender of adults aged 30-60 years is statistically not associated with their risk score.

Table 6: Association of risk score regarding Coronary Artery Disease in relation to education, n=100

Educational Status	No. of adults	Mean risk score	F-value	p-value
High School	43	105.06±12.80	46.51	0.0001 S, p<0.05
HSE	2	112±0		
Graduate	33	85.09±19.69		
Post Graduate	22	50.04±23.86		

This table shows the association of risk score with educational level of adults aged 30-60 years regarding coronary artery disease. The tabulated 'F' values was 2.70 (df=3, 96) which is much less than the calculated 'F' i. e. 46.51 at 5% level of significance. Also the calculated 'p'=0.0001 which was much less than the acceptable level of significance i. e. 'p'=0.05. Hence it is interpreted that educational level of adults aged 30-60 years is statistically associated with their risk score.

Table 7: Association of risk score regarding Coronary Artery Diseases in relation to occupation, n=100

Occupation	No. of adults	Mean risk score	F-value	p-value
Sedentary Worker	42	99.97±19.33	36.83	0.0001 S, p<0.05
Moderate Worker	41	88.70±19.33		
Heavy Worker	17	47.94±28.81		

This table shows the association of risk score with occupation of adults aged 30-60 years regarding coronary artery disease. The tabulated 'F' values was 3.09 (df=2, 97) which is much less than the calculated 'F' i. e. 36.83 at 5% level of significance. Also the calculated 'p'=0.0001 which was much less than the acceptable level of significance i. e. 'p'=0.05. Hence it is interpreted that occupation of adults aged 30-60 years is statistically associated with their risk score.

Table 8: Association of risk score regarding Coronary Artery Diseases in relation to religion, n=100

Religion	No. of adults	Mean risk score	t-value	p-value
Hindu	76	85.65±30.18	0.54	0.58 NS, p>0.05
Muslim	24	89.20±18.77		
Christian	0	0±0		
Others	0	0±0		

This table shows the association of risk score with religion of adults aged 30-60 years regarding coronary artery disease. The tabulated 't' values was 1.98 (df=98) which is much higher than the calculated 't' i. e. 0.54 at 5% level of significance. Also the calculated 'p'=0.58 which was much higher than the acceptable level of significance i. e. 'p'=0.05. Hence it is interpreted that religion of adults aged 30-60 years is statistically not associated with their risk score.

Table 9: Association of risk score regarding Coronary Artery Diseases in relation to dietary habits, n=100

Dietary habits	No. of adults	Mean risk score	t-value	p-value
Vegetarian	55	71.60±27.77	7.33	0.0001 S<p<0.05
Non Vegetarian	45	104.73±13.37		

This table shows the association of risk score with dietary habits of adults aged 30-60 years regarding coronary artery disease. The tabulated 't' values was 1.98 (df=98) which is much less than the calculated 't' i. e. 7.33 at 5% level of significance. Also the calculated 'p'=0.0001 which was much less than the acceptable level of significance i. e. 'p'=0.05. Hence it is interpreted that dietary habits of adults aged 30-60 years is statistically associated with their risk score.

Table 10: Association of risk score regarding Coronary Artery Diseases in relation to F/H/O of heart disease, n=100

F/H/O heart disease	No. of adults	Mean risk score	t-value	p-value
Yes	41	98.53±19.35	3.84	0.0001 S<p<0.05
No	59	78.15±29.84		

This table shows the association of risk score with family history of heart disease of adults aged 30-60 years regarding coronary artery disease. The tabulated 't' values was 1.98 (df=98) which is much less than the calculated 't' i. e. 3.84 at 5% level of significance. Also the calculated 'p'=0.0001 which was much less than the acceptable level of significance i. e. 'p'=0.05. Hence it is interpreted that family history of heart disease of adults aged 30-60 years is statistically associated with their risk score.

Table 11: Association of risk score regarding Coronary Artery Diseases in relation to BMI measures, n=100

BMI measures	No. of adults	Mean risk score	F – value	p-value
Normal (18.5-24.9)	46	67.71±27.36	34.24	0.0001 S<p<0.05
Overweight (25-29.99)	15	93.60±21.67		
Obese (30-39.9)	39	105.94±11.07		
Overweight (≥40)	0	0±0		

This table shows the association of risk score with BMI measures of adults aged 30-60 years regarding coronary artery disease. The tabulated 'F' values was 3.09 (df=2, 97) which is much less than the calculated 'F' i. e. 34.24 at 5% level of significance. Also the calculated 'p'=0.0001 which was much less than the acceptable level of significance i. e. 'p'=0.05. Hence it is interpreted that BMI measures of adults aged 30-60 years is statistically associated with their risk score.

5. Conclusion

The present study assess the risk status of coronary artery disease among adults by developing self risk assessment tools. The result revealed that self risk assessment tools are reliable and acceptable at 0.832 Pearson's Correlation Coefficient value. At last the results this study shows that males are more prone to get CAD as compare to female.

6. Limitations

The study was limited to sample size of 100 adults due to time constraints so findings could not be generalized and confined to small number of subjects and shorter period.

7. Acknowledgement

First of all, I thank God almighty for his grace and abundant blessings. He has showered on me throughout the course of study. His felt presence gave me the strength to successful completion this study.

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