

## Risk appraisal for cardiovascular disease among selected young adult women in Coimbatore, India

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### Abstract

Women's nutrition is another crosscutting issue that influences all aspects of health and well-being through adolescent into their early twenties. Young women undergo dramatic changes including physical, social, cognitive and emotional development. Considering the issues important to the health and lifestyle of young women, this study focused on the assessment of risk for cardiovascular diseases among young women in Coimbatore, Tamil Nadu. A total of 300 women between the age group of 20 and 40 years were identified for the conduct of the study. The selected women subjects were assessed for the risk of cardiovascular diseases using a formulated risk assessment index (RAI). The selected women were appraised by categorization of the subjects into low risk, moderate risk and high risk based on the scores. These Risk Assessment Index scores were compared with lipid profile of the subjects.

**Keywords:** Women, diet, exercise, healthcare, obesity; risk appraisal; lipid profile, India

### Introduction

Everyday we are bombarded with nutrition and health messages and a seemingly endless array of concerns about lifestyle and diet. Making smart food choices early in life and through adulthood can also help reduce the risk of certain conditions such as obesity, heart diseases, hypertension, diabetes and osteoporosis (WHO, 1995). The number of productive life lost due to cardiovascular diseases will increase in 2030 for India by 95%. Globally, cardiovascular diseases are the number one cause of death and are projected to remain so. About 80% of the deaths occurred in low and middle income countries (AHA, 2008).

The modern Indian woman is subjected to excessive stress at home and work. Overworking, under-resting and a higher level of frustration at work bring about greater aggression in quality of life. The primary factor that causes cardiac problem is stress (Parikh, 2009). The effects of unhealthy diet and physical inactivity may show up individuals with raised blood pressure, blood glucose, blood lipids, overweight and obesity, which are called "Intermediate risk factors". Hence this study is an attempt to focus on the risk assessment for cardiovascular disease among selected young adult women in Coimbatore focusing working and non-working women with the following objectives: 1) Identify young adult women aged 20 to 40 years in working and non-working groups, 2) Assess risk for cardiovascular diseases among the selected young adult women and 3) Apply intervention strategies in management of cardiovascular diseases.

### Methodology

The methodology adopted for the study comprises the following steps:

#### *Selection of area and identification of women subjects*

The area selected for the conduct of the study was Coimbatore in India based on the accessibility and the cooperation rendered in identification of the women subjects. The subjects selected were young adult women between the age group of 20 and 40 years covering both working and non-working sector using purposive sampling method. A total of 300 women from working and non-working sector were included for the conduct of the study. One hundred and fifty women employees from schools, colleges, insurance companies, textiles mills and information technology sectors formed the group for working women. One hundred and fifty home makers from selected residential areas of Coimbatore formed the group for non-working women.

#### *Formulation of a risk assessment index (RAI) for cardiovascular diseases*

According to Duffy *et al.* (2002) Nutrition components of health risk appraisal (HRA) aims to rapidly and accurately assess dietary behaviour that increase the disease risk. A risk assessment index was developed to predict the extent of risk for cardiovascular diseases among selected young adult female population. The risk assessment index comprised the risk factors namely age, family history, physical activity, obesity, diabetes and dietary pattern. Based on the scores the young female adults were categorized as low, medium or high risk for cardiovascular diseases.

#### *Appraisal of health risk among selected young adult women*

The subjects with scores 0-50 were categorized into low risk, 51-100 as moderate risk and >100 as high risk. The sub sample of thirty six women subjects with six women from each category (low, moderate, high risk)

were selected from working and non-working sector and were examined for lipid profile.

#### *Nutrition and lifestyle education for the selected young adult women*

Based on the food consumption and lifestyle pattern to predict and prevent the cardiovascular diseases for the selected women subjects, Nutrition and lifestyle education were planned. Counselling was given to the women subjects in form of individual and group counselling for the working and non-working women respectively using developed visual and non-visual aids.

### Results and discussion

The age-wise distribution of the selected women subjects is given in Table 1. Among the three hundred women subjects selected for the study, 68% of working women and 75% of non-working women belonged to the age group 20 to 30 years. 32% of working women and 25% non-working women belong to the age group of 31 to 40 years. The study is lined with the research by Rochester (2007) who found out heart disease is the third leading cause of death for women 25 and 44 years.

The details of the familial tendency to cardiovascular diseases are discussed in Table 2. The family history of the disease showed that among the 300 women, 33% of working and 48% non-working women had a family history of the disease. 30% of working women have familial tendency for cardiovascular diseases was prominent among the first degree relatives over the second and third degree relatives. Family history on its own is responsible for as much as 15% of all heart attack. Family members quite often share similar lifestyles and habits which may have an impact on the risk of heart disease (HHC, 2009).

The details of body mass index are depicted in Table 3. The Body Mass Index of the selected women subjects showed that 25 % of working women and 21% of non-working women were graded as Grade I obese and 6% of working

*Table 1. Age wise distribution of the selected working & non-working women subjects*

Age (years)	Working women		Non - working women	
	No.	%	No.	%
20 - 30	102	68	113	75
31 - 40	48	32	37	25

*Table 2. Familial tendency of the selected working & non-working women subjects*

Familial Tendency*	Working women		Non-working women	
	No.	%	No.	%
No family history	100	67	78	52
First Degree	19	13	34	23
Second Degree	14	9	28	19
Third degree	17	12	10	6

\* Multiple response

*Table 3. Body mass index of the selected working & non-working women subjects*

Body Mass Index (BMI)*	Working women		Non-working women	
	No.	%	No.	%
Underweight (<18.5)	Nil	Nil	Nil	Nil
Normal (18.5 - 24.9)	104	69	113	75
Grade I obesity (25.0 - 29.9)	37	25	32	21
Grade II obesity (30.0 - 39.9)	9	6	5	3

\* National Cholesterol Education Program (NCEP, 2001).

*Table 4. Waist hip ratio of the selected working & non-working women subjects*

Waist - Hip Ratio (WHR)	Working women		Non-working women	
	No.	%	No.	%
> 0.8	133	89	149	99
< 0.8	17	11	1	1

\*NCEP (2001)

*Table 5. Type of diet by the selected working and non-working women subjects*

Type of diet	Working women		Non-working women		Chi - Square
	No.	%	No.	%	
Vegetarian	28	19	59	40	15.826 <sup>s</sup>
Ova vegetarian	12	8	11	7	
Non vegetarian	110	73	80	53	

s= Significantly associated

women and 3% of non-working women were Grade II obese which may be critical if not taken care which will lead to other diet related diseases.

The waist hip ratio of the selected women subjects is depicted in Table 4. About 89% and 99% of the working women and non-working women had abdominal obesity, whereas 11% and 1% of working women and non-working women had normal waist hip ratio.

Dietary Pattern is discussed with the type of diet, Fat and oil intake and use of salt. Different types of diet consumed by selected women subjects are shown in the Table 5. From the table it was observed that, 8% of working women and 7% of non-working women were ova vegetarian whereas 73% of working women and 53% of non-working women were non-vegetarians. The data when statistically analyzed for chi-square, the value was (15.826) which showed a positive significance with consumption of non-vegetarian foods and risk of cardiovascular disease.

The type of fats and oils consumed by the selected women subjects is shown in the Table 6. Ghee, a source of saturated fats was consumed by women comprising 55% of working women and 91% of working women. Sesame oil, Sunflower oil and groundnut oil was found to be more popular among the selected women. The use of vegetable oil such as sunflower oil was consumed by the selected women with 65% and 62% of working and non-working women subjects. Corn and rice bran oil were used by a few number of selected women.

The amount of fat used per day for the cooking is given in the Table 7. From the selected women subjects 59% and 53% of working women and non-working women consume three to five teaspoons of fat or oil per day. It is alarming to note that 24% of working and 20% of non-working women consume more than five teaspoons of oil per day.

The quantity of salt used for cooking by the selected women

subjects is discussed in the Table 8. The Table 14 showed that 88% of working women and 99% of non-working women use one tea spoon of salt per day. In statistical analysis, it was found that the chi-square value (16.3) is significantly associated which reveals that increased salt consumption, has increased risk for cardiovascular diseases. Reducing salt intake in the diet could cut the chances of developing heart diseases (Cook, 2006).

Blood pressure of the selected women subjects are discussed in the Table 9. Majority of the women, 85% from working sector and 61% from non-working women sector had normal blood pressure, whereas 12% of the working women and 27% of the non-working women had moderate blood pressure. The present study was supported with Kamath (2003) that hypertension or high blood pressure is a silent disease and is one of the risk factor of cardiovascular disease.

Life style pattern of the subjects include for the study were exercise pattern and stress pattern. The exercise pattern of the selected women subjects showed that 74% of the working women and 51% of the non-working women did not perform any exercise (Fig.1).

The stress pattern of the working and the non working women subjects are discussed in the Table 10. Occupational stress is high among working women rating 27%. Familial stress is high among non-working women which are around 37% and comparatively low as far as working women is concerned which is 17%. Stress was associated with higher levels of an inflammatory marked called C-Reactive protein or (CRP), which has been identified as an indicator for the later development of cardiovascular diseases (The Times of India, 2009).

The young adult working and non-working women on evaluation of the risk was categorized and examined for lipid profile. The selected subjects were assessed through risk scores (Low, moderate, high risk) and is discussed in the Table 11. From the scores calculated, it was found that 18% of working women and 27% of non-working women were in high risk for cardiovascular diseases. 75% of working women and 65% of non-working women had moderate risk for cardiovascular diseases. Only 6% and 13% of working women and non-

Table 6. Type of fats and oils used by the selected working & non-working women subjects

Type of fats and oils*	Working women		Non-working women	
	No.	%	No.	%
Ghee	83	55	136	91
Butter	18	12	13	9
Vanaspathi	15	10	2	1
Sesame oil	23	15	8	5
Groundnut oil	45	30	31	21
Sunflower oil	97	65	93	62
Corn oil	6	4	11	7
Rice bran oil	18	12	20	13

\* Multiple response

Table 7. Amount of fat and oil used per day of the selected working & non - working women subjects

Amount of fat used /day (teaspoon)	Working women		Non-working women	
	No.	%	No.	%
Less than 3	26	17	41	27
3 - 5	88	59	79	53
More than 5 tsp	36	24	30	20

Table 8. Use of salt in cooking by the selected working and non-working women subjects

Quantity of salt (teaspoon)	Working women		Non-working women		Chi square
	No.	%	No.	%	
One	132	88	148	99	16.239 <sup>s</sup>
more than one	18	12	2	1	

*s* = significantly associated

working women were with low risk for cardiovascular diseases. From the scores, it was observed that moderate risk has been increased due to high intake of fat and physical inactivity. When statistical analyzed, the data was found that the chi-square value (6.459) is significantly associated.

The mean lipid profile analyzed for the sub sample is discussed in the Table 12. The mean lipid profile of the selected subjects shows that moderate risk of the working and non-working women had 170.4 and 181.6 mg/dl of the total cholesterol, whereas high risk of the working and non-working women had 217.3 and 222.7 mg/dl of the total cholesterol. The correlation value for lipid profile is 0.656\*\* with positive significance at 1% level. An elevated low density lipoprotein cholesterol concentration is associated with an increased risk of cardiovascular diseases. Most people realize the elevated blood cholesterol is a major risk factor for cardiovascular diseases (Whitney & Rolfer, 2002).

Counselling sessions were given to 150 of working women from the selected IT companies, Textile Mills, LIC employees and for 150 of non-working women in the residential areas. A total of eight sessions were planned for each group of women to make

them understand the basic menu planning for family members, Type and quantity of fat and oils to be used, the form in which fibre intake would be increased, ways of preserving nutrients in the diet modifications. Stress busters such as physical exercise, meditation were also emphasized to the women subjects.

Table 9. Blood pressure of the selected working & non-working women subjects

Blood Pressure			Working women		Non - working women	
			No.	%	No.	%
Blood pressure *	Systole	Diastole				
Normal	<120	<80	127	85	91	61
Pre - Hypertension	120-139	80 - 90	18	12	41	27
Stage-I Hypertension	140-159	91 - 99	5	3	8	12
Stage - II Hypertension	160 +	100 +	Nil	Nil	Nil	Nil

\*(American Heart Association, 2008)

### Conclusion

The study establishes that the dietary habits and lifestyle are the major causes of cardiovascular diseases.

Table 10. Stress pattern of the selected working & non-working women subjects

Stress pattern	Working women		Non-working women	
	No.	%	No.	%
Relaxed & calm	91	61	82	55
Familial stress	25	17	56	37
Occupational stress	40	27	0	0
Neighbourhood stress	8	5	20	13
Environmental stress	9	6	4	3

Table 11. Risk scores for the selected working and non-working women subjects

Scores	Working women		Non-working women		Chi square
	No.	%	No.	%	
Low (<50)	10	7	20	13	6.459 <sup>s</sup>
Moderate (51-100)	112	75	98	65	
High (>100)	27	18	41	27	

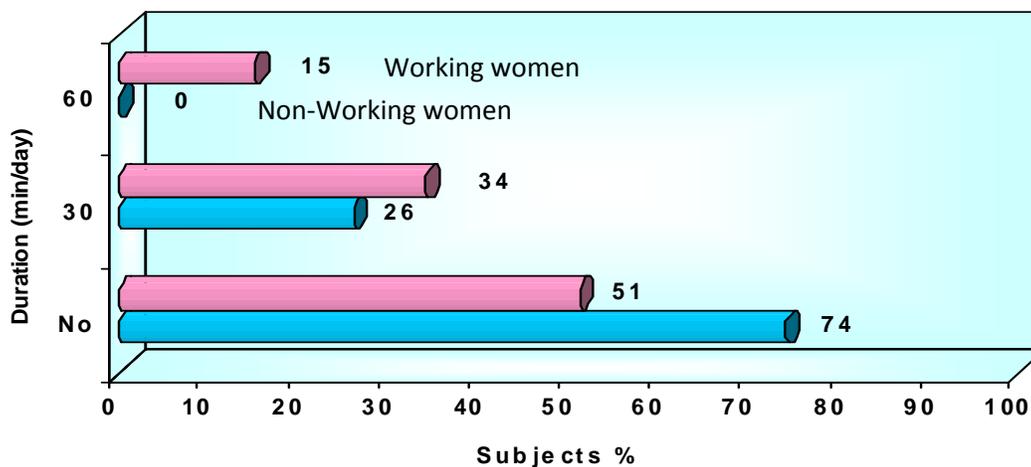
*s = significantly associated*

Table 12. Mean lipid profile of the selected working and non- working women subjects

Lipid profile (Mean value)		Total cholesterol (mg/dl)	HDL cholesterol (mg/dl)	LDL cholesterol (mg/dl)	VLDL cholesterol (mg/dl)	Tri-glycerides (mg/dl)
Normal Values		125 - 200	30 - 65	85 - 130	5 - 40	Upto 160
Low risk (N=12)	Working women (N=6)	155.8	38.7	87.6	18.3	96.3
	Non - working women (N=6)	154.1	39.2	88.8	19.0	96.9
Moderate risk (N=12)	Working women (N=6)	170.4	43.1	102.2	25.3	118.5
	Non - working women (N=6)	181.6	45.9	113.2	28.5	125.9
High Risk (N=12)	Working women (N=6)	217.3	54.7	132.1	30.9	155.6
	Non - working women (N=6)	222.7	53.6	133.8	33.2	161.2

Correlation value : 0.656\*\*

Fig. 1. Exercise pattern of the selected women subjects



Creating awareness among the population groups especially women to adopt nutritious eating habits and healthy lifestyle practices were enlightened. Women were educated to adopt wise food choices through pamphlets, power point presentation emphasizing the inclusion of fibre rich and low fat foods. Familial and occupational stress among the working women and familial stress among the non-working women need to be stressed out through the effective stress busters namely, physical activity, exercise, meditation and positive therapy.

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