



## Heart Health Assessment with pattern of Food Intake for Omega 3 Fatty Acids among Young Household Women

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### Abstract

*Cardiovascular diseases are one of the major causes of mortality and morbidity among the population of developing countries like India. The rise in cardiovascular diseases reflects a significant change in diet habits worldwide as a result of industrialisation and globalisation of food market. A total of 100 household women was selected from the urban areas of Coimbatore to assess the heart health and associate with the pattern of food intake for foods rich in omega three fatty acids. A total of six modules were designed to impart education among the study participants which are heart friendly guidelines, healthy food choices, heart friendly recipes, healthy heart, Omega 3 fatty acids and lifestyle management. A checklist was designed comprising Omega 3 fatty acid food frequency record in order to know the impact of education among the study participants. The study participants when assessed at pre and post education on omega 3 fatty acids and cardiac health had a positive impact. Awareness is the vital need of the hour and it emphasizes the awareness and behavioural modification among the population especially the younger groups. Omega 3 fatty acids consumption counteracts the negative associations between fatness and cardiovascular disease risk factors in young overweight and obese adults. A statistically significant decrease in Low Density Lipoprotein and Very Low Density Lipoprotein was reported among the young household women.*

**Keywords:** Cardiovascular disease, Risk Assessment, Omega 3 fatty acids, overweight, lipid profile.

### Introduction

Coronary Heart Disease (CHD) is one of the major causes of mortality and morbidity in the population of developing countries like India. The prevalence of Coronary Heart Disease in Indian subcontinent is presently one of the highest and is further on an increase and India faces a major challenge of adult morbidity and mortality due to cardiovascular diseases like Coronary Heart Diseases and hypertension<sup>1</sup>.

Cardiovascular disease will be the largest cause of death and disability. By the year 2020, India will have the largest cardiovascular death burden in the world which would account for one-third of all deaths<sup>2</sup>.

The rise in cardiovascular diseases reflects a significant change in diet habits worldwide as a result of industrialisation and food market globalization. Hypertension and hypercholesterolemia are among the major and dominant risk factors in the development of cardiovascular diseases. Sixty percent of cardiovascular deaths are due to hypertension and eighty eight percent of the cardiac patients worldwide have hypercholesterolemia<sup>3</sup>.

During the past fifty years, much evidence has documented a relationship between diet and cardiovascular disease risk. Specifically epidemiologic, experimental and clinical trial

evidence has demonstrated a relationship between diet, nutrients and blood lipid levels; blood pressure; and cardiac diseases<sup>4</sup>.

Young women come under the life stage of early adulthood which defines individuals between the ages of twenty and forty and is considered the healthiest time of life<sup>5</sup>. Cardiovascular deaths in men are declining but in women it remains the same or is increasing in women. Of the million heart attacks reported annually, more than five lakhs occur among women<sup>6</sup>.

The first step in lifestyle management is to screen all adults for overweight and obesity. A medical history should be obtained assessing for the multiple determinants of obesity, including dietary and physical activity patterns, psychosocial factors, weight-gaining medications, and familial traits. Emphasis on the complications of obesity to identify patients who will benefit the most from treatment is more useful than using body mass alone for treatment decisions. Weight loss is achieved by creating a negative energy balance through modification of food and physical activity behaviours<sup>7</sup>.

A multitude of studies have been published on the relationship between cardiovascular disease risk and a variety of nutrients, food and dietary pattern. The well-accepted notion is that the diet has a significant influence on the development and prevention of cardiovascular disease<sup>8</sup>.

One specific recommendation in the battle against cardiovascular disease is the increased intake of omega 3 fatty acids, which are polyunsaturated fatty acids. Studies have reported inverse associations of cardiovascular disease with dietary intake of omega 3 fatty acids, suggesting that omega 3 fatty acids supplementation might exert protective effects on cardiovascular disease. They exert their cardio protective effect through multiple mechanisms. Omega-3 fatty acid therapy has shown promise as a useful tool in the primary and secondary prevention of cardiovascular disease<sup>9</sup>.

There is also epidemiological evidence that dietary Mono Unsaturated Fatty Acids (MUFAs) have a beneficial effect on the risk of Coronary Heart Disease. Moreover, evidence from controlled clinical studies has shown that Mono Unsaturated Fatty Acids (MUFAs) favorably affect a number of risk factors for Coronary Heart Disease, including plasma lipids and lipoproteins, factors related to thrombogenesis, in vitro Low Density Lipoprotein oxidative susceptibility, and insulin sensitivity. Risk estimation in young needs more research. Especially, quantification of the expected benefits of multiple risk estimation approach in terms of improved outcomes is still needed<sup>10</sup>. Hence the study was set with the objectives as framed below to associate the heart health (lipid profile) with the intake of omega 3 fatty acids among young women.

## Materials and Methods

**Selection of area and sample:** The area for the conduct of the study was Coimbatore District of Tamil Nadu State as it had easy accessibility and approachability for the investigator. The participants were selected by purposive random sampling. The study was carried out among the women in the age group between 20 and 40 years for the collection of baseline data. A total of 100 household women were selected from the urban areas of Coimbatore. Urban areas were selected for the study due to the higher prevalence of cardiovascular disease risk factors in the urban population. Easy approachability, good response and cooperation from the study participants and the organisation were the reasons for the selection of the area.

**Formulation of tools and collection of data:** Based on the requirement of the study, a detailed questionnaire was formulated and comprised personal, health and nutrition profile about the study participants. A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. The questionnaire comprised of personal, health and nutrition profile.

Awareness on Omega 3 fatty acids was formulated to estimate the knowledge of the study participants on omega 3 fatty acids and cardiac health. Lifestyle pattern comprised the details on type of activity, sleeping pattern, exercise pattern and the type of exercise performed. Six modules were designed to impart education among the study participants which are Heart friendly

guidelines, Healthy food choices, Heart friendly recipes, Healthy heart, Omega 3 fatty acids and Lifestyle management.

A checklist was designed which comprised Omega 3 fatty acid food frequency record and questions relating to omega 3 fatty acids in order to know the impact of education among the study participants. Health profile of the subjects was assessed by anthropometry, biochemical estimation and dietary survey.

The biochemical indices used for the study was blood analysis (lipid profile examination).

**Post analysis:** Nutritional status with specific parameters such as Body Mass Index (BMI) and Waist to Hip Ratio (WHR) were assessed for a sub sample of twenty four young women to check the effect of omega 3 fatty acid foods on anthropometric measurements.

The checklist which was administered to the selected twenty four study participants to estimate the knowledge on omega 3 fatty acids before education was again administered to know the impact of education. The results at post education were compared with the results before education in order to check the impact of education on omega 3 fatty acid food intake on the lipid profile among the selected young women.

## Results and Discussion

**Socio-economic profile:** Socioeconomic profile including age wise distribution, marital status, family type, size of the family, income status of the family are discussed in Table-1.

**Table 1**  
**Socioeconomic profile of the study participants**  
(N=100)

Characteristics	Household women (N=100)
<b>Age wise distribution</b>	
21-25	37
26-30	12
31-35	19
36-40	32
<b>Marital status</b>	
Unmarried	13
Married	87
<b>Family type</b>	
Nuclear	83
Joint	17
<b>Size of the family</b>	
Small (4 members)	74
Large( more than 4 members)	26
<b>Income category</b>	
Below 8000	0
8001-15000	0
15001-25000	2
Above 25000	98

The details on age wise distribution of study participants, it was shown that among household women, thirty seven percent of the participants were under the age group of twenty five years and the least was nineteen percent who were in the age group of 31 to 35 years. The details on the family type of the study participants showed eighty three percent of household women adopted in nuclear type of family system and seventeen percent in household women and six percent in working women opted to joint family indicating the predominance of nuclear family system in the present context.

The details on the size of the family indicates that seventy four percent of household women have small family consisting of less than four members. The monthly income of the families of women shows that high income group dominates among the population group and especially among the Information Technology and Information Technology Enabled Services.

**Food pattern:** Among one hundred women, twenty one were vegetarians, seven were ovo-vegetarians and seventy two were non-vegetarians indicating the predominance of non-vegetarian food habits among the study participants. Several epidemiological studies prove that Non vegetarian foods increase the risk of coronary heart disease.

**Table-2**  
**Preference for fast foods, baked foods and preserved foods**  
N=200

Type of food	Frequency	Household Women (N=100)
		Percent
Fast foods	Daily	0
	Weekly	3
	Rarely	81
	Never	16
Baked foods	Daily	4
	Weekly	78
	Rarely	18
	Never	0
Preserved foods	Daily	93
	Weekly	7
	Rarely	0
	Never	0

The consumption pattern of fast foods among women depicted in the table showed the emerging trend for the consumption of fast foods. The consumption of fast and baked foods was comparatively lesser among the household women. Consumption of preserved foods such as pickles, sauces, jams, canned foods were common among both household and working women.

**Table-3**  
**Type and amount of visible fats and oils consumed per day**

Types of fats and oils	Amount of fats and oils used		
	Less than 10 ml	10-20 ml	More than 20 ml
	Household women (N=100)	Household women (N=100)	Household women (N=100)
Coconut oil (N=61)	19	6	2
Gingelly oil (N=87)	39	10	8
Groundnut oil (N=114)	41	11	0
Palm oil (N=91)	65	19	0
Sunflower oil (N=198)	31	29	6

\*multiple response

The consumption details of fats and oils indicated that sunflower oil was the common type of oil used among the women. It was observed that ninety nine percent of women used sunflower oil. Also it was noticed that palm oil distributed through Public Distribution Systems was also used by women especially household women in smaller quantities less than ten millilitre per day. The study revealed that the use of oil more than twenty millilitre was observed among twelve percent of women. Hence more awareness in type and quantity of oils used by the women needs great emphasis.

**Impact of education:** Anthropometric measurements pre and post intervention.

**Table-4**  
**Anthropometric measurements pre and post intervention**  
N=24

Variable	Initial (Mean $\pm$ S.D)	Final (Mean $\pm$ S.D)	Difference	t-value	Reference standard
Body Mass Index	27.12 $\pm$ 0.98	26.54 $\pm$ 0.89	-0.58	3.02**	18.5-23
Waist to Hip Ratio	0.95 $\pm$ 0.01	0.94 $\pm$ 0.01	-0.01	2.01 <sup>NS</sup>	<0.8

NS- Non Significant, \*\* Significant at one percent level

A statistically significant decrease in Body Mass Index was reported in the subjects. When compared with the reference standard of 18.5 -23 it was observed that initial and final Body Mass Index so obtained was higher. A non significant decrease in Waist to Hip Ratio was observed in the study participants. When compared with the standards i.e. <0.8, it was observed that the initial and final mean values of Waist to Hip Ratio was above the normal range. It was stated that the waist-hip ratio is an independent and dominant risk factor for predicting Coronary Heart disease<sup>12</sup>.

A statistically significant decrease in Low Density Lipoprotein and Very Low Density Lipoprotein was reported. When compared with the reference standards it was observed that Low Density Lipoprotein and Very Low Density Lipoprotein were normal. A non significant increase in total cholesterol, triglycerides and High Density Lipoprotein was also observed. The values of Total cholesterol and triglycerides were increased than the normal range. High Density Lipoprotein was also found to be slightly increased which contributes positively in improving the lipid profile of the study participants.

**Table-5**  
**Lipid profile parameters pre and post intervention**

N=24

Variable	Initial (Mean $\pm$ S.D)	Final (Mean $\pm$ S.D)	Difference	t-value	Reference standard (mg/dL)
Total cholesterol	204.45 $\pm$ 6.64	206.90 $\pm$ 4.39	2.45	1.05 <sup>NS</sup>	<200
Triglycerides	147.35 $\pm$ 8.18	152.35 $\pm$ 7.20	5.00	2.08 <sup>NS</sup>	<150
High Density Lipoprotein	47.80 $\pm$ 1.88	50.20 $\pm$ 1.24	2.40	1.94 <sup>NS</sup>	30-85
Low Density Lipoprotein	125.06 $\pm$ 5.23	102.72 $\pm$ 4.33	-22.34	4.01 <sup>**</sup>	<130
Very Low Density Lipoprotein	40.60 $\pm$ 2.03	37.39 $\pm$ 1.64	-3.21	2.76 <sup>*</sup>	<40

NS Non Significant \*\* Significant at one percent level \*Significant at five percent level

**Table-6**  
**Omega 3 fatty acid food intake pre and post intervention**

N=24

Type of food	Frequency	Before		After	
		Number	percent	Number	Percent
Soy products	Daily	0	0	0	0
	Weekly	0	0	1	4.16
	Rarely	2	8.33	23	95.83
	Never	22	91.66	0	0
Green Leafy Vegetables	Daily	2	8.34	12	50
	Weekly	4	16.66	9	37.5
	Rarely	16	66.66	2	8.33
	Never	2	8.34	1	4.16
Roots and tubers	Daily	1	4.16	12	50
	Weekly	12	50	11	45.84
	Rarely	11	45.84	1	4.16
	Never	0	0	0	0
Other vegetables	Daily	1	4.16	12	50
	Weekly	11	45.84	11	45.84
	Rarely	12	50	1	4.16
	Never	0	0	0	0
Nuts and oilseeds	Daily	0	0	13	54.16
	Weekly	4	16.66	11	45.84
	Rarely	18	75	0	0
	Never	2	8.34	0	0
Fish	Daily	0	0	3	12.5
	Weekly	17	70.84	17	70.84
	Rarely	3	12.5	0	0
	Never	4	16.66	4	16.66

It was observed that the study participants increased the frequency of consuming foods rich in omega 3 fatty acids. Ninety five percent of the participants increased the frequency of consuming soy products. It was reported that fifty percent of the participants started consuming green leafy vegetables, other vegetables, roots and tubers daily after education. It was also observed that fifty five percent of the participants started consuming nuts and oilseeds on a daily basis. Except for vegetarians, all the other study participants increased the frequency of fish in their diet.

## Conclusion

A rapid transformation in the diet and lifestyle pattern of Indians particularly those living in urban India has resulted in rapid escalation of lifestyle diseases. The women populations were not much aware of the association between the omega 3 fatty acids and heart health. The impact of education had positive results on Body Mass Index, Low Density Lipoprotein, and Very Low Density Lipoprotein. The study participants had increased the frequency of foods rich in Omega 3 fatty acid in their diet.

The ever changing diet and lifestyle pattern of the population especially the younger generation need to conquer and practice the golden rule of primordial prevention of lifestyle disorders. Creating awareness among the population to adopt healthy food options comprising smart choices of fats and oils especially visible fats and omega three fatty acids, use of fresh and natural foods and the positive balance in energy intake and expenditure would promote heart health and prevent young women from heart diseases and promote quality of living.

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