# Nutritional status assessment among women sweepers in midnapore municipality of West Bengal, India

Silpishree Pradhan<sup>1</sup>, Sabita Mondal<sup>1</sup>, Rimpa Das<sup>1</sup>, Kazi Monjur Ali<sup>1</sup>, Soumyajit Maiti<sup>1</sup>, Debidas Ghosh<sup>1</sup>\*

<sup>1</sup>Department of Bio-Medical Laboratory Science and Management, Vidyasagar University, Midnapore-721 102, West Bengal, India.

## Abstract

Objective: The present study aimed to evaluate the nutritional status among women sweepers in Midnapore Municipality of West Bengal.

Methods: A cross-sectional study was carried out on 56 women sweepers (age group of 25 to 60 years) working in Midnapore Municipality of West Bengal, India. Nutritional status of women sweepers were assessed using anthropometric indices like height, weight, body mass index (BMI) and analysis of their daily diet.

Results: Result showed that 55.35% and 41.07% of women sweepers were suffering from underweight and undernutrition respectively. The age group of 41-50 years and 51-60 years of the women sweepers are suffering from energy deficiency than other two age groups. Study also revealed that 55.35% of women sweepers were suffer in protein deficiency and more than 60% of subjects were suffering from both the calcium and iron deficiencies. Out of the total participants about 19.64%, 67.85%, 16.07%, 55.35% and 37.5% are suffering from vitamin - A, B complex, C, D and E deficiencies respectively.

Conclusion: Most of the women sweepers of the study area are suffering from undernutrition.

Key Words: Nutritional status, Women sweepers, Dietary analysis, Midnapore

## **INTRODUCTION**

Nutritional status has been defined as an individual's health condition as it is influenced by the intake and utilization of nutrients. Our country has been facing different nutrition problems since the early decades of the last century. Narasinga Rao reported that nearly 50% of Indian populations who are poor face the nutrition deficiency problems covering energy, protein, calcium, iron, vitamin-A, C, D, E and B complex generally.<sup>[1]</sup> Dietary intake of these nutrients is generally inadequate to meet their requirements leading to clinical or functional deficiencies of nutrients.

However, after 1960s community diet and nutrition surveys were carried out systematically, particularly among the women who were also come from low income level. It is generally believed that the nutritional status of a person is a function of her socio-economic condition. It has become apparent that improvement in the health and nutritional status of people can be brought about only through a successful management on the basic problems of poverty and injustice.

Amita and Nina reported that women sweeper is traditionally and economically segmented of the working population that suffer from many disadvantages.<sup>[2]</sup> This disadvantages group was suffered with anemia mainly due to iron deficiency, vitamin-A deficiency with impaired ocular function, impaired growth function, skin dysfunction due to riboflavin and the other B-vitamins. Powers et al. reported that iron deficiency anemia with high prevalence among women is found that impaired the work capacity.<sup>[3]</sup>

Address for correspondence*
Debidas Ghosh
Department of Bio-Medical Laboratory Science and
Management, Vidyasagar University, West Bengal, India
Email :debidas ghosh@vahoo.co.in

The present study was design to evaluate the nutritional status among women sweepers in Midnapore Municipality.

#### **MATERIALS AND METHODS**

#### Study area and participants

The present study was conducted among the women sweepers who were working under the Midnapore Municipality of West Bengal, India. Midnapore is the districts headquarter, situated about 129 K.M from the provincial capital. Total 56 women sweepers were selected randomly with age group of 25 to 60 years. The participants were included in the study on the basis who was engaged in their work at least 5 years. All the necessary data were collected from door to door survey work.

#### Nutritional assessment

#### Anthropometric measurements

Nutritional status assessment of the women sweepers were assessed through anthropometric measurements i.e. height, weight. Age wise nutritional status of the women sweepers were evaluated using weight-for-height indices. For this purpose we follow the Prasanthi et al. classification where this value was 80-110%, it was considered as normal. In contrast, when such values were within the range of 60-80%, it was considered as underweight. Similarly, when these values were in the range of 110-120%, these were in the group of overweight.<sup>[4]</sup>

Along with for the evaluation of nutritional status of our target groups, we have monitored body mass index (BMI). The BMI was computed following the standard formula:  $BMI (kg/m^2)$ = Weight (kg) / Height ( $m^2$ ). It was assessed as per the age and sex specific Asian reference value as reported in 2004 by World Health Organization (WHO). When the BMI values within the range of 18.5-25 Kg/m<sup>2</sup>, it was considered under normal nutrition. On the other hand, when the values below than  $18.5 \text{ Kg/m}^2$  or

above 25 Kg/m<sup>2</sup>, these are reported as under nutrition and over nutrition respectively.<sup>[5]</sup>

### **Dietary analysis**

Amount of daily energy, protein, calcium, iron and different types of vitamin intake were analyzed in the study. We have assessed the energy (Kcal) consumption status of women sweepers in different age group as per standard protocol. Swaminathan reported that at the age group of 25-30 years the normal daily requirement of energy is 2100-2200 Kcal, for the age group of 31-40 years, the value is 2000-2100 Kcal, for the age group of 41-50 years, the requirement is 1900-2000 Kcal and for the age group 51-60 years, this value is 1800-1900 Kcal.<sup>[6]</sup> For the evaluation of protein requirement of the women sweepers according to their body weight, we follow the daily allowances of protein, recommended by Indian Council of Medical Research (ICMR) which is 1.0 gm. protein per Kg. body weight for an Indian adult.<sup>[7]</sup>

We follow the ICMR reference value of  $1990^{[7]}$ , for the determination of daily calcium requirement of the targeted female groups and this value is 400 mg./day. For the assessment of daily iron requirement, we follow the recommended dietary allowances of National Research Council in 1989 and the normal value is 15 mg./day.<sup>[8]</sup> For the evaluation of daily vitamin – A, vitamin-B complex, vitamin-D and vitamin-E requirement of the selected subjects, we follow the recommended dietary allowances of the Food and Nutrition Board.<sup>[9]</sup> It is reported that normal value of vitamin – A is 700 µg./day, vitamin- B complex is 2.4 µg./day, vitamin- D is 8 µg./day and vitamin- E is 15 mg./day. For the assessment of daily vitamin-C status of the targeted women sweepers, we follow the ICMR chart and it is reported that normal daily requirement is 40mg./day.<sup>[10]</sup>

#### **Ethical Consideration**

Institutional ethical permission was obtained before commencement of the study. Verbal consent of each participant was also obtained prior to the conduction of the study by focusing the nature and purpose of the said work.

#### **RESULTS AND DISCUSSION**

Table 1 shows the nutritional status of women sweepers according to weight-for-height percent.

Different nutritional status of selected women subjects according to Body Mass Index (BMI) is shown in Table 2.

From the analysis of anthropometric variables and nutrients intake, it has been indicated that 55.35% of women sweepers are suffering from underweight and 41.07% are suffering from under nutrition. This observation is consistent with the report of others, where high prevalence rate of under nutrition is noted in low socio economic group of women.<sup>[11]</sup> To find out the possible causative factors for such high rate of under nutrition, the dietary analysis was performed. Table 3 shows the daily energy requirement of the women sweepers according to their respective age groups. It has been noted that sweepers in the age group of 41-50 years and 51-60 years are suffering from energy deficiency than other two age groups. This may be due to negligence of the aged sweepers to their own food consumption in respect to others age groups. As energy and protein intake both are causative factors for under nutrition, we have also noted the protein intake level in respect to Indian reference value. It has been noted that 55.35% of the women sweeper are suffering from protein deficiency. This may be due to their low economic level as

in all the families, we have noted that only the concerned female is engaged in their job and male adult members are not engaged in any type of permanent job.

Darnton et al.<sup>[12]</sup> and Jaiswal,<sup>[13]</sup> reported that minerals and vitamins are also another influencing factors for interference of growth and metabolism. So, for this purpose we have computed the amount of iron and calcium consumption which are important regulators.

The daily protein, calcium and iron requirement of the participants was shown in Table 4.

Table 1: Determinants of nutritional status (weight-
for-height) among the women sweepers (n=56)

Category of Nutritional Status

Underweight		Normal		Overweight					
(60-80Kg)		(80-110K	(g)	(110-120Kg)					
Number	%	Number	%	Number	%				
31	55.35	20	35.71	5	8.92				

Table 2: Prevalence of undernutrition (according to BMI value) among the women sweepers (n = 56)

Category									
Under Nutr	rition	Normal Nu	itrition	Over Nutrition					
(Below 18.5 kg/m <sup>2</sup> )		(18.5-25 k	$g/m^2$ )	(Above 25 kg/m <sup>2</sup> )					
Number	%	Number	%	Number	%				
23	41.07	21	37.5	12	21.42				

Table 3: Age groups	wise energy	intake among the
women sweepers		

	Category							
Age group (years)	Energy Deficiency		Normal Energy		Excess Energy			
	Number	%	Number	%	Number	%		
25-30(n=9)	3	33.33	5	55.55	1	11.11		
31-40(n=24)	8	33.33	12	50	4	16.66		
41-50(n=15)	9	60	4	26.66	2	13.33		
51-60(n=8)	4	50	3	37.5	1	12.5		

Table 4: Distribution of women sweepers on the basis ofProtein, Calcium and Iron

	Category							
Dietary Groups	Deficiency		Normal		Excess			
	Number	%	Number	%	Number	%		
Protein	31	55.35	19	33.92	6	10.71		
Calcium	36	64.28	16	28.57	4	7.14		
Iron	37	66.07	12	21.42	7	12.5		

Name of vitamin	Category							
	Deficiency of Vitamin		Normal Vitamin		Excess Vitamin			
	Number	%	Number	%	Number	%		
Vitamin-A	11	19.64	40	71.42	5	8.92		
Vitamin-B complex	38	67.85	14	25	4	7.14		
Vitamin-C	9	16.07	35	62.5	12	21.42		
Vitamin-D	31	55.35	21	37.5	4	7.14		
Vitamin-E	21	37.5	32	57.14	3	5.35		

Table 5: Distribution of women sweepers on different categories according to their different Vitamin intake (n = 56)

Table 5 shows the daily requirement of the Vitamin-A, B complex, C, D and E of the women sweepers. It has been noted that both calcium and iron deficiencies are noted at the level of more than 60% in each case. As female sweepers are not only engaged for their professional job work but also are engaged in food preparation and other daily work in their houses. So, there is a high probability of oxidative injury due to deficiency of such vitamins. Vince et al.<sup>[14]</sup> and Berg et al<sup>[15]</sup> reported that vitamin A, C and E are potent antioxidants. So, we have also measured the status of vitamin A, C and E consumption in respect to requirement. It has been indicated that 19.64%, 16.07% and 37.5% women sweepers are also suffering from deficiency of these vitamins respectively. It is well established that nutritional anemia is another factor for underweight or under nutrition. Dietary vitamin B complex, iron, vitamin-C all are involved for the onset of nutritional anemia. From our observation it has been indicated that such deficiencies of nutritional factors are also noted. Moreover, vitamin-D deficiency which is responsible for bone activity is also noted here. From this observation it may be noted that women sweepers of our study area suffering from underweight and undernutrition due to nutritional deficiency. For their health up gradation supporting service like low cost ration may be implemented for them. A broad intersectoral and integrated approach is needed to tackle the nutritional problems of this group of our society.

### CONCLUSION

In conclusion, the present investigation has documented high level of under nutrition amongst women sweepers working in Midnapore Municipality of West Bengal. Our results also suggest that inadequate nutrition intake has been a major contributory factor for poor nutritional status of study participants. The results of the present study will be useful for policy makers in their endeavour to formulate various developmental and health care programmes. We recommended that nutritional intervention is also necessary to ameliorate the nutritional status among the studied groups.

### ACKNOWLEDGEMENTS

We are Thankful to Department of Science and Technology (DST), Govt. of India, for financial assistance under a project entitled "Formulation and implementation of awareness package against occupational health hazards of working women at rural based small scale industries of Medinipur, West Bengal " having Ref. No.CO/FP/G136/07. We also grateful to authority of

Midnapore Municipality and the participants of our study.

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