

## DIETARY DIVERSITY AMONG WOMEN IN THE REPRODUCTIVE AGE GROUP IN URBAN FIELD PRACTICE AREA, VIMSAR, BURLA

Dr. Smita Kumari Panda<sup>1</sup>, Dr. Kulwant Lakra<sup>2</sup>, Dr. Sadhu Charan Panda<sup>3</sup>

<sup>1</sup>Associate Professor, Department of Community Medicine, VIMSAR, Burla

<sup>2</sup>Assistant Professor, Department of Community Medicine, VIMSAR, Burla

<sup>3</sup>Professor and Head, Department of Community Medicine, VIMSAR, Burla

**Article Info:** Received 14 April 2019; Accepted 02 June. 2019

**DOI:** <https://doi.org/10.32553/ijmbs.v3i6.283>

**Corresponding Author:** Dr. Kulwant Lakra, Assistant Professor, Department of Community Medicine, VIMSAR, Burla

**Conflict of interest:** No conflict of interest.

### Abstract

One of the problems among Women of Reproductive Age (WRA) group has been lack of effective programs whose benefits are not reaching WRA group. Another problem is the prevalence of monotonous diet based on starchy staple food, which lacks essential micronutrients and contribute to the burden of malnutrition and micronutrient deficiency. The objectives of the study was to assess household dietary diversity and nutritional status of non-pregnant non-lactating women of reproductive age in urban field practice area in Burla as a way of comparing food security situation. It was a cross sectional study. Data were collected from urban field practice area in Burla and were analysed to assess the dietary diversity among “women of reproductive age (WRA)” group. One third (about 29%) of them was malnourished. On application of logistic regression, those aged  $\geq 25$  years had better odds of having Minimum Dietary Diversity (MDD) score of 5 and above (OR=1.777). Subjects with BMI range  $\geq 21.5$  Kg/m<sup>2</sup> also had better odds of having MDD score of 5 and above (OR=3.371). Women of reproductive age are nutritionally more vulnerable because of pregnancy, lactation and menstruation requiring nutrient dense quality food. Monotonous diet based on starchy staple lacks essential micronutrients and contribute to the burden of malnutrition and micronutrient deficiency. Intake of diverse diet is a cost effective strategy to overcome this problem. From our survey we conclude that more than half of WRA failed to achieve MDD. Based on findings, Information Education and Communication (IEC) activities are recommended with an emphasis on locally available, low-cost nutrition diet.

**Keywords:** Minimum Dietary Diversity, Women of Reproductive Age, Micronutrients

### Introduction:

Women of reproductive age group (WRA) includes women from age group 15-49 years. They are nutritionally vulnerable owing to the physiological demands of pregnancy as well as lactation. They are nutritionally more vulnerable because of pregnancy, lactation and menstruation.<sup>[1]</sup> These vulnerabilities and gaps in diet quality for WRA are more frequent in low- and middle-income countries. Promotion of diverse diet is one of the many approaches to improve micronutrient nutrition for WRA.<sup>[2]</sup> In developing countries like India, diet quality of WRA is very poor and their food intake is also poor. This leads to a gap between their intake and requirements hampering their nutrition and affecting their health.

Also this may lead to deficiency of important micronutrients which will have an impact on their health. Thus it is essential to improve nutritional status of WRA.

Although the paradigm shift from food security to nutrition security has been adopted in India through dietary diversification, micronutrient adequacy is not ensured in Indian diet, especially among women residing in slums. Dual curse of poverty and gender bias, coupled with incomplete knowledge about the diet quality are major obstacles in ensuring Minimum Dietary Diversity among women (MDD-W) in this area.<sup>[2]</sup> Therefore, to improve the nutritional status of WRA group, we must first have an understanding of the current nutritional status of the WRA group. For

this purpose, simple indicators to reflect on aspects of food intake and/or diet quality are devised. One such indicator is Minimum Dietary Diversity for Women (MDD-W).

MDD-W is a dichotomous indicator of whether or not women 15-49 years of age have consumed at least five out of ten defined food groups the previous day or night. The proportion of women 15-49 years of age who reach this minimum dietary diversity in a population can be used as a proxy indicator for better micronutrient adequacy, one important dimension of diet quality. The ten food groups are (1) Starchy staple: Cereals (rice, wheat), roots, tubers and plantains, (2) pulses and legumes (lentils, beans, peas), (3) oilseeds and nuts, (4) milk product, (5) fish, meat, poultry, (6) egg, (7) fruits and vegetables rich in vitamin A ( $\beta$ -carotene), (8) green leafy vegetables, (9) other fruits, (10) other vegetables. Other categories not included in MDD-W : Insects and other small protein foods, Red palm oil, Other oil and fats, Savoury and fried snacks, Sweets, Sugar-sweetened beverages, Condiments and seasonings, Other beverages and foods.

The indicator is calculated based on a single day, and because it is calculated without information on quantities consumed, the indicator does not provide information about diet quality for individual women. Even for groups of women, meeting the threshold of five or more food groups does not guarantee that micronutrient needs are met, though it increases the likelihood that they are being met. Whether or not intakes are adequate depends on quantities of nutrient-dense foods consumed, as well as on dietary diversity<sup>[3]</sup>

It is appropriate to measure Minimum Dietary Diversity for Women of Reproductive Age (MDD-W) when a simple proxy indicator is needed to describe one important dimension of women's diet quality – micronutrient adequacy – in national and subnational assessments. It is appropriate use MDD-W to compare with previous assessments so long as survey timing accounts for seasonality, as seasonal differences can affect the relationship between food group diversity and micronutrient adequacy.<sup>[2]</sup>

The study is being conducted in urban field practice area of VIMSAR, Burla. We don't have adequate knowledge regarding dietary diversity of the women in this area as studies regarding this have not been conducted in this area earlier. Also there is lack of awareness regarding dietary diversity among the

people of this area. Thus the present study was conducted to assess household dietary diversity of non-pregnant non-lactating (NPNL) women of reproductive age in urban field practice area in Burla and to identify the educational qualifications of the women in the study and its relationship to dietary diversity.

#### **MATERIAL AND METHODS:**

**Study design:** Cross sectional study

**Place of study:** The study was conducted in the Urban field practice area, VIMSAR, Burla.

**Period of study:** The study duration was a period of 3 months from Jan 2019 to March 2019.

**Study subjects:** Women of reproductive age (WRA) group from 15-49 years of age were surveyed. Those who did not give consent and pregnant and lactating women were excluded from the present study.

**Sampling method:** There are 25 Anganwadi centres at Burla; out of which 5 Anganwadi centres (AWC) were selected by simple random sampling method. The total enrolled WRA in this 5 AWCs were 300. Only 150 non-pregnant non-lactating women of reproductive age group (WRA) were available during study periods and others could not be added due to non availability, non willing to participate, pregnancy and lactation.

**Study procedure:** Data were collected by 24hour recall method. For each individual in the study households, the following information was collected in the 24hr recall: meals, name of foods/mixed dishes the individual had consumed. Recipe data for mixed dishes were collected from the female household member who was responsible for cooking (or supervising cooking) and serving food.<sup>[5]</sup> A 1-day recall is sufficient to capture diversity for groups of women. For any individual, it is normal for the diet to vary from day to day, so one day diversity may be very low, while it is very high the next day. As the respondent recalled foods and drink, the corresponding items were written down in the columns made for them and score '1' in the response column for that row on the questionnaire was given for the category of food that were consumed. The questionnaire used was based on the Gina Kennedy, Terri Ballard, MarieClaudeDop. Nutrition and Consumer Protection Division, Food and Agriculture Organization of the United Nations : Guidelines for Measuring Household and Individual Dietary

Diversity<sup>[5]</sup> and the scoring system adapted was from FAO and FHI 360 Minimum Dietary Diversity for Women: A Guide for Measurement. Rome: FAO; 2016.<sup>[6]</sup>

**Food items with multiple ingredients:** Certain food items with multiple ingredients are classified into a single food row on the questionnaire, based on the major ingredient and on the role of the item in the diet.<sup>[7]</sup>

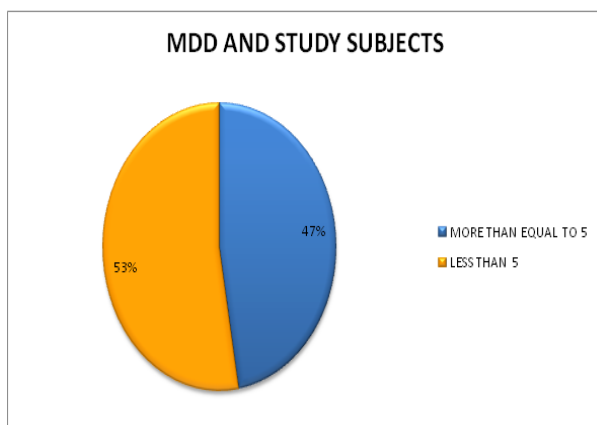
**RESULTS**

The study was conducted among 150 women of reproductive age group in an urban setting in Burla. The age ranged from 15-49 years. The questionnaire included questions to know about their BMI, income status, education, occupation, marital status and finally their dietary survey which included the 24 hour recall method. Then their Dietary diversity score was obtained.

**TABLE 1: MDD and Age of study subjects (N=150)**

Age groups (in years)	Frequency	Percentage
15-25	52	38.4
25-35	66	54.5
35-45	28	50.0
45-Onwards	4	25.0

Table no 1 depicts that the age group distribution is studied and the proportion of WRA attaining MDD among them was found out. It was found that 66 (54.5%) women of the age group 25-35 years, 35-45 years were 28 (50%) women. The Minimum Dietary Diversity (MDD) 50% of the age group 35-45 years attained MDD ≥ 5 as shown in Figure no 1.



**FIGURE 1: MDD and Study subjects**

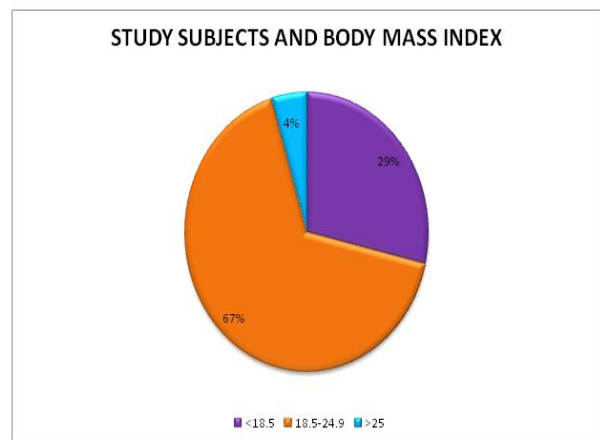
**TABLE 2: Study subjects and the food groups consumed (N=150)**

Food groups	Frequency	Percentage
1.Grains, White Roots and Tubers and Plantains	150	100
2.Pulse (Beans, Peas and Lentils)	127	84.66
3.Nuts and seeds	13	8.66
4.Dairy	104	69.33
5.Meat, Poultry, Fish	44	29.33
6.Egg	21	14.00
7.Dark green leafy vegetables	67	44.66
8.Other vitamin A rich fruits and vegetables	56	37.33
9.Other vegetables	107	71.33
10.Other fruits	36	24.00

Table no.2 represents that among 150 women, 71 women consumed five or more of the 10 specified food groups the previous day. Therefore, “Proportion of WRA” attaining MDD was 47.30%.

If the 10 food groups were considered, then 100% of study subjects consumed cereals. Least number of people consumed food of nuts and seeds group. The food groups consumed by more than 50% people includes:

- a) Grains, Tubers
- b) Pulses
- c) Dairy products
- d) Vegetables other than green leafy vegetables



**FIGURE 2: Body Mass Index and Study subjects.**

If BMI was considered, majority had normal BMI i.e., about 67%. Among the rests 4% were overweight and 29% were underweight as depicted by Figure no. 2

**TABLE 3: Per capita income of study subjects (N=150)**

Per capita income (per month)	Frequency	Percentage
<5000	57	38.0
5000-10000	88	58.7
>10000	5	3.3

Table 3 depicts that if the per capita income was considered, then about 88 (58.7%) people had their per capita income in the range 5000-10000. From the remaining 62, 57 (38%) people had their per capita income below 5000 and 5(3.3%) had per capita income above 10000.

**TABLE 4: Socio demographic variables (N=150)**

Education	Frequency	Percentage
Illiterate	25	16.67
Completed primary education	63	42.00
Completed secondary education	62	41.33
Marital status	Frequency	Percentage
Unmarried	37	24.67
Married	113	75.33
Occupation	Frequency	Percentage
Housewife	92	61.33
Student	25	16.67
Working	33	22.00

Table 4 shows that if the educational background is considered, then about 63 (42%) have completed primary education, 62 (41.3%) have completed secondary education and rests were illiterate. If the marital status is taken into account then majority of them were married having children. In the survey, 113 women (75.3%) were married and 37 (24.67%) were unmarried. If the occupation was considered, majority of them were housewives, i.e. about 61.33% were housewives. Remaining were either working or were students. It has been seen that those who are working and are having better per capita income have better dietary diversity score.

**TABLE 5: Minimum Dietary Diversity Score (N=150)**

Minimum dietary score	Dietary	Frequency	Percentage
2		6	4.00
3		27	18.00
4		46	30.66
5		38	25.33
6		27	18.00
7		5	3.33
8		1	0.66

Among the score obtained, it is observed that 52.66% are having MDD less than 5 and 47.32% have MDD ≥5 among which 25.30% are having MDD=5, 18% have MDD=6 and very few i.e. about 3.99% have dietary diversity score 7 and 8.

**TABLE 6: Univariate logistic regression between MDD-W and different predictor variables.**

Variables	Frequency (%)	MDD-W(%)	OR (95% CI)
<b>Age in years</b>			
<25	52 (34.6)	20 (28.2)	1
			1.777 (0.777-4.066)
≥25	98 (65.3)	51 (71.8)	
<b>Education</b>			
Illiterate	25 (16.7)	10 (14.1)	1
			1.577 (0.444-5.604)
Educated	125 (83.3)	61 (85.9)	
<b>Marital Status</b>			
Married	113 (75.3)	55 (77.5)	1
			0.971 (0.339-2.781)
Unmarried	37 (24.7)	16 (22.5)	
<b>Monthly Per capita Income</b>			
<5000	57 (38.0)	15 (21.1)	1
			3.014 (1.311-6.932)
≥5000	93 (62.0)	56 (78.9)	
<b>BMI</b>			
≤21.5	83 (55.3)	33 (46.5)	1
			3.371 (1.439-7.897)
>21.5	67 (44.7)	38 (53.5)	

From the above table it has been observed that

- Those with age ≥ 25 years had 1.777 times higher odds of attaining MDD as compared to those with <25 years.
- BMI has significant statistical association with MDD. Proportion of WRA who have BMI >21.5 had 3.371 times higher odds of attaining MDD as compared to those who have BMI ≤21.5.
- In relation with education, those who are educated had 1.577 times higher odds of attaining MDD as compared to those who are illiterate.
- As per marital status is concerned, those who are unmarried have 0.097 times higher odds of attaining MDD as compared to those who are married.
- In our study, significant statistical association was also found between MDD and per-capita income. Proportion of WRA with monthly per capita income ≥ 5000 have 3.014 times higher odds of attaining MDD as compared to those with per capita income < 5000 per month.

## DISCUSSION:

In our study, "Proportion of WRA" attaining MDD was found to be 47.3% only. This is consistent with the findings of study by Manika Pal et al.<sup>[2]</sup> where they have shown it to be 46.2%. Our study shows maximum participants were in the age group 25-35 years and 54.33% of them had MDD  $\geq 5$ . Those with age  $\geq 25$  years had 1.777 times higher odds of attaining MDD as compared to those with  $<25$  years. This finding is consistent with the study by Shashikanta et al.<sup>[4]</sup> in which those aged between 15-30 years had higher odds of having dietary diversity score of  $\geq 5$  (aOR 2.348 CI 0.743-7.424). Our study concluded that nearly 67% of the participants had normal BMI, 4% were overweight and 29% were underweight. Proportions of WRA reaching MDD  $\geq 5$  among those with normal BMI is 49.12%, among those who are overweight is 42.85% and among underweight is 8.03%. A significant statistical association was found in our study between dietary diversity and BMI which is an indicator of nutritional status. Proportion of WRA who have BMI  $>21.5$  had 3.371 times higher odds of attaining MDD as compared to those who have BMI  $\leq 21.5$ . As compared to the findings of study by Shashikant et al.<sup>[4]</sup> where normal range of BMI was found to be 48% among WRA, we have a greater proportion of WRA in normal BMI range but that did not ensure their micronutrient adequacy. In our study, significant statistical association was also found between MDD and per-capita income. It has been observed that women of reproductive age group who have monthly per-capita income  $\geq 5000$  had 3.014 times higher odds of attaining MDD as compared to those who have per-capita income  $<5000$  per month. This finding is consistent with the study conducted by Ajani SR<sup>[8]</sup> which also states that household size and family income have an effect on the dietary diversity. If per capita income increases then dietary diversity score increases and diets become more diversified. If the food items are considered in our study, then about 100% consumed cereals, grains and tubers which is consistent with the study conducted by Willy K et al.<sup>[9]</sup> In that study, the high consumption of food items from the grains and grain products, by almost all respondents (99.2%) confirms that diets of women were predominantly based on starchy staples. Rebecca K. Campbell et al.<sup>[10]</sup> in their study conducted in Nepal found that women of lower socioeconomic status consumed less pulses, legumes and nuts, milk

and milk products, tubers, fruits and vegetables, and miscellaneous snacks than women of higher means.

## CONCLUSION

MDD-W is a dichotomous indicator of whether or not women 15-49 years of age have consumed at least five out of ten defined food groups the previous day or night.<sup>[1]</sup> To find out the proportion of WRA that had attained MDD-W, a study was conducted in the urban field practice area, VIMSAR, Burla where 5 AWCs were selected by simple random sampling method and in that 5 AWCs, 150 non-pregnant non-lactating (NPNL) women of reproductive age groups (15-49 years) had participated willingly. The mean age of the study subject was 28.25 years. Majority of them had dietary diversity score above 5 and 4 respectively. Mean BMI was 20.8 kg/m<sup>2</sup>. 67% of them had a Normal BMI range. One third (about 29%) of them were malnourished and 4% were overweight. The result also showed that 49.12% of WRA with normal BMI, 8.03% participants among underweight and 42.85% of participants among overweight had attained MDD-W. It has been seen that those who are working and are having better per capita income have better dietary diversity score. Also the results of our study showed that MDD-W had significant statistical relationship with BMI and per capita income. Proportion of WRA who have BMI  $>21.5$  had 3.371 times higher odds of attaining MDD as compared to those who have BMI  $\leq 21.5$ . Likewise Proportion of WRA with monthly per capita income  $\geq 5000$  had 3.014 times higher odds of attaining MDD as compared to those with per capita income  $< 5000$  per month.

The study revealed that more than half of WRA failed to achieve MDD and those subjects with better dietary diversity score had their body mass index in the normal range. Based on findings, information, education and communication activities are recommended with an emphasis on locally available, low-cost nutrition diet. Overall improvement of socio-economic condition and level of education of the residents of the area will go a long way to solve this public health problem of hidden hunger.

## REFERENCES

1. FAO and FHI 360. Minimum Dietary Diversity for Women: A Guide for Measurement. Rome: FAO; 2016, p 1-2.
2. Pal Manika, Paul Bobby, Dasgupta Aparajita. Dietary Diversity Among Women of

- Reproductive Age : New evidence from an observational study in a slum of Kolkata. International Journal of Medical Science and Public Health 2017, Vol 6, Issue 8.
3. Development of a Dichotomous Indicator for Population-Level Assessment of Dietary Diversity in Women of Reproductive Age. Women's Dietary Diversity Project (WDDP) Study Group. Current Developments in Nutrition, Volume 1, Issue 12, 1 December 2017.
  4. Shashikanta SK, Sheethal MP, Vishma BK. Dietary diversity among women in the reproductive age group in a rural field practice of a medical college in Mandya district, Karnataka, India. Int J Community Med Public Health. 2016;3:746-9.
  5. Gina Kennedy, Terri Ballard, MarieClaudeDop. Nutrition and Consumer Protection Division, Food and Agriculture Organization of the United Nations :Guidelines for Measuring Household and Individual Dietary Diversity, p 7.
  6. FAO and FHI 360. Minimum Dietary Diversity for Women: A Guide for Measurement. Rome: FAO; 2016, p 24.
  7. FAO and FHI 360. Minimum Dietary Diversity for Women: A Guide for Measurement. Rome: FAO; 2016, p 19-20.
  8. SanusiRasaki Ajani and Badejo, Catherine Adebuloka . An Assessment of Dietary Diversity in Six Nigerian states. African Journal of Biomedical Research 2010, Vol 13, No. 3, p161-167.
  9. Kiboi Willy, Kimiywe Judith, ChegePeter : Dietary diversity, nutrient intake and additional nutrient status in pregnant women in Laikipia country, Kenya.BMC Nutrition(2017) 3:12,p3-8.
- Campbell RK, Talegawkar SA, Parul C, LeClerq SC. Seasonal dietary intakes and socioeconomic status among women in the Terai of Nepal. J Health Popul Nutr. 2014;32(2):198-216.