RESEARCH ARTICLE

RISK ASSESSMENT FOR HEART DISEASES AMONG TEXTILE MILL WOMEN EMPLOYEES

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ABSTRACT

Modern day changes in lifestyle and dietary pattern have favoured an increase in the occurrence of non- communicable yet chronic and degenerative diseases called as lifestyle diseases. Among the lifestyle diseases, heart diseases occupy a primary place. Changes in lifestyle, rising consumption of sugar, junk foods, animal fat and less physical activity account for the rising global rates of heart diseases. This study was undertaken with the objective to study the risk for cardiovascular disease among industrial women employees. One eighty women in the age group of 20- 40 years working in a textile mill were selected for the study. The selected industrial women were assessed for the risk of cardiovascular diseases using a formulated risk assessment index (RAI).

INTRODUCTION

Heart disease is a major cause of morbidity and mortality in industrialized countries and one of the most important health problems globally. Cardiovascular diseases cause 8.5 million deaths among women annually. It is the largest and single cause of mortality among women, accounting for one- third of all deaths among women worldwide. In developing countries, half of all deaths of women over 50 are due to heart disease and stroke Xavier (2008). Number of productive life lost due to cardiovascular diseases will increase in 2030 for India by 95 percent. About 80 percent of the deaths occurred in low and middle income countries American Heart Association (2008). Women tend to be caregivers, and out of the sense of duty, they have a hard time justifying behavior that are "just for themselves" such as regular exercise, recreation and relaxation Fogorus (2009). Overworking, under-resting and level of frustration at work bring about heath related changes affecting quality of life. The effects of unhealthy diet and physical inactivity raise blood pressure, blood glucose, blood lipids, overweight and obesity, which are the immediate risk factors for heart diseases. Hence, this study was undertaken with the objective to study the risk for heart disease among textile mill workers.

MATERIALS AND METHODS

The methodology adopted for the study comprises of the following steps:

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The area selected for the conduct of the study was Vijayeshwari Textiles a well established textile mill at Coimbatore. Women in the age group of 20- 40 years were selected and thus one hundred and eighty women were selected for risk assessment.

Formulation of a risk assessment index (rai) for heart diseases

A Health Risk Assessment (HRA) is an indicator to estimate the exposure to chances or likelihood of getting a particular disease. It is a questionnaire, used to create awareness among individuals to evaluate their health risks Baker *et al.* (2007). A risk assessment index was developed to predict the extent of risk for cardiovascular diseases among the selected industrial women. The Heart Health Risk Assessment Index (HHRAI) was developed taking into account the common risk factors associated with cardiovascular diseases and women health. The risk assessment index was formulated keeping in mind the risk of an individual based on four main categories. Category I risk factors were anthropometric measurements namely Body mass index and Waist to Hip Ratio, blood pressure and dietary pattern like type of diet, type of fat and oil consumed per day, amount of visible fat consumed per day, snacks, junk food, beverages consumption and salt intake. Category II risk factors were exercise pattern and nature of work or activity pattern. Category III risk factors were psychological factors namely type of personality, stress pattern and meditation pattern and Category IV risk factors were age and family history.

Allotment of scores for heart health risk assessment index (HHRAI)

Individual Scores were allotted for the criteria in the Heart Health Risk Assessment Index. The criteria without risk was scored zero. The criteria with low risk ranked three and for criteria with medium risk five scores were given and the highest risk was scored ten in each criteria. From the total scores obtained the women were categorized under low, medium and high risk category.

Biochemical assessment of lipid profile

As the HHRAI is an indicator for possible risk towards Cardiovascular Diseases an attempt was made to analyse the lipid profile of the high and medium risk women so that the association of the risk with biochemical parameters can be established and the women could be cautioned about early prevention of diseases. For the women with high and medium risk for cardiovascular disease lipid profile namely total cholesterol, triglycerides, high density lipoproteins and low-density lipoproteins was analysed and compared against the reference values of National Cholesterol Education Programme (2005).

Nutrition and lifestyle education

Nutrition and lifestyle education was imparted through visual and non visual aids to impart knowledge on prevention of cardiovascular diseases. Heart healthy foods, fibre rich foods, ill effects of high fat rich food consumption, junk foods and reuse of oil as part of the intervention were stressed. To relax and refresh the minds of the women employees music, yoga and stress management therapy was carried out. Mind refreshing musical CD's was played to create a peaceful atmosphere, Yoga technique's were taught by a yoga instructor and stress management techniques were taught by a psychologist.

RESULTS AND DISCUSSION

A. Background Information and Lifestyle pattern

a) Age wise distribution of women

The age distribution of the women employees is given in Table I

Table I. Age wise distribution of the textile mill women employees

Age (years)	N=180	Percent
20-25	65	36
26-30	31	17
31-35	35	20
36-40	49	27

Among the selected mill workers 36 percent were in the age group of 20 to 25 years, 17 percent employees were in the age group 26 to 30 years, 20 percent women were in age group of 31 to 35years. Twenty seven percent of the women belonged to 36 to 40 years age group. Age is a non- controllable risk factor for Cardiovascular Disease and hence adoption of prevention

strategies at a younger age is always useful. Eighty four women were married.

b) Income Level

Table II indicates the income level of the selected young women.

Table II. Income level

Income level*	N= 180	Percent
>4500	25	14
4500-7000	74	41
>7000	81	45

*(HUDCO, 2010)[6]

Compared with the HUDCO classification fourteen and forty one percent women were under the low economic status. Forty-five percent of women were drawing a salary of Rs. 7000 and their source of income was additional for the family in many cases but some of them were also the sole breadwinners for their family.

c) Family Members

Seventy one percent of women were in the nuclear family and mainly as the Place of work area and economic pressure forces many to stay in nuclear families. Only eight percent of women live in joint families.

d) Family History of cardiovascular disease

Family history of cardiovascular disease is presented in Table III.

Table III. Family history of cardiovascular disease

Family history	N=180	Percent
No family history	137	76
Third degree	20	11
Second degree	9	5
First degree	14	8

Twenty four percent of the textile mill employees had a family history of cardiovascular disease. Family history of Cardiovascular diseases was seen among eight percent of the women that is parents of these women were affected while eleven percent had the third degree risk, Five percent of young women had second degree risk for cardiovascular disease.

e) Type of personality

The type of personality of the women were presented in the Table IV

Table IV. Type of personality

Type of personality	N=180	Percent
Type B	60	33
Type AB	48	27
Type A	72	40

Type B personality was found among 33 percent of women and Type A personality was seen among 40 percent women. Ambitious, aggressive, business-like, highly competitive, impatient and time conscious are the characters of Type A personality persons. Twenty seven percent had the combination of Type A and Type B personalities.

f) Pattern of physical activity

The data on physical activity showed that 28 percent women perform physical activity for more than thirty minutes every day. Physical activity includes all house hold work namely dish washing, washing clothes, sweeping and cleaning. Working at the textile mills (lifting cloth bales, carding and combing of cotton fibres, tailoring) was the ideal physical activity seen among the selected women employees.

g) Meditation Practice
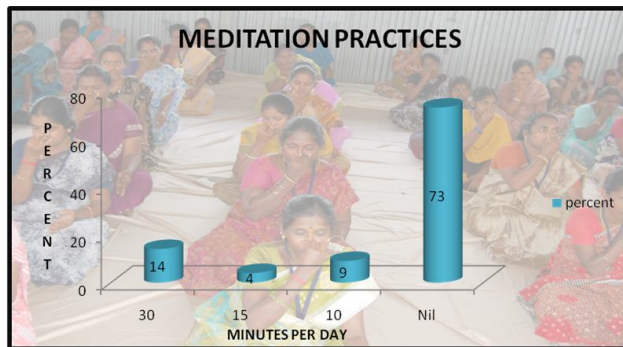
The meditation practices is shown in Figure I.

Figure I. Meditation practices

While exercise, was done by thirty-three percent of the women, only twenty seven percent of the women practiced meditation as a lifestyle practice every day. Being physically active reduces the risk of developing coronary heart disease, stroke and type II diabetes by up to 50 percent and reduces the risk of premature death by about 20 to 30 percent. Regular moderate physical activity and meditation, yogasanas and pranayama may be synergistic in controlling mind-body interactions that are important in the pathogenesis of cardiovascular disease Singh *et al.* (2003).

h) Stress pattern

Table V gives the details of stress pattern.

Table V. Stress Pattern

Stress	N=180	Percent
Relaxed and calm	52	29
Mild stress	34	19
Moderate stress	73	40
High stress	21	12

Forty percent women were moderately stressed because of work at home and at work, with additional stress such as managing children education and family disputes. Health

problems, economic crisis and, family disputes were the common factors that were categorised as high stress.

B.Anthropometric measurement

a) Body Mass Index and Waist to Hip Ratio of the Women

The Body Mass Index and Waist to Hip ratio of the women Employees is presented in Table VI.

Table VI. Body mass index and waist hip ratio of the women

Body Mass Index and Waist Hip Ratio	N=180	Percent	Chi Square Value
Body Mass Index(kg/m^2)*			
Normal (18.5-22.9)	97	54	
At risk of obesity (23-25.0)	60	33	
Grade I Obesity (25.1-29.9)	4	2	58.147**
Grade II Obesity (>30)	19	11	
Waist to Hip Ratio*			
<0.8	77	42	
0.81 - 0.85	34	19	67.418**
0.86 – 0.90	44	25	
>0.90	25	14	

* National Cholesterol Education Program (NCEP, 2001)[8]
**- Significant at 1% level

Thirty three percent of the women were in the at risk category and eleven percent were in Grade II obesity. Though obesity was found to be less abdominal obesity was seen among fourteen percent women. This may be due to lack of physical activity and irregular diet. Adoption of simple day to day measures to maintain ideal body weight will help to cut down the lipid levels in young women Uma Mageshwari and Thilagamani (2011).

C. Details on blood pressure of the women

a) Blood pressure of the Women

The blood pressure of the women is given in the Table VII

Table VII. Blood pressure of the women

Blood pressure(mm/hg)	Systole	Diastole	N=180	Percent	Chi Square Value
Normal	<120	<80	151	83	
Pre- hypertension	129-139	80-90	23	13	
Mild and moderate hypertension	140-159	91-99	5	3	153.07**
Severe hypertension	160+	100+	1	1	

* American Heart Association, 2008
**- Significant at 1% level.

Elevated blood pressure was observed among 17 percent women. Thirteen percent women at pre hypertensive stage, three percent women in the mild and moderate hypertension category and one percent women with severe hypertension. It is estimated that a five-mmHg reduction in systolic blood pressure results in a 14 percent reduction in stroke mortality and nine percent reduction in coronary heart disease mortality and a seven percent decline in all cause mortality. It is also estimated that a ten percent decrease in serum cholesterol

would result in a 15 percent reduction in coronary heart disease mortality Dauchet *et al.* (2007).

D. Dietary pattern of the women

Vegetarianism was noticed only among 12 percent of women, four percent were ova vegetarians and rest (84 percent) was non-vegetarians.

a) Type and Amount of Fats and Oils

The type of fats and oils used is discussed in Table VIII

Table VIII. Type and amount of fats and oils

Type and Amount of Fat	N=180	Percent
Type of Fat		
SFA, MUFA, PUFA	18	10
MUFA and PUFA	118	65
MUFA and SFA	18	10
SFA a major source	26	15
Amount of Visible Fat (grams/ day)		
15	70	39
25	102	56
26-30	8	5

Oil consumption is important in the diet, especially for proper development and absorption of fat soluble vitamins. However a high fat consumption can have adverse effect on health. High fat consumption can lead to obesity and high lipid profile Mgintyre *et al.* (2001). Ten percent of women used combination of oils from saturated fats, monounsaturated fat and polyunsaturated fat. Fifteen percent women used butter and ghee as major source of cooking that may have consequences on health. Pattern of reusing oil was seen among 47 percent of women, 27 percent of women reused oil only once, Seven percent of women reused more than once and 13 percent of women reused till it gets over.

b) Amount of Salt Intake

The amount of Salt used by the women were given in Table IX

Table IX. Amount of salt intake

Salt (grams/day)	N=180	Percent
<5	72	40
6-8	54	30
9-10	43	24
>10	11	6

Among 180 women, 40 percent consumed used less than 5 gm of salt. Dietary salt is a significant factor in raising blood pressure in people with hypertension and in some people with normal blood pressure Kim *et al.* (2010).

e) Consumption of Beverages

The consumption pattern of beverages of the women is given in Figure II. The consumption pattern of beverages shows that only 23 percent of women do not have the habit of consuming beverage such as coffee and tea. Sixty six percent women consumed 3 to 5 cups of beverages per day. Tea was common

beverage consumed more frequently by the textile mill workers.
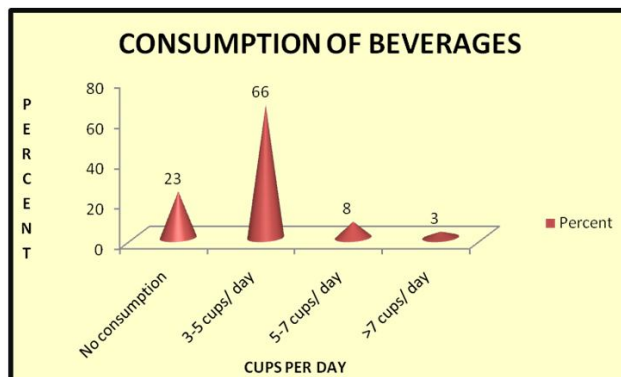
Figure II. Consumption of beverages

f) Consumption pattern of junk foods

The consumption pattern of junk foods showed that 97 percent women had the habit of consuming Junk food (Fried mushroom, gobi manchurian, potato chips) weekly. Eight percent of women consumed junk foods daily and 39 percent women consumed junk foods rarely. Globalisation has increased purchasing power among the consumers and increased fat consumption among low income countries. This has resulted in consumption of energy dense foods, which are however poor in dietary fibre and several micro nutrients Sharma *et al.* (2009).

E. Risk Scores for Cardiovascular Disease

a) The contributing risk factors for cardiovascular disease

The contributing risk factors for cardiovascular disease are given in Table- X. An overall score of 48 and less was categorized as low risk. Scores between 49 and 80 were categorised to be medium risk and scores between 81 to 160 was ranked as high risk for cardiovascular disease.

Table X. Details on high risk for cardiovascular disease

CRITERIA	PERCENT (%)		
	HIGH RISK	MEDIUM RISK	LOW RISK
Age	27	20	17
Familial tendency	8	5	11
Type of personality	Nil	40	27
Pattern of physical activity	35	10	27
Meditation Practices	73	9	4
Stress Pattern	12	40	19
Body Mass Index	11	2	33
Waist to Hip Ratio	14	25	19
Blood Pressure	1	3	13
Type of diet	51	33	4
Type of Fats and Oil	15	10	65
Amount of visible fats consumed per day	-	5	56
Frequency of Reusing oil	13	7	27
Pattern of reusing oil	13	7	27
Amount of Salt Intake	6	24	30
Consumption of beverages	3	8	66
Consumption of junk food	8	50	39

The major contributing factors for women with high risk for cardiovascular disease showed that no regular exercise regimen and consumption of non- vegetarian foods especially red meat were the main risk factors. Consumption of junk food, stress pattern and the type of personality contributed towards the risk.

b) Risk Category of Women

The risk category for cardiovascular disease among the selected women is given in table XI

Table XI. Category of risk for cardiovascular disease

Risk category	N=180	Percent
Low risk	117	65
Medium risk	61	34
High risk	2	1

The risk for cardiovascular disease among the selected women showed that 65 percent were at low risk maintaining desirable heart healthy habits such as diet, physical activity and stress management. The medium risk for developing heart disease was 34 percent pointing out the need to practice lifestyle modifications. Family dietary habits plays a important role in development of heart diseases among medium risk women. Consumption of junk foods must be avoided to prevent the risk of developing heart diseases. High-risk women were one percent indicating the poor quality life with diet and lifestyle habits for whom intervention has to be given at early stage.

Conclusion

The study establishes that the dietary habits such as consumption of junk foods, red meat, saturated fat and lifestyle pattern such as physical inactivity, not practicing yoga and meditation are the major risk factors of cardiovascular diseases. Creating awareness among the population groups especially women to adopt nutritious eating habits and healthy lifestyle practices are important. Women should be educated to adopt wise food choices and change their lifestyle to prevent the major diseases.

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