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A study on dietary habits of women faculty and impact of nutrition education

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ABSTRACT

Malnutrition due to poor feeding habits, is still a serious public health issue especially among women.

Context: So, awareness about importance of balance diet for a healthy living is needed for them.

Aims: The objective of this study was to assess the dietary patterns of 50 women faculty in Arul Anandar College, Madurai and provide nutrition education and to assess the impact of nutrition education.

Materials and Methods: In this regard the dietary pattern of women faculty were assessed and awareness about healthy diet and stress free life using various modes were imparted and the impact was assessed using KAP.

Results: Dietary pattern assessment revealed that, most study participants were non vegetarians and consumed three meals a day, pressure cooking was the predominant method adopted for cooking cereals and pulses. Inadequate intakes of pulses, green leafy vegetables, other vegetables, fruits, milk and milk products were observed. Frequent intake of carbohydrate rich foods, fats and oils but an infrequent intake of protein rich foods and vitamin and minerals rich foods in a week. Malnutrition were linked to low intakes of pulses and beans; milk and dairy products; vegetables and fruits food groups. After nutrition education, the scores for knowledge and attitude have increased than scores for practice.

Conclusions: Women of the study population had an unhealthy dietary pattern. So, nutrition education were provided and the impact was assessed using KAP scores and after the education KAP scores have increased than before.

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1. Introduction

Good nutrition is the basic component of good health. When diet provides the nutrients in incorrect amounts, it results in an imbalance of nutrients in body. it may develop into a severe problem which may even prove fatal. Eating properly and balanced diet helps to be healthy and contribute to increase work production. For these reasons, the determination of relations between working individuals' eating habits is substantial for both protecting physical health and making contributions to improve work peace, productivity by proper eating habits. The purpose of the

study is to analyze the eating habits of women working in the college.

Most important determinants of the women's nutrition knowledge were educational level and their kind of occupation. Women who had better knowledge of nutrition also exhibited better dietary behavior, thus underlying the importance of nutrition education for improving dietary behavior. Thus, nutrition education offers a great opportunity to individuals to learn about the essentials of nutrition for health and to take steps to improve the quality of their diets, thus their well being and have a healthy life.¹ Women Professors, the backbone of family and society least bothered about their own health and considering their

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families health and nutrition, mostly do not consume their meals on right time. In this sense, it is necessary to carry out studies to evaluate their eating habits, which can be affected due to the exhaustive work routine. Thus, Providing Nutrition Education to women will make more heal thier women and their families.

In view of this, the hypothesis of this work was to assess the eating habits and providing nutrition education to the women professors. Hence, A study on Dietary habits of women faculty and impact of Nutrition Education” is framed and carried out with the following objectives.

2. Objectives

1. Study the Dietary habits of women faculty in Arul Anandar College.
2. Create awareness about Healthy Diet and stress free life among women faculty.
3. Impart nutrition education using various modes.
4. Assess the impact of nutrition education using KAP on target groups.

3. Materials and Methods

3.1. Dietary survey

The aim of dietary survey is to find the nutrient intakes of individuals. The 24-hour recall method has been widely used in population studies, to find out the quantity of foods consumed. Questions are asked about each eating occasion, starting with early morning going through the entire day and including night time. The cooked amount of each food item consumed by the subject was then converted back into raw foodstuff using the formula given below. These raw quantities of various food stuffs consumed through different food preparations were calculated and summed up so as to obtain the total consumption of a particular food item during the past 24-hour period.

The nutrient intake was computed for the individuals (N-50) using the food composition table as per Nutritive Value of Indian Foods² and compared with their recommended dietary allowances. Data regarding the diet consumed by the different categories of the population, information on meal pattern, frequency of food consumption, eating behavior, food and nutrient intake and food preferences of the women were obtained. Details regarding food and dietary pattern were assessed and intake of nutrients was computed from the Tables of Food composition.³

3.1.1. Food frequency

Qualitative and quantitative assessment of food intake is a technique used for the assessment of nutritional status as it furnishes useful indications about dietary inadequacies. Food consumption survey helps to elicit the quality and quantity of food consumed by the individual.⁴ The type of various foods and the frequency of food consumption over

a period of time was assessed using an interview schedule.

3.1.2. Assessment of 24 hour food recall

Food consumption is one of the important determinants of nutritional status. Hence dietary assessment forms an integral part of nutrition survey.⁵ Diet surveys constitute an essential part of any complete study of nutritional status of individuals or group providing essential information on nutrient intake levels, sources of nutrients, food habits and attitudes. In the present study, through the 24 hour food recall method, the amount of raw ingredients used for cooking, the total amount of food consumed by the individuals were measured using standard cups and utensils⁶ and recorded for the 50 women. The average food intake was calculated and compared with the suggested allowances of ICMR (2010).

3.2. Imparting nutrition education

Only through education can a long-term result be expected from a development programme. The aim of nutrition education is to guide people to choose optimum balanced diets, and promote good dietary habits. Nutrition education is a major intervention for the prevention of malnutrition, promotion of health and improving the quality of life.

In the present study, nutrition education was given to women faculties as creating awareness to women is creating awareness to the whole a family.

3.2.1. Audio- visual aids

Charts and posters with pictures denoting do's and don'ts in food preparation were prepared using colourful pictorial depictions to enhance the attractiveness and facilitate easy understanding.

3.2.2. Exhibition

Inexpensive and locally available nutritious food items and recipes rich in iron, beta- carotene, calories, protein and fibre were prepared separately and displayed. Their nutritional benefits were explained to the women faculties who visited the exhibition.

3.2.3. Awareness on nutri garden

The main purpose of the nutri garden was to enhance the availability and consumption of micronutrients. A nutri garden model was developed by the investigator with inputs from the Department of Horticulture, with basic vegetation and explained to the women faculty.

3.3. Impact evaluation

3.3.1. Evaluation of the effect of intervention by knowledge, attitude and practice

A detailed questionnaire of 60 questions was formulated with 20 questions in each aspect related to nutritional

knowledge, attitude and dietary practices and data were collected from the women faculty before and after nutrition education. Knowledge aspects comprised of questions regarding knowledge of food and nutrients and their functions. Attitude questions covered the importance of nutrition and need for nutrition education. Questions related to practices mainly comprised of daily dietary intake and practices relating to hygiene and sanitation.

A tentative score was allotted for each question, giving equal weight age. In the case of yes or no questions, the correct alternative was given full scores and the other was given zero. The only exceptions were questions pertaining to practices where a gradation was given with the most desirable practice given full score and the least desirable, graded zero. These final scores were further analyzed statistically to evaluate the KAP level of all the selected mothers and care takers.

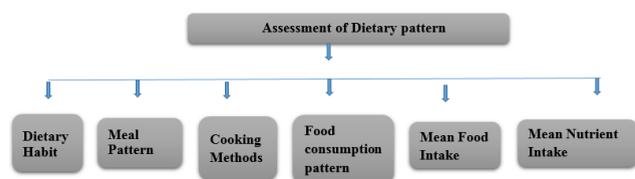


Fig. 1: Assessment of dietary pattern among women faculty

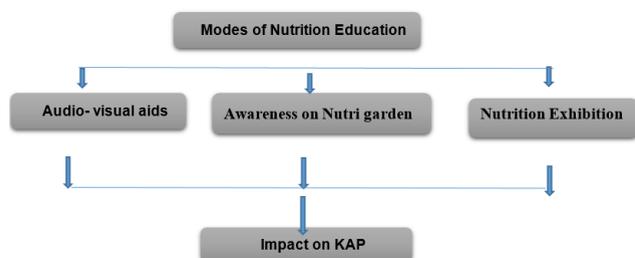


Fig. 2: Nutrition education and its impact

4. Results

4.1. Dietary pattern of the selected women faculty

Details regarding the type of diet consumed, daily meal pattern, frequency of food consumption, cooking methods used are tabulated and discussed in the following pages.

4.1.1. Dietary habit

The type of diet followed by the women faculty is depicted below in Figure 3.

From the above table it was clear that 88 per cent of the women faculty were non vegetarian, and only 12 per cent were vegetarian. Overall the percentage of subjects consuming non vegetarian were higher when compared to vegetarian and ova vegetarians. People are interested

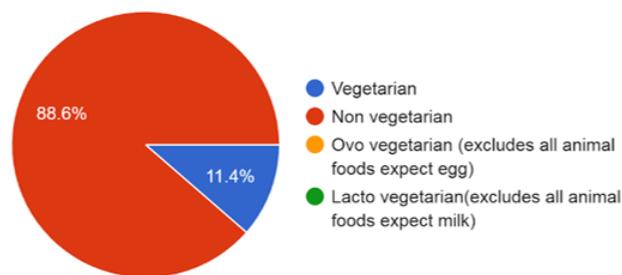


Fig. 3: Dietary habit

to consume non-vegetarian foods because of the taste preference foods than vegetarian.

4.1.2. Meal pattern

The meal pattern followed by the women faculty is given in Figure 4.

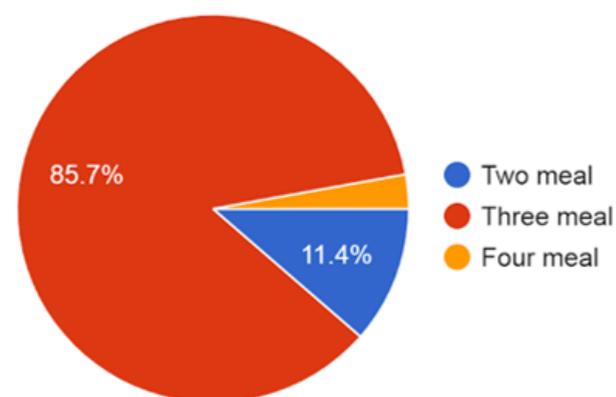


Fig. 4: Meal pattern

The meal pattern adopted by the women faculty revealed that a great majority of 85.7 per cent consumed 3 meals a day because of their pattern of work and regular eating timings. Whereas 11.4 per cent followed 2 meal pattern. Only 2.9 per cent had four meals a day.

4.1.3. Cooking methods

Details of the methods adopted for cooking different foods is given in Table 1.

The predominant method adopted for cooking all food items by the women was pressure-cooking and boiling. Nearly 51.4, 65.7 and 11.4 percent pressure cooked, 42.9, 31.4 and 65.7 percent boiled and 5.7, 2.9 and 8.6 percent steamed cereals, pulses and vegetables for consumption. About 25.7, 22.9 and 2.8 percent roasted, shallow fat fried and deep fried non vegetarian foods.

Table 1: Cooking methods (N=50)

Foods	Pressure cooking		Boiling		Steaming		Roasting		Shallow fat frying		Deep fat frying	
	No	%	No	%	No	%	No	%	No	%	No	%
Cereals	26	51.4	21	42.9	3	5.7	-	-	-	-	-	-
Pulses	33	65.7	16	31.4	1	2.9	-	-	-	-	-	-
Vegetables	6	11.4	33	65.7	4	8.6	3	5.7	4	8.6	-	-
Non Vegetarian Foods	-	-	24	48.6	-	-	13	25.7	12	22.9	1	2.8

4.1.4. Food consumption pattern

The consumption pattern of various foods such as grains, pulses, vegetables, fruits, dairy products, water and snacks is given in Table 2.

Table 2: Food consumption pattern by the women faculty

No of servings/ Day	Total	
	N	%
Grains		
4- 6 servings	35	70
6-11 servings	15	30
Pulses		
< 4 servings	37	74
4- 6 servings	13	26
Vegetables		
< 3 servings	36	72
3 – 5 servings	14	28
Fruits		
< 2 servings	45	90
2-4 servings	5	10
Diary products		
< 2 servings	16	32
2-4 servings	34	68
Water		
2-4 glasses	27	54
4-8 glasses	23	46
Snacks		
1 servings	33	66
2 servings	17	34

Note: 1 serving =1 slice. Bread, 1/3 cup oat meal, rice or grain products, 1cup of raw or 1 cup of cooked vegetables, 1 piece of fruit, 1 cup of milk

Among the selected subjects 70 per cent consumed 4-6 servings of grains per day and 30 per cent of them consumed 6-11 servings/ day. With regard to the consumption of pulses, majority (74 per cent) consumed only < 4 servings and only 26 per cent of the selected subjects consumed 4-6 servings per day. Selected women faculty also consumed vegetables and fruits as part of their daily diet. Nearly 28 per cent of the subjects consumed 3-5 servings of vegetables per day, whereas only 72 per cent consumed < 3 servings of vegetables respectively per day. It was noted that 10 per cent of the selected subjects consumed at least 2 servings of fruits daily. Around 90 per cent included fruits for 2-4 servings in their regular diet. Dietary fiber is an important part of

diet and is present in cereals, pulses, vegetables and fruits. Intake of 25 g of fibre per day per 1000 calories of food is considered to be optimum for a daily diabetic diet.⁷ Fruits and vegetables may play a protective role as they are rich in nutrients and other components such as antioxidants and fibre that are believed to be protective foods. Data regarding the consumption of dairy products revealed that 68 per cent consumed 2-4 servings and only 32 per cent consumed more less than 2 servings per day. They are consumed in the form of milk added with tea, coffee or any beverages and also in the form of curd or buttermilk. Water consumption is very important aspect in our daily life. With regard to water intake 46 per cent and 54 per cent of female drink atleast 4-8 glasses and 2-4 glasses water respectively. With regard to the consumption of snacks a great majority of 66 per cent and 34 per cent of them consumed at least 1 to 2 servings of snacks daily.

4.1.5. Consumption pattern of dairy products

The consumption pattern of dairy products by the selected obese subjects is given in the Table 3.

The dairy products such as milk, curd, buttermilk, paneer and cheese were categorised according to their fat content as low, medium and high fat products. The consumption of skimmed milk powder was categorised under the low fat products.

From the Table 3 it was evident that 20 per cent consumed 100 g of low fat milk every day, whereas only 12 and 3 percent of them consumed < 100g and > 100 g of low fat milk respectively. Similarly 20,30 and 3 per cent of them consumed 100g, < 100g and > 100g of medium fat milk (standard milk or toned milk) per day respectively. Also 28 per cent consumed < 100g of low fat curd everyday, 24 per cent consumed 100g of low fat curd per day whereas only 4 per cent were taking > 100g of low fat curd. It is surprising to see that none of the selected subjects consumed high fat milk.

Among the women faculty it was observed that 50 per cent of them were consuming more than 100g of low fat buttermilk. The high fat food paneer and cheese are consumed by 10 and 4 per cent of women faculty respectively. They were having these foods occasionally when they have family get together or functions.

Table 3: Consumption pattern of dairy products

Diary products	Quantity consumed/ day					
	<100gm		100gm		>100gm	
	N	%	N	%	N	%
Milk						
Low fat*	6	12	10	20	6	3
Medium fat	10	20	15	30	6	3
Curd						
Low fat*	14	28	12	24	2	4
Medium fat	6	12	7	14	4	8
Buttermilk						
Low fat*	1	2	8	16	25	50
Medium fat	3	6	6	12	5	10
Paneer						
High fat	-	-	5	10	-	-
Cheese						
High fat	-	-	2	4	-	-

*Skimmed milk-low /zero fat

Table 4: Frequency of consumption of flesh foods

Frequency	Female	
	Number	Percent
Daily	1	2
Twice a week	11	22
Once a week	30	60
Occasionally	8	16
Total	50	100

4.1.6. Consumption of flesh foods

The frequency of flesh food consumption is given below in Table 4.

Flesh foods consumed by the women faculty were chicken, fish and mutton. Among these foods chicken was consumed by majority of them, whereas 60 per cent consumed once in a week, and only 2 per cent of them consumed daily.

4.2. Type and quantity of fats and oils

Various types of fats and oils such as sunflower oil, groundnut oil, olive oil, palm oil, rice bran oil, coconut oil, gingelly oil and ghee were used for cooking. The types and quantity of fats and oils consumed are Table 5.

Cold pressed oil was used by majority of the women faculty. Around 56 per cent of them used < 25 ml of sunflower oil per day. Similarly 26 per cent consumed 25 ml of sunflower oil every day. Sunflower oil was consumed by 8 and 10 per cent as < 25 ml and 25 ml every day. Groundnut oil was also consumed by 24 per cent of them on an average of < 25 ml per day. Similarly 14 per cent consumed 25 ml of groundnut oil daily and this indicates that the subjects were well aware of the benefits of these oils towards healthy heart. Only 2 per cent consumed < 25 ml and 25 ml of olive oil per day respectively and 4 and 2 per cent of consumed < 25ml and 25 ml of rice bran oil per day

respectively. Only 2 per cent used coconut oil per day, as it was a habit and taste preference which they were not willing to change. It was happy to note that vanaspathi and ghee users were very meagre in both the sexes. With regard to the quantity consumed most of the subjects used less than 25 ml, whereas only minimum per cent of subjects used 25ml per day. It was happy to note that people are health conscious and consumed right type and quantity of fats and oils.

4.2.1. Mean food intake

Among women faculty, cereals and millets were consumed at 90.9 to 92.6 per cent of the suggested allowances (ICMR, 2009). Notably inadequate intakes were observed for pulses (60 to 64 per cent), green leafy vegetables (52 to 60 per cent), other vegetables (44 to 57.5 per cent), fruits (54 per cent) and milk and milk products (52 to 52.4 per cent) as compared to the suggested allowances of ICMR (2009).

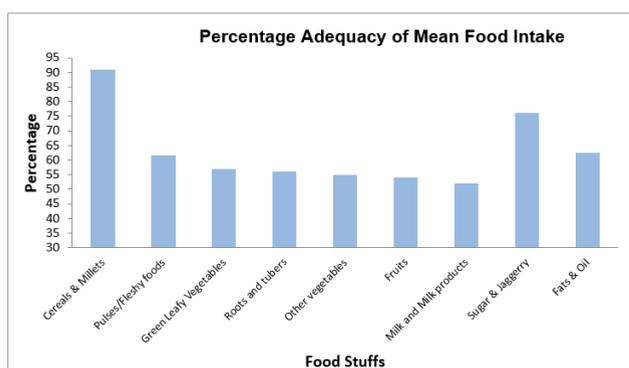
4.2.2. Mean nutrient intake

The adequacy of the diets of women faculty in terms of energy (90.1 to 92 per cent), protein (60.1 to 64.5per cent), fat (51.4 to 60 per cent), calcium (56.3 to 62.5 per cent), especially micronutrients such as Vitamin A (49.7 to 50.8per cent), b-Carotene (52.1per cent), iron (44.4 to 57.1per cent), thiamine (45.5 to 57.1per cent) and vitamin C (62.5 to 75per cent) revealed that they were grossly

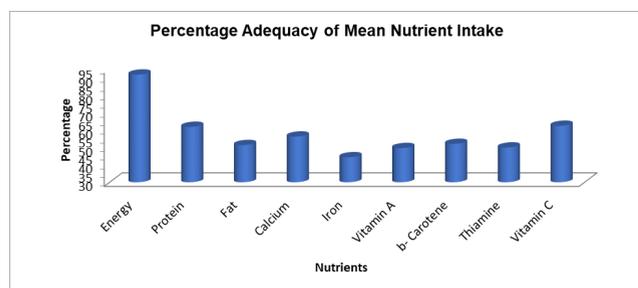
Table 5: Type and quantity of fats and oils

Type of fats and oils*	N	(N-50)			
		<25ml		25ml	
		N	%	N	%
Cold pressed oil	28	13	56	26	26
Sunflower oil	4	5	8	10	10
Groundnut oil	12	7	24	14	14
Olive oil	1	1	2	2	2
Palm oil	1	1	2	2	2
Rice bran oil	2	1	4	2	2
Coconut oil	1	1	2	2	2
Gingelly oil	7	5	14	10	10
Vanaspathi & Ghee	1	0	2	0	0

*Multiple responses

**Fig. 5:** Represent the mean daily food intake of the children and percentage adequacy in comparison with the suggested allowances of ICMR (2009)

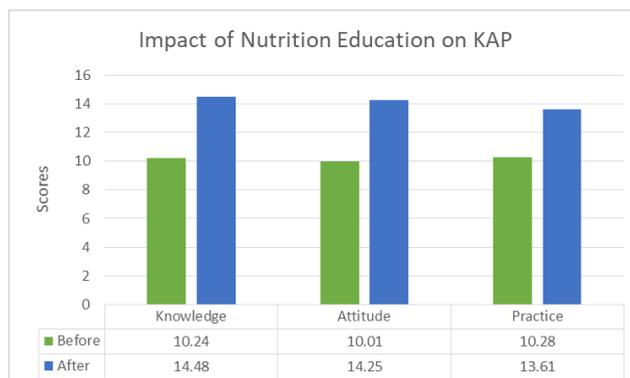
inadequate.

**Fig. 6:** Represent the mean daily nutrient intake of the women faculty.

4.3. Impact of nutrition education

4.3.1. Impact of nutrition education on KAP

Nutrition education was given to the women faculty and the scores for Knowledge had increased from 10.24 to 14.48 with the difference of 4.24, the scores for attitude had increased from 10.01 to 14.25 with the difference of 4.24

**Fig. 7:** Represents the impact of nutrition education on KAP

and the scores for practice had increased from 10.28 to 13.61 with the difference of 3.33. The scores for knowledge and attitude have increased than scores for practice.

According to Rekha⁸ (2012) health and nutrition education provides constructive opportunities for knowing and involving some communication designed to improve health and nutrition literacy thereby improving their knowledge and helps to develop skills which are conducive to community and the individual involved. On hundred adolescent girls in Korea on healthy nutritional practices showcased that teaching was effective in increasing the nutritional attitude, knowledge and practice of the learners.

5. Discussion

Most of the women faculty were non vegetarians and consumed 3 meals a day. Pressure cooking and boiling was the predominant method adopted for cooking cereals and pulses. Regarding water intake, they drink 4-8 glasses of water and consumed 1 to 2 servings of snacks daily.

It was observed that 50 per cent of them were consuming more than 100g of low fat buttermilk. The high fat food paneer and cheese are consumed by 10 and 4 per cent of women faculty. They were having these foods occasionally

when they have family get together or functions.

Cold pressed oil was used by majority of the women faculty. With regard to the quantity most of them used less than 25 ml, per day. It was happy to note that people are health conscious and consumed right type and quantity of fats and oils. Flesh foods consumed by the women faculty were chicken, fish and mutton. Chicken was consumed by majority of them, whereas 60 and 2 per cent consumed once in a week, and daily respectively.

Among women faculty, cereals and millets were consumed at 90.9 to 92.6 per cent of the suggested allowances. Notably inadequate intakes were observed for pulses (60 to 64 per cent), green leafy vegetables (52 to 60 per cent), other vegetables (44 to 57.5 per cent), fruits (54 per cent) and milk and milk products (52 to 52.4 per cent) as compared to the suggested allowances of ICMR.

The adequacy of the diets of women faculty in terms of energy (90.1 to 92 per cent), protein (60.1 to 64.5 per cent), fat (51.4 to 60 per cent), calcium (56.3 to 62.5 per cent), especially micronutrients such as Vitamin A (49.7 to 50.8 per cent), b-Carotene (52.1 per cent), iron (44.4 to 57.1 per cent), thiamine (45.5 to 57.1 per cent) and vitamin C (62.5 to 75 per cent) revealed that they were grossly inadequate.

Nutrition education was given to the women faculty and the scores for Knowledge had increased with the difference of 4.24, the scores for attitude had increased with the difference of 4.24 and the scores for practice had increased with the difference of 3.33. The scores for knowledge and attitude have increased than scores for practice.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Robinson CH, Lawla MR, Chenoweth WL, Garwick AK. Normal and Therapeutic Nutrition. 20th ed. Macmillan Publishing Company; 2003. p. 355–8.
2. Nutritive Value of Indian Foods. Hyderabad: National Institute of Nutrition; 2012.
3. Gopalan C, Sastri BVR, Balasubramanian SC. Nutritive value of Indian Foods. India: National Institute of Nutrition, Indian Council of Medical Research; 2009.
4. Sharma B, Mitra M, Chakrabarty S, Bharati P. Nutritional status of pre-school children of Raj Gond- a tribal population in Madhya Pradesh, India. *Mal J Nutr.* 2006;12(2):147–55.
5. Deshpande PV, Anupama V, Wasu, Mujumdar S. Knowledge Level About Health Practices Among Rural Women. *Mah J Exten Edu.* 1994;18:311–2.
6. Kapil U, Sachdev HP. Status of micronutrient malnutrition in India and intervention strategies to combat them. *Indian J Pediatr.* 2004;69:585–7.
7. The Importance of Class and Money - A Marxist Analysis of Jane Austen's Persuasion [Internet] [Dissertation] Högskolan i Halmstad/Sektionen för Humaniora (HUM); 2009. Available from: <http://urn.kb.se/resolve?urn=urn:nbn:se:hh:diva-2514>.
8. Sinha R, Sharma B. Impact of Nutritional Intervention on the Selected Tribes in Jharkhand. *Indian Res J Ext Edu.* 2013;13(1):123.

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