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Health status of female farm labours

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Abstract
The present investigation was designed to assess the health status of randomly selected 500 female farm labourers i.e. 250 each from urban slums and rural area of Parbhani District of Marathwada region of Maharashtra state. The study involved anthropometry, food consumption pattern, nutrient intake and haemoglobin estimation of selected 500 female farm labourers. Results revealed that the height, weight, BMI, MUAC, waist circumference, hip circumference and WHR of selected female farm labours from different socio-economic group ranged between 150.28 ± 5.80 to 151.32 ± 4.96 cm, 47.77 ± 8.63 to 51.05 ± 9.53 kg, 20.87 ± 3.42 to 22.52 ± 3.98, 24.99 ± 3.22 to 26.06 ± 3.84 cm, 72.05 ± 8.10 to 76.35 ± 10.15 cm, 86.13 ± 7.63 to 90.55 ± 9.10 cm and 0.83 ± 0.06 to 0.86 ± 0.08 respectively. It is observed that on the basis of BMI, 57.00 to 64.00 percent female farm labours were normal, 12.8 to 25.6 per cent were categorized under over weight category whereas remaining were suffering from with one or other degree of under nutrition ranged from 16 to 28 percent. Further in both the age groups (21-30yrs and 31-40yrs) mean food intake was near about same. Whereas rural and vegetarian labours shown better consumption of all foods except fats and oils and meat and meat products. When comparison was made between different income groups with respect to consumption of mean food intake, it was noted that difference was very meager. Intake of different nutrients was better in higher age group (31-40yrs), rural and vegetarian respondents. Further it was observed that there was not much difference in intake of different nutrients when compared between different income levels. The haemoglobin values of selected female labours as per different socio-economic conditions were ranging from 9.83 ± 1.48 to 10.22 ± 1.32.

Keywords: Anthropometry, Food intake, ICMR, Nutrient intake, RDA and haemoglobin

1. Introduction

Women are considered as the backbone of rural economy in Maharashtra State. Agriculture depends mostly on female labourers. Female farm labourers from agriculture area is seen working so much and so often, but their work is taken for granted. Like ambient air, they pervade all aspects of agriculture work, rarely talked or thought about the problems and issues of health and nutrition. According to WHO health is defined as state of complete mental, physical, social and spiritual well-being free from any infirmity or disease. Nutritional status is the maintenance of health with well-balanced diet and proportionate work.

Now a days health status is no longer considered an outcome solely of life style choices, It also included family, community, population, psychosocial and cultural understanding. World health organization (1995) [14] has recommended that to assess the health status of adults use anthropometry, which includes height, weight and other body measurements. The nutritional status of female labourers is integrately related to their nutritional requirement, dietary intake, dietary practices and meal pattern. Factors that tend to reduce macro and micro nutrient intake may be unequal intra-familiar distribution of food, adverse and harmful dietary practices including specific food taboos. Due to these changing dietary practices the problem of under nutrition is not mitigated to large extent.

Anaemia is one of the most common health problem among women of reproductive age in India, particularly in rural and urban deprived sections like slums. Due to different socio-economic and other influencing factors, the epidemiology of anaemia varies among different regions. Hence, there is a need to look at female labourers health and some of their social conditions to understand their status.

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2. Materials and Methods

The present investigation was designed to assess the health status of randomly selected 500 female farm labourers i.e. 250 each from urban slums and rural area of Parbhani District of Marathwada region of Maharashtra state. A combination of anthropometry, food consumption pattern, nutrient intake and haemoglobin estimation were used for assessing the health status of selected female farm labourers. Using standard procedures of anthropometry (Jelliffee, 1966 and WHO 1995) [6, 14] anthropometric measurements of height (cm), weight (kg), mid-upper arm circumference, waist – hip –ratio (WHR) of the selected 500 female farm labourers were recorded and compared with NCHS (1977) reference values. The body mass index (BMI) was calculated by using ICMR Standard formula, (1996).WHR is the ratio of circumference of the waist to that of the hip. Food and nutrient intake of all 500 female farm labourers was assessed by using 24 hours recall method for three consecutive days to determine the type and approximate quantity of food stuff consumed by each subject. Further selected samples were examined for haemoglobin content to judge the extent of prevalence of anaemia among studied area. Hemoglobin content from the collected blood sample was determined by cyanomethemoglobin method (Crossby et.al. 1954). The data was analyzed statistically by applying different suitable tests to compare between the two groups and to find out the significant difference between groups.

3. Results and Discussion

The anthropometric measurements of female farm labours from different socio-economic categories are depicted in Table 1.The height, weight, BMI, MUAC, waist circumference, hip circumference and WHR of selected female farm labours ranged between 150.28 ± 5.80 to 151.32 ± 4.96 cm, 47.77 ± 8.63 to 51.05 ± 9.53 kgs, 20.87 ± 3.42 to 22.52 ± 3.98, 24.99 ± 3.22 to 26.06 ± 3.84 cm, 72.05 ± 8.10 to 76.35 ± 10.15 cm, 86.13 ± 7.63 to 90.55 ± 9.10 cm and 0.83 ± 0.06 to 0.86 ± 0.08 respectively. It was noted from the table that highest values for height was recorded for subjects belonging to high income group, rural area and 21-30 years of age group. In case of weight, BMI and MUAC subjects belonging to 31-40 years of age group and non-vegetarian group showed highest values respectively. Higher values for waist circumference and hip circumference were noted in age group (31-40 years). These observations were in line with study conducted by Bhoyar (2006) [3] and Bellukar (2015) [4] on farm women in Parbhani district. Studies conducted by Upadhya et.al. (2011) [13] in Uttarakhand and Mittal and Shrivastava (2006) in West Bengal reflects the same results for height, weight, BMI and MUAC of farm women.

Categorisation of selected female farm labours on the basis of body mass index is presented in Table 2. It is observed from the table that 57.00 to 64.00 percent female farm labourers were normal, 12.8 to 25.6 per cent were categorized under over weight category whereas remaining 16 to 28 percent were suffering from with one or other degree of under nutrition. These findings were goes hand in hand with study conducted by Bhoyar (2006) [3] in Parbhani district and Rao *et al*. (2010) [12] in Pune district. Irrespective of criteria of categorization, it was observed from the table that respondents belonging to high income group (64%) followed by non-vegetarian group (60 to 88%), urban slum (60%) and age group of 21-30 years (59.2%) were in the category of normal. However in the category of undernourishment the respondents of 21-30 years of age (28%) followed by the respondents belonging to income

group Rs. <6000/- (27.10%) and rural area (26.8%). Further it is revealed from the table that female farmers belonging to age group 31 to 40 years showed highest per cent of overweight (25.6%) followed by urban slum (22.8%) and income group of Rs. 6000-10,000/- month. Overweight labourers were more in urban slum than rural. These findings were in line with Yadhav and Krishna (2008) [15]. Barbhuiya and Das (2013) [1] from Assam mentioned similar remarks in their study.

The mean food intake of selected female farm labours as per different socio-economic categories is depicted in Table 3. The mean food intake of cereals, pulses, green leafy vegetables, roots and tubers, other vegetables, fruits, nuts and oil seeds, milk and milk products, fats and oils, sugars and jaggary and meat and meat products was ranged between 275.38 ± 37.97 to 309.36 ± 52.28 gm, 32.08 ± 17.88 to 50.39 ± 19.36 gm, 18.37 ± 15.66 to 24.69 ± 16.36 gm, 37.76 ± 26.57 to 45.19 ± 32.90 gm, 29.92 ± 16.92 to 33.44 ± 20.02 gm, 17.62 ± 19.15 to 21.30 ± 23.39gm, 8.28 ± 4.28 to 13.09 ± 6.48 gm, 89.43 ± 23.99 to 103.19 ± 31.62 ml, 17.81± 8.33 to 21.48 ± 7.92 ml, 36.33 ± 13.67 to 43.72 ± 19.76 gm and 2.68 ±10.00 to 23.25 ± 25.16 gm respectively. When observed critically it was seen that consumption of most of the foods from both the age group were near about same. Except fats and oils and meat and meat products intake of other foods was found to be good in rural and vegetarian labours. According to Prabhat and Khyrunnisa (2012) [9] non-vegetarian food type had effect on consumption of pulses and sometimes on green leafy vegetables. Considering income of the family difference in consumption of all food groups was very meager. These finding were in line with study conducted in Parbhani district by Bhalerao and Kulkarni (2007) [2].

Mean nutrient intake of selected female farm labours as per different socio-economic categories is presented in Table 4. It was revealed from the table that the mean intake of different nutrients were that is energy (1747.52± 205.59 to 1812.39± 231.93kcal), protein (50.08 ±7.59 to 56.69 ±9.82gm), fat (32.69 ±8.60 to 35.13 ±8.17gm), calcium (418.16 ±64.04 to 475.27 ±99.25mg), iron (14.19 ±2.88 to 16.64 ±3.91mg), vit. C (36.57 ± 19.67 to 42.05 ±24.21mg), and β-carotene (1298.57 ±695.73 to 1761.60 ±1108.63μg) respectively. Further, intakes of different nutrients were better in higher age group (31-40yrs), rural and vegetarian respondents. These findings were going hand in hand with study conducted in Parbhani district by Bhoyar (2006) [3] on working status of women. There was not much difference in intake of different nutrients with reference to income of family. These findings were in line with Bhalerao and Kulkarni (2007) [2].

The mean value of haemoglobin level of selected female farm labours is recorded in Table 5. The haemoglobin values of selected female labours as per different socio-economic conditions were ranging from 9.83 ± 1.48 to 10.22 ± 1.32. These findings goes hand in hand with studies conducted in Pune district of Maharashtra by Patavegar et.al. (2014) [8] and Rao (2014) [11]. The observed values were below the normal values when compared with standards. Among the group, the least haemoglobin values were recorded for primary educated group (9.83 ± 1.48) followed by urban slum (9.90 ± 1.39) and 21 to 30 years (9.97 ± 1.33) age group female farm labours. Whereas the highest values was observed for rural areas (10.22 ± 1.39) followed by high income group i.e. > Rs. 1000/- (10.22 ± 1.32). Statistically significant difference was observed in urban slum and rural areas only. Age and food habit exhibited non-significant difference with respect to haemoglobin value.

Table 1: Anthropometric measurements of selected female farm labours (N=500)

Particular	Height (cm)	Weight (kg)	BMI	MUAC (cm)	Waist Circumference (cm)	Hip Circumference (cm)	Waist – Hip Ratio (WHR)
Age Group (yrs)							
21-30 (N=250)	151.22 + 5.82	47.77 + 8.63	20.87 + 3.42	24.99 +3.22	72.05 + 8.10	86.13 +7.96	0.83 + 0.06
31-40 (N=250)	150.46 + 5.11	51.05 + 9.53	22.52 + 3.98	26.06 + 3.84	76.35 + 10.15	90.55 + 9.10	0.84 + 0.09
Area							
Rural (N=250)	151.30 + 5.68	48.98 + 9.32	21.34 + 3.74	25.20 + 3.20	73.85 + 9.42	87.86 + 8.82	0.84 + 0.05
Urban Slum (N=250)	150.38 + 5.26	49.902 + 9.12	22.04 + 3.83	25.85 + 3.91	74.55 + 9.42	88.82 + 8.82	0.86 + 0.06
Food Habit							
Vegetarian(N=275)	151.025 + 5.35	48.84 + 9.17	21.38 + 3.68	25.12 + 2.70	73.85 + 9.20	87.49 + 8.54	0.84 + 0.04
Non-vegetarian (N=225)	150.62 + 5.66	50.11 + 9.26	22.08 + 3.91	26.01 + 4.39	74.96 + 9.64	89.38 + 9.07	0.86 + 0.06
Family Income (Rs. per month)							
Up to 6000 (N=107)	150.28 + 5.80	48.25 + 9.27	21.35 + 3.81	25.08 + 2.74	73.63 + 9.06	87.44 + 8.95	0.84 + 0.05
6001 to 10000 (N=293)	150.88 + 5.54	49.94 + 9.54	21.91 + 3.94	25.69 + 3.70	74.64 + 9.95	88.87 + 9.16	0.86 + 0.04
>10001 (N=100)	151.32 + 4.96	49.09 + 8.13	21.42 + 3.32	25.50 + 3.99	73.52 + 8.12	87.75 + 7.55	0.86 + 0.08

Table 2: Categorization of selected female farm labourers on the basis of BMI (N=500)

Particular	Undernourished (<18.5)	Normal (18.5 – 25)	Overweight (>25.0)
Age group (yrs)			
21-30	70 (28)	148 (59.2)	32 (12.8)
31-40	40 (16)	146 (58.4)	64 (25.6)
Area			
Rural	67 (26.8)	144 (57.6)	39 (15.6)
Urban slum	43 (17.2)	150 (60.00)	57 (22.8)
Food Habit			
Vegetarian	65 (23.63)	157 (57.9)	53 (19.27)
Non vegetarian	45 (20.00)	137 (60.88)	43 (19.11)
Income level (Rs. Per month)			
Upto 6000	29 (27.10)	61 (57.00)	17 (15.88)
6001-10000	61 (20.81)	169 (57.67)	63 (21.5)
> 10000	20 (20.00)	64 (64.00)	16 (16.00)

Figure in parenthesis indicates percentage

Table 3: Mean food intake of selected female farm labours (N=500)

Particular	Cereals (gm)	Pulses (gm)	Green Leafy vegetables (gm)	Roots & Tubers (gm)	Other Vegetables (gm)	Fruits (gm)	Nuts and Oil seeds	Milk and milk products (ml)	Fats & Oils (ml)	Sugars & Jaggery (gm)	Meat and Fish (gm)
Balanced Diet	360	75	100	100	100	100	-	300	30	25	30
Age Group (yrs)											
21-30 (N=250)	288.86 + 49.37	40.77+20.39	22.96+16.20	41.66+38.72	32.06+19.24	17.70+19.66	10.95+6.73	95.78+29.20	20.16+9.69	39.29+16.58	13.97+21.96
31-40 (N=250)	295.88+50.50	42.31+20.35	22.12+16.48	42.54+30.13	30.94+18.11	21.08+22.01	10.42 +5.26	98.22+28.98	19.13+6.99	41.50+18.18	11.96+21.47
Area											
Urban Slum (N=250)	275.38+37.97	32.69+17.35	18.39+14.26	39.01+35.42	30.50+17.24	18.81+18.88	8.28+4.24	91.17+19.72	21.48+7.92	38.11+13.10	23.25+25.16
Rural (N=250)	309.36+52.28	50.39+19.36	26.69+17.23	45.19+32.90	32.51+19.89	19.98+22.90	13.09+6.48	102.83+35.21	17.81+8.33	42.68+20.82	2.68+10.00
Food Habit											
Vegetarian (N=275)	301.90+53.44	49.28+19.06	24.69+16.36	45.65+39.44	32.81+19.88	21.30+23.39	12.00+6.41	103.19+1.62	19.02+7.50	43.72+19.76	-
Non-vegetarian (N=225)	280.72+43.78	32.08+17.88	19.91+15.91	37.76+26.57	29.91+16.92	17.06+17.53	9.09+5.03	89.43+23.99	20.41+9.25	36.33+13.58	-
Family Income (Rs. per month)											
< 6000 (N=107)	290.78+55.48	41.33+11.70	24.60+17.82	41.18+17.79	30.83+18.42	17.62+19.15	10.20+5.74	94.67+30.21	19.01+2.89	40.79+8.38	14.25+22.30
6001 to 10000 (N=293)	298.59+48.71	42.04+12.82	23.05+15.85	38.98+20.57	33.44+20.02	19.96+21.40	10.76+6.23	97.64+31.55	20.40+3.96	39.05+8.47	12.88+21.75
>10001 (N=100)	290.38+47.65	40.31+10.24	18.37+15.66	43.57+35.37	31.55+17.85	19.64+21.65	11.02+5.44	97.93+32.86	18.19+2.59	40.61+8.56	11.97+21.14

Table 4: Mean nutrient intake of selected female farm labours (N=500)

Particular	Energy (kcal)	Protein (gm)	Fat (gm)	Calcium (mg)	Iron (mg)	Vit.C (mg)	β – Carotene (µg)
RDA	2230	55	25	600	21	40	4800
Age Group (yrs)							
21-30 (N=250)	1762.38 ± 262.74	52.90 ±8.57	34.43 ±8.85	445.19 ±86.00	15.37 ±3.52	37.63 ± 19.81	1570.31 ±920.60
31-40 (N=250)	1791.47 ±258.87	53.77 ±9.92	33.67 ±8.38	448.24 ±90.34	15.47 ±3.74	42.05 ± 24.21	1489.86 ±980.09
Area							
Urban Slum (N=250)	1743.75 ±192.02	50.08 ±7.59	35.13 ±8.17	418.16 ±64.04	14.19 ± 2.88	39.06 ±24.68	1298.57 ±695.73
Rural (N=250)	1810.11 ± 313.35	56.59 ± 9.82	32.96 ± 8.88	475.27 ± 99.55	16.64 ± 3.91	40.62 ± 19.82	1761.60 ± 1108.63
Food Habit							
Vegetarian(N=275)	1812.39 ±280.89	54.64 ±9.88	33.25 ±8.08	462.60 ±93.83	16.15 ±3.85	41.60 ± 23.04	1629.19 ± 968.00
Non-vegetarian (N=225)	1733.59 ±231.93	51.74 ±8.48	35.03 ±9.15	427.30 ±77.63	14.52 ±3.16	37.69 ± 21.49	1408.96 ± 923.05
Family Income (Rs. per month)							
Up to 6000 (N=107)	1791.69 ±230.77	53.34±9.82	34.67±8.38	449.61±42.53	15.44±2.34	41.34±18.76	1647.56±990.19
6001 to 10000 (N=293)	1764.02±216.71	54.19±8.40	33.72±8.79	449.31±48.60	15.57±2.93	36.57±19.67	1551.07±940.60
>10001 (N=100)	1747.52±205.59	51.34±8.90	32.69±8.60	435.51±67.60	14.96±3.16	38.98±19.90	1342.92±920.30

Table 5: Haemoglobin level in the bloodsample of selected female farm labours from different socio-economic status (N=500)

Sr. No.	Particular	Haemoglobin content	't' value
	Area		
1.	Urban	9.90 ± 1.39	2.61**
2.	Rural	10.22 ± 1.32	
	Age Group (yrs)		
3.	21-30	9.97 ± 1.33	1.39[NS]
4.	31-40	10.14 ± 1.39	
	Food Habit		
5.	Vegetarian	10.16 ± 1.31	1.73 [NS]
6.	Non-vegetarian	9.94 ± 1.43	
	Family Income (Rs. per month)		
7.	Up to 6000	10.00 ± 1.35	0.45 [NS]
8.	6001-10000	10.07 ± 1.24	0.64 [NS]
9.	>10001	10.20 ± 1.52	1.14 [NS]
	Educational Levels of Subjects		
10.	Primary Educated	9.83 ± 1.48	1.80 [NS]
11.	Secondary Educated	10.12 ± 1.25	0.15 [NS]
12.	High School Educated	10.15 ± 1.38	1.91 [NS]

4. Conclusion
Difference in anthropometric measurements was very meager when compared between areas. Anthropometric measurements like BMI, MUAC and waist-hip-ratio were in line with standard NCHS values whereas height and weight were 7 to 8 percent and 8 to 15 percent deficient than NCHS standards respectively. About 60 per cent respondents were categorized as normal on the basis of BMI. Mean food intake was inadequate as compare to ICMR recommendations except sugar and jaggery. Nutrient intake was below when compare with RDA for energy, calcium, iron and β-carotene whereas equal to or more for protein, fat and Vit. C. Haemoglobin level of all selected subjects were less than 11mg per cent which was below normal.

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