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Food consumption pattern and dietary intake of women in food enterprise

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Abstract

A study was conducted to elicit the information on food consumption pattern and dietary intake of 120 women entrepreneurs in food enterprise of Tumkur (n=60) and Bangalore Urban (n=60) districts of Karnataka, India. Entrepreneurs were categorized as small, medium and large size enterprise based on the capital investment. The results revealed that, majority of entrepreneurs of all the categories in both the districts were in the habit of consuming three meals per day. More than 78.3 and 55.5 per cent were vegetarians and 21.7 and 45 per cent were non-vegetarians in Tumkur and Bangalore district, respectively. In Tumkur district, across all categories of enterprises, consumption of cereal exceeded the RDA. The mean adequacy of pulses (75.3%), green leafy vegetables (81.4%), other vegetables (87.5%), fruits (62.7%), sugar and jaggery (99.3%), fats and oils (97.2%) was recorded and least per cent was observed in fish and flesh foods (45.8%) when compared to RDA. In Bangalore district, mean adequacy of cereal exceeded the RDA in large and medium categories except small size entrepreneurs (99.5%). Consumption of other food groups was found to be more than 50 per cent of RDA across all categories of enterprise. On the whole, consumption of milk and fish and flesh foods by the women entrepreneurs was less than 50 per cent of RDA levels in both the districts. However in all categories of food consumption, marginal difference was observed and mean adequacy were less than RDA. Hence it can be concluded that nutrition education should be made use to address the issues of nutrient deficiencies and work capacity by educating women entrepreneur on importance of food and nutrition, good health and productive life.

Keywords: Women Entrepreneurs, dietary intake, nutritional status, food enterprise

Introduction

Women play a very important role in the development of family, community and society at large. Women contribute to development not only through remunerated work in the production of goods and services for the market and household consumption, in agriculture, food production or family enterprise, but also through a great deal of unremunerated work (Verma, 2003) [6]. Dietary pattern plays a significant role in human health. Improper and inadequate dietary intake pattern especially in women have resulted in the deficiency of essential nutrients. The health of an individual is known to be influenced by nutritional status. Nutritional status is an indication of the overall well being of a population. Adequate nutritional status of women is important for good health and increased work capacity (Shiva Bhandari *et al.*, 2016) [4]. In a developing country like India, nutritional status is directly related to several factors including; levels of education, standard of living and social status (Vatsala L. *et al.*, 2017) [5]. Thus it could be said that over nutrition is widely prevalent among high socio economic status and under nutrition among low income category. Generally, at household level, cultural norms and practices and socio-economic factors determine the extent of nutritional status among women. While malnutrition is prevalent among all segments of the population, poor nutrition among women begins infancy and continues throughout their lifetime. Because of prevailing culture and traditional practices in India, the health and nutritional status of women becoming worse effected. In India women take a major share of managing the food security of families as they are responsible for cooking and feeding all the family members apart from decision making. However, they also tend to neglect their own health as priority is placed on taking care of others. Finally, a women's health affects the household economic well being, and as a women with poor health will be less productive in the labour force (Mallikharjuna Rao *et al.*, 2010) [3]. Therefore, the present study was undertaken in order to explore the diet and nutrition profile of women in food enterprise in Tumkur and Bangalore Districts, Karnataka, India.

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Material and methods

Women entrepreneurs in food sector were identified with the help of developmental departments and other organizations working towards organizing Entrepreneurship Development Programmes (EDPs) in Tumkur and Bangalore Urban districts. About 120 respondents were randomly selected from different taluks of Tumkur and Bangalore Urban Districts of Karnataka and based on the capital investment on food enterprise they were classified into small, medium and large size enterprise (Table 1). The quantitative data was collected with the help of semi-structured questionnaire on general information such as age, education, land holding, crops grown, size of family and family income were collected and food consumption pattern and dietary practices of women entrepreneurs was recorded by food frequency questionnaire and 24 hours recall method and data was statistically analyzed.

Results and discussion

Classification of food enterprises based on capital investment

In Tumkur and Bangalore Urban districts (Table 1), majority of women entrepreneurs belonged to small (68.3% and 71.7%) followed by medium (25% and 8.30%) and large (6.7% and 20%) size enterprise, respectively. Irrespective of districts majority of entrepreneurs belonged to small size enterprise.

Crops grown by women entrepreneurs family

The crops grown by women entrepreneur family is indicated in Table 2. The major crops of Tumkur district were finger millet, paddy, red gram, green gram, horse gram, cowpea, field bean, castor and vegetables. Commercial crops were coconut, areca nut, banana and mango. Few entrepreneurs of Bangalore Urban district were growing crops like paddy, finger millet, green gram, coconut and areca nut in their native place and use their own produce for entrepreneurship activity.

General information of women in food enterprise

The general information of the women in food enterprise is presented in Table 3

Age: Majority of women entrepreneurs in both the districts were found to be in the middle age group of 36-50 years, followed by young age (18-35 years) and old age group of above 50 years.

Education: Majority of women entrepreneurs were literate in both the districts and less percent were illiterate (10%) in Tumkur district. Irrespective of category of enterprises majority of women entrepreneurs had studied up to Pre-University (41.7%) in Tumkur and up to high school (36.7%) in Bangalore. Higher percentages (35%) of graduate entrepreneurs were in Bangalore district. Entrepreneurs in Bangalore Urban district have better opportunities, educational facilities, better socio-economic conditions of the parents and awareness about educational importance for women.

Family size: Majority of women entrepreneurs belonged to medium size family of 4-6 members (58.1 and 61.7%) followed by small of up to three members (25.6 and 21.7%) and large size family of above 7 members (8.3 and 16.7%) in Tumkur and Bangalore urban district, respectively.

Family income: It is clear from the study that in both the districts majority of entrepreneurs families monthly income was above Rs. 3,000 followed by medium income and low income of below Rs. 2,000 (only in Tumkur district). Unequal distribution of income in the study area is due to inequalities in land asset distribution, job availability, educational qualification, family size, nature of main occupation was responsible for the difference in family income.

Health problems faced and precautionary measures taken by entrepreneurs

The occurrence of the health problems among women entrepreneurs in the study area was less and is presented in Table 4. The common health problems reported among women was back pain, blood pressure and diabetes. It was found that 10 per cent of Tumkur district entrepreneurs were suffering from back pain and found to be major in large size category, where entrepreneurs suffered from back pain (50%) and blood pressure (50%). In Bangalore district majority (41.7%) were suffering from back pain. Women in medium category were suffering from diabetes (40%) and back pain (20%). This may be due to considerable amount of work load on women who spend 8 to 9 hours at work, life style and food consumption pattern. This was in conformity with the findings of Jain and Singh (2013) who reported that more than three-fourths of the women were frequently victimized for the health problems. Majority of entrepreneurs who were having health problems were taking precautionary measures to combat problems by walking, yoga, exercise and through medicines.

Food consumption pattern of women entrepreneurs

The result (Table 5) revealed that, majority of (78.3 and 55%) were vegetarians and 21.7 and 45 per cent were non-vegetarians with the habit of consuming 3 meals a day in Tumkur and Bangalore Urban district, respectively.

Monthly average food consumption by the entrepreneur's family

Dietary pattern of entrepreneurs household (Table 6) in all the categories was mainly cereal based. In Tumkur district an average consumption of cereals ranged between 49.1 to 51.3 kg and pulses 6.5 to 7.2 kg and found less in small size category of total family members of 4 to 5. The average monthly household consumption of green leafy vegetables and other vegetables was almost on par in small (10 and 20 kg), medium (10.6 and 21.3 kg) and large (10.7 and 21.5 kg) category of enterprises. The average monthly consumption of fruits was 7.5, 7.8 and 8kg, milk and milk products was 16, 19.5 and 22.5 liters and fish and flesh foods was 2.0, 2.8 and 3.5 kg by entrepreneurs family belonging to small, medium and large categories, respectively. The average household monthly consumption of other foods like fats and oils was 2.4, 2.8 and 3.1 litres and sugar and jaggery was 3.2, 3.8 and 3.8 kg of entrepreneurs family belonging to small, medium and large categories, respectively. In Bangalore district, similar pattern of consumption of all the foods was observed in all categories, although marginal difference existed in quantity of cereal consumption. The monthly household consumption of pulses was on par with all categories of enterprises and it was least in small size enterprises (8.4 kg). The average monthly consumption of green leafy vegetables was 11.3 kg and other vegetables was 22.7 kg in small size category, which was least compared to large and medium entrepreneurs.

The average consumption of fruits (12.3 kg), fish and flesh foods (4.0 kg) and fats and oils (3.7 litres) was higher in large compared to small and medium. Whereas milk and milk products (20.1 litres) and sugar and jaggery (4.1 kg) consumption in medium and large were in equal proportion.

The average monthly household consumption of all the food groups were less in small size category of enterprises compared to medium and large size category of entrepreneurs. The difference is mainly due to the difference in income levels, land holdings, earning capacity and also difficulty in accessibility and affordability of other foods except cereals.

Food consumption and adequacy of diet in comparison with RDA

The comparison between actual consumption of food items against the Recommended Daily Allowance (RDA) is presented in Table 8 and 9. The major food groups consisted of cereals, pulses, vegetables, fruits, milk, fish and flesh foods, fats and oils and sugar and jaggery. The mean consumption pattern of different food groups by entrepreneurs shows that cereal constituted the single largest group across all the categories. As expected the lowest level of consumption was observed from small size category of enterprise.

The mean consumption of pulses, green leafy vegetables, other vegetables, fruits, fats and oils and sugar was less than

RDA. As per National Nutrition Monitoring Bureau (NNMB, 2002) report rural and urban communities are subsisting on inadequate diets, both in terms of quality and quantity leading to protein, energy and micro-nutrient malnutrition.

The mean consumption of milk and milk product and fish and flesh foods were less than 50 per cent of RDA. As milk and meat form the high priced food items, they pose difficulty in accessibility by majority of the households who have derived low income.

On the whole, mean consumption of all the food groups was less than the Recommended Dietary Allowance (RDA) except cereals and millets. This can be attributed to the poor dietary intakes of micronutrients rich foods, high levels of poverty and poor purchasing capacity and ignorance about the health benefits of all the foods. The present study findings are in line with the study findings of Arlappa *et al.* (2011) [1] revealed that, the mean intakes of pulses and vegetables were below the RDA, except for intake of roots and tubers. The mean daily consumption of green leafy vegetables and other vegetables, the rich source of micronutrients was poor as compared to the suggested intakes. Similarly, the mean household intakes of pulses the "rich source" of proteins was below the RDA and none of them were meeting the suggested intake.

Table 1: Classification of food enterprises based on capital investment (n=120)

Capital Investment	Tumkur (n=60)		Bangalore Urban (n=60)		Total (n=120)	
	n	%	n	%	n	%
Small (< Rs 50,000)	41	68.3	43	71.7	84	70.0
Medium (Rs 50,000- Rs 1,000,00)	15	25.0	05	8.3	20	16.7
Large (>Rs 1,00,000)	04	6.7	12	20.0	16	13.3

Table 2: Crops grown by women entrepreneur families

District	Major crops	Commercial crops
Tumkur	Finger millet, Red gram, Paddy, Green gram, Horse gram, Cowpea, Castor, Field bean and Vegetables,	Coconut, Areca nut, Banana, Mango
Bangalore Urban	Finger millet, Green gram and Vegetables	Coconut, Areca nut

Table 3: General information of women in food enterprise (n=120)

Particulars	Tumkur (n=60)				Bangalore Urban (n=60)			
	Small (n=41)	Medium (n=15)	Large (n=04)	Total (n=60)	Small (n=43)	Medium (n=05)	Large (n=12)	Total (n=60)
Age (years)								
Young(18-35)	13(31.7)	03(20.0)	01 (25.0)	17 (28.3)	11(25.6)	01(20.0)	04(33.3)	16 (26.7)
Middle(36-50)	22(53.7)	12(80.0)	01(25.0)	35(58.3)	25(58.1)	04(80.0)	05(41.7)	34(56.7)
Old (> 50)	06(14.6)	0	02(50.0)	08(13.3)	07(16.3)	0	03(25.0)	10(16.7)
Education								
Illiterate	06 (14.6)	0	0	06(10.0)	0	0	0	0
Primary school	03 (7.3)	0	0	03(5.0)	02(4.6)	0	0	02(3.3)
Middle school	03 (7.3)	0	0	03(5.0)	01(2.3)	0	01(8.3)	02(3.3)
High school	11(26.8)	05(33.3)	01(25.0)	17 (28.3)	22(51.2)	0	0	22(36.7)
Pre-University	14(34.1)	10(66.7)	01(25.0)	25(41.7)	11(25.6)	02(40.0)	0	13(21.7)
Graduate	04 (9.8)	0	02(50.0)	06(10.0)	07(16.3)	03(60.0)	11(91.7)	21(35.0)
Family size								
Small (Up to 3 members)	12(29.3)	04(26.7)	02(50.0)	18(30.0)	11(25.6)	0	02(16.7)	13(21.7)
Medium (4-6 members)	26(63.4)	10(66.7)	01(25.0)	37(61.7)	25(58.1)	04(80.0)	08(66.7)	37(61.7)
Large (> 7 members)	03(7.3)	01(6.7)	01(25.0)	05(8.3)	07(16.3)	01(20.0)	02(16.7)	10(16.7)
Family income per month								
Low income (< Rs. 2000)	05(12.2)	0	0	05(8.3)	0	0	0	0
Medium income (Rs. 2000-3000)	16(39.0)	02(13.3)	0	18(30.0)	04(9.3)	0	02(16.7)	06(10.0)
High income (> Rs. 3000)	20(48.8)	13(86.7)	04(100.0)	37(61.7)	39(90.7)	05(100.0)	10(83.3)	54(90.0)

(Values within the parenthesis indicates percentage)

Table 4: Health problems faced and Precautionary measures taken by women entrepreneurs (n=120)

Health problems	Tumkur (n=60) @				Bangalore Urban (n=60) @			
	Small (n=41)	Medium (n=15)	Large (n=04)	Total (n=60)	Small (n=43)	Medium (n=05)	Large (n=12)	Total (n=60)
Back pain	04 (9.8)	0	02(50.0)	06(10.0)	23 (53.5)	01 (20.0)	01(1.7)	25(41.7)
Diabetes	01 (2.4)	0	0	01(1.7)	0	02 (40.0)	0	02 (3.3)
Joint pain	06 (14.6)	0	0	06 10.0)	04 (9.3)	0	0	04 (6.7)
Asthma	02 (4.9)	0	0	02 (3.3)	0	0	0	0
Blood pressure	03 (7.3)	0	02(50.0)	05(8.3)	01(2.3)	0	0	01(1.7)
Precautionary measures taken by the entrepreneurs @								
Yes	14 (87.5)	0	04(100.0)	18 (90.0)	16 (57.1)	03(100.0)	01(100.0)	20 (62.5)
No	02 (12.5)	0	0	02 (10.0)	12 (42.9)	0	0	12 (37.5)
Walking	05 (35.7)	0	01 (25.0)	06 (33.3)	04 (25.0)	03 (100.0)	0	08 (40.0)
Yoga	01 (7.1)	0	02 (50.0)	03 (16.6)	08 (50.0)	01 (33.3)	0	09 (45.0)
Exercise	06 (42.8)	0	02 (50.0)	08 (44.4)	02 (12.5)	03 (100.0)	0	06 (30.0)
Medicines	07 (50.0)	0	02 (50.0)	09 (50.0)	13 (81.3)	02 (66.7)	0	15 (75.0)

(Values within the parenthesis indicates percentage) @ - Multiple Response

Table 5: Food consumption pattern of women entrepreneurs (n=120)

Particulars	Tumkur (n=60)				Bangalore Urban (n=60)			
	Small (n=41)	Medium (n=15)	Large (n=04)	Total (n=60)	Small (n=43)	Medium (n=05)	Large (n=12)	Total (n=60)
Meal pattern								
Thrice a day	40 (97.6)	15 (100.0)	04 (100.0)	59 (98.3)	40 (93.0)	05(100.0)	12 (100)	57 (95.0)
Four times a day	01 (2.4)	0	0	01(1.7)	03 (7.0)	0	0	03 (5.0)
Food habit								
Vegetarian	34 (82.9)	10 (66.7)	03 (75.0)	47 (78.3)	22 (51.2)	02 (40.0)	09(75.0)	33 (55.5)
Non-vegetarian	07 (17.1)	05 (33.3)	01 (25.0)	13 (21.7)	21(48.8)	03 (60.0)	03 (25.0)	27 (45.0)

(Values within the parenthesis indicates percentage)

Table 6: Monthly average food consumption by entrepreneurs family (n=120)

Particulars	Tumkur (n=60)			Bangalore Urban (n=60)		
	Small (n=41)	Medium (n=15)	Large (n=04)	Small (n=43)	Medium (n=05)	Large (n=12)
Cereals(kg)	51.3	50.6	49.1	48.1	50.3	48.0
Pulses(kg)	6.5	6.8	7.2	8.4	8.9	8.9
Green leafy Vegetables(kg)	10.0	10.6	10.7	11.3	12.0	11.7
Other vegetables (kg)	20.0	21.3	21.5	22.7	24.0	23.4
Fruits(kg)	7.5	7.8	8.0	10.1	11.8	12.3
Milk and milk products(liter)	16.0	19.5	22.5	18.0	20.1	20.1
Fish and flesh foods(kg)	2.0	2.8	3.5	3.4	3.9	4.0
Fats and oils (liter)	2.4	2.8	3.1	3.1	3.6	3.7
Sugar and jaggery (kg)	3.2	3.8	3.8	3.9	4.1	4.1

Table 7: Food consumption and adequacy of diet in comparison with RDA – Tumkur (n=60)

Food Groups	RDA	Small (n=41)		Medium (n=15)		Large (n=4)	
		Mean (g)	Adequacy (%)	Mean (g)	Adequacy (%)	Mean (g)	Adequacy (%)
Cereals (g)	330	389.5	118.0	378.1	114.5	385.0	116.6
Pulses (g)	75	49.3	65.8	50.82	67.8	56.5	75.3
Green leafy Vegetables (g)	100	76.0	76.0	79.3	79.3	81.4	81.4
Other vegetables (g)	200	151.0	75.5	158.7	79.35	175.0	87.5
Fruits (g)	100	56.9	56.9	58.3	58.3	62.7	62.7
Milk and milk products (ml)	300	121.4	40.4	145.7	48.6	176.4	58.8
Fish and flesh foods (g)	60	15.18	25.31	20.93	34.9	27.4	45.8
Fats and oils (g)	25	18.2	72.9	29.92	83.7	24.3	97.2
Sugar and jaggery (g)	30	24.3	81.0	28.4	94.6	29.8	99.3

RDA- Recommended Dietary Allowance

Table 8: Food consumption and adequacy of diet in comparison with RDA – Bangalore Urban (n=60)

Food Groups	RDA	Small (n=43)		Medium (n=05)		Large (n=12)	
		Mean (g)	Adequacy (%)	Mean (g)	Adequacy (%)	Mean (g)	Adequacy (%)
Cereals (g)	330	328.5	99.5	335.3	101.6	336.8	102
Pulses (g)	75	57.3	76.5	59.3	79.1	62.5	83.3
Green leafy Vegetables (g)	100	77.4	77.4	80.0	80.0	82.0	82.0
Other vegetables (g)	200	155.0	77.5	160	80.0	164	82.0
Fruits (g)	100	68.9	68.9	78.6	78.6	86.3	86.3
Milk and milk products (ml)	300	123.0	41.0	134.0	44.7	141.0	47.0
Fish and flesh foods (g)	60	23.2	38.7	26.0	43.3	28.1	46.8
Fats and oils (g)	25	21.2	84.7	24.0	96.0	26.0	104.0
Sugar and jaggery (g)	30	26.6	88.8	27.3	91.0	28.8	96.0

RDA- Recommended Dietary Allowance

Conclusion

The average monthly household consumption and mean adequacy percentage of all the food groups was high in large size category of entrepreneurs compared to medium and small category because of higher income and increased purchasing power. Consumption of all the selected food groups showed less than recommended quantity and more than 50.0 per cent of RDA across all categories of enterprise except milk, fish and flesh foods which were further less than 50.0 per cent of RDA levels by women entrepreneurs. Hence, nutrition education should be made use to address the issues of micronutrient malnutrition by educating women entrepreneur on importance of fruits and vegetables in daily diet/ in product processed.

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