



# Maternal Malnutrition in Urban India: A Study of Indian Cities (Mega, Large and Small)

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Available online at: [www.isca.in](http://www.isca.in)

Received 19<sup>th</sup> December 2015, revised 7<sup>th</sup> January 2016, accepted 13<sup>th</sup> January 2016

## Abstract

*Maternal malnutrition is a serious public health problem. It does not only affect mothers' health but also severely affects the future generations. The present study aims to examine status of malnutrition among women in Indian cities (Mega, Large and Small). It also examines the differentials in malnutrition among women by socio economic factors. This study utilized the data from the National Family Health Survey-3(2005-06). Cross tabulation and a binary logistic regression was used to analyze the data. The study revealed that overall, 23.2% women in Indian cities (Mega, large and small) were undernourished having BMI<18.5. Higher proportion of undernourished women was in small cities (25.6%) and that of the lowest in mega cities (18.7%). overall, 48.8% women were anemic for taking cities as one unit. Separately, the highest proportion of anemic women were observed in small cities (50.4%) followed by large cities (48.0%) and the least in mega cities (46.4%). There were widespread differentials in body mass index and being anemic by age groups, marital status, social groups, religious affiliations, highest education level, wealth index and standard of living of women in these three types of cities.*

**Keywords:** Maternal Malnutrition, public health, Body Mass Index, Anemic, Indian Cities

## Introduction

The health of Indian women is directly associated with their status in Indian society. Indian women are still second to man in every walks of life viz., equality, education, employment, health, marriage, family affairs etc. due to historical wrongs. Most of them (women) are economically dependent upon male ones. Woman's contribution to family income is underestimated and they are considered economic burden for host of reasons. Women are poorly represented in governance and decision making institutions. Even, most women do not have any autonomy in decision making in their personal lives. Some positives changes have taken place in status of women in post independent India. But condition is still not so satisfactory. Even in 21<sup>st</sup> century, the position and respect for women is deteriorated after so many constitutional provisions<sup>1</sup>. The crime against women in terms of sexual harassment, dowry deaths, and domestic violence are still on rampant. These all cause poor health of Indian women. Poor health has multiple dimensions. Malnutrition or under nutrition is one of the dimension of women's poor health.

Malnutrition generally refers both to under nutrition and over nutrition. Many factors can cause malnutrition, most of which relate to poor diet or severe and repeated infections, particularly in underprivileged populations. Inadequate diet and disease, in turn, are closely linked to the general standard of living, the environmental conditions, and whether a population is able to meet its basic needs such as food, housing and health care. Malnutrition is a serious public-health

problem that has been linked to a substantial increase in the risk of mortality and morbidity<sup>2</sup>. If the sufferers happen to be a mother, is known as Maternal Malnutrition.

The state of maternal nutrition is one of the important environmental factors which might be expected to influence the course of pregnancy<sup>3</sup>. Undernourished women are more likely to deliver low weight babies or undernourished babies<sup>4</sup>. A low birth weight babies born of undernourished mother are more prone to disease and premature death which further diminishes the economic development not only of the family but also of society, and keep on the cycle of poverty and malnutrition. Malnourished children grow up to be with low productivity, aptitudes, and skills, and hence keep on the cycle of poverty.

The proportion of under nutrition among women in India is one of the highest in the world. It may be authenticated by several empirical studies. In India, anemia is the 2<sup>nd</sup> most common cause of maternal death accounting 19% of total maternal deaths. The prevalence of anemia in India is 60-70 percentage<sup>5</sup>. India has not only a large number of malnourished women; it also has one of the highest proportions of malnourished women in the developing countries<sup>6</sup>. The prevalence of low birth weight (LBW) is higher in Asia than elsewhere, predominantly because of under nutrition of the mother prior to and during pregnancy. Nearly half the pregnant women still suffer from varying degree of anemia, with the highest prevalence in India, which also has the highest number of maternal deaths in the Asian region<sup>7</sup>.

There are multiple and complex reasons for high malnutrition among in India. Discriminatory practices associates with rigid social norms. Poverty also seems one of the basic causes of malnutrition. Because of prevailing culture and traditional practices in India, health and nutritional status of women are becoming worse affected<sup>8</sup>. The nutrition and health care among young women are influenced by several factors, most important being the socio-economic status<sup>9</sup>. Nutritional status of was found to be positively related with any level of education and mode of payment<sup>10</sup>. Socio-cultural and economic reasons have cited for high maternal malnutrition in India. It is well established fact that Urban India is considered better off in terms of social norms rigidity, educational attainment as well as in economic prosperity. Under these backgrounds, present paper aims to examine the status of malnutrition among women in Indian cities delineated as Mega, Large and Small. It also examines the differentials in malnutrition among women by socio-economic factors.

## Methodology

This study is based on the National representative data i.e., the National Family Health Survey 2005-06(NFHS-3). In this survey, the nutritional status, height and weight of women were measured and blood samples were collected to assess the level of anemia. For present purpose, the Sample of ever-married women aged 15-49 years from cities (mega, large and small) was taken into consideration. Two variables viz., Body Mass Index (BMI) and anemia level of women aged 15-49 years were taken to examine maternal malnutrition. A direct variable 'body mass index of the respondent' has been given in the data set of NFHS-3. A cut point of 18.5 was used to define nutritional deficiency. Second variable 'anemia level' has been given with four responses viz., severe, moderate, mild and not anemic. For present purpose, the very variable was recorded as anemic or not anemic taking first three as one group (anemic). Cross tabulation and Binary logistic regression were used to analyze the data.

## Results and Discussion

**Results:** Table 1 showed that overall, 23.2% women in Indian cities (Mega, large and small) were undernourished having BMI<18.5. Higher proportion of undernourished women was in small cities (25.6%) and that of the lowest in mega cities (18.7%). There was an inverse relationship between proportion of malnourished women and size of cities. Large ( $p<0.001$ ) and small cities ( $p<0.001$ ) were more likely to have undernourished women as compared to mega cities as shown in table 3. The highest proportion of undernourished women (42.5%) was in age group 15-19 years and that of the lowest (11.0%) was in the age group 40-49 years. There was an inverse relationship between proportion of undernourished women and age groups i.e. older age group women were lesser malnourished for cities as a whole. Similar results were observed not only for overall cities (aggregate total) but also

separately for mega, large and small cities. As per odds ratio shown in table 3, women of age groups 20-29 years( $p<0.001$ ), 30-39 years ( $p<0.001$ ) and 40-49 years ( $p<0.001$ ) were less likely to be under nourished as compared to women of age group 15-19 years.

The highest proportion of undernourished women (38.3%) was in never married group while the least proportion of under nourished women (17.8%) was in married group for cities as a whole. And, similar results were observed for each type of city. As per odds ratio, never married women were more likely to be under nourished ( $p<0.001$ ) as compared to married women. The highest proportion of under nourished women was found among STs Category (33.9%) and the least proportion of malnourished women was found in others category (19.2%). For each social group, higher proportion of under nourished women was found in small cities and that of the least in mega cities. Women from other category of social group were less likely to be under nourished ( $p<0.001$ ) as compared to Scheduled tribe population of the overall cities. Higher women from Muslim religion (24.4%) were under nourished and the least women from Christian religion (15.5%) were under nourished in the cities as a whole. On observing separately, in two cities viz., large and small, results were similar while in mega cities, higher Hindu women (18.8%) were under nourished. Women from Muslim religion ( $P<0.01$ ) and Christian religion ( $p<.001$ ) were more and less likely to be under nourished respectively as compared to women from Hindu religion.

Women with no education had the highest proportion of undernourished (26.1%) while the least proportion of undernourished women (14.9%) was observed among women with higher education. higher the level of education there was lesser the proportion of undernourished women for taking three types of cities as one unit. Similar result was observed in large cities while in mega and small cities, higher proportion of undernourished women came from women having primary education. Women having higher education were less likely to be under nourished ( $p<0.001$ ). Higher proportion (39.9%) of malnourished women was observed from poor group and that of the least proportion (20.9%) was observed among rich group of women. Women from middle ( $p<0.001$ ) and rich ( $p<0.001$ ) group were less likely to be undernourished as compared to poor women. There was an inverse relationship between standard of living of women and proportion of under nourished women for cities as a whole and also separately for mega, large and small cities. 40.6 % of women from poor standard of living were malnourished while only 23.2% women from high standard of living were undernourished for cities as a whole. Women from medium ( $p<0.001$ ) and high standard of living ( $p<0.001$ ) were less likely to be undernourished as compared to women of low standard of living.

**Table-1**  
**Proportion of undernourished women in urban India**

Variables	Percent Women undernourished(BMI<18.5)			
	Mega Cities	Large Cities	Small Cities	Total
<b>Age Groups</b>				
15-19	41.3	40.7	44.4	42.5
20-29	22.7	25.6	29.0	26.7
30-39	10.5	14.6	16.9	15.0
40-49	5.2	9.6	14.2	11.0
<b>Marital Status</b>				
Married	12.8	17.1	20.1	17.8
Never Married	34.4	37.1	40.8	38.3
Widows/Divorced	15.9	19.2	25.5	21.6
Others	16.1	21.9	26.4	23.1
<b>Social Groups</b>				
STs	23.9	28.4	40.1	33.9
SCs	21.5	28.2	32.4	29.8
OBCs	20.0	24.1	27.1	25.0
Others	16.7	18.8	20.7	19.2
<b>Religious Groups</b>				
Hindu	18.8	22.4	25.8	23.4
Muslim	17.4	22.7	28.0	24.4
Christian	17.9	14.7	14.4	15.5
Others	20.6	19.4	19.6	19.7
<b>Highest Educational Level</b>				
No Education	14.7	25.4	29.1	26.1
Primary	17.1	23.7	29.8	25.5
Secondary	22.6	23.6	26.1	24.6
Higher	11.6	14.6	16.5	14.9
<b>Wealth Index</b>				
Poor	36.0	34.8	43.3	39.9
Middle	28.6	34.7	36.5	35.3
Rich	17.8	20.4	22.5	20.9
<b>Standard of Living</b>				
Low	37.8	34.3	44.4	40.6
Medium	24.6	31.4	32.2	30.9
High	16.7	19.5	21.4	19.8
Total	18.7	22.2	25.6	23.2

Source: computed from NFHS-3(2005-06)

**Table-2**  
**Proportion of anemic women in urban India**

Variables	Percent Women Anemic			
	Mega Cities	Large Cities	Small Cities	Total
<b>Age Groups</b>				
15-19	49.6	48.0	50.7	49.5
20-29	46.2	48.8	51.0	49.4
30-39	45.6	47.9	49.4	48.2
40-49	45.3	46.3	50.8	48.2
<b>Marital Status</b>				
Married	46.3	48.5	50.6	49.2
Never Married	46.3	45.3	49.1	47.2
Widows/Divorced	45.0	51.5	54.0	51.7
Others	58.9	62.5	57.9	59.9
<b>Social Groups</b>				
STs	53.6	45.5	65.8	56.6
SCs	51.4	52.8	55.1	53.7
OBCs	47.0	49.0	50.3	49.3
Others	44.0	45.7	48.3	46.5
<b>Religious Groups</b>				
Hindu	46.1	48.9	51.9	49.9
Muslim	49.0	45.7	49.3	47.8
Christian	42.4	41.4	33.4	38.0
Others	46.3	41.0	35.3	39.7
<b>Highest Educational Level</b>				
No Education	47.6	53.2	55.4	53.7
Primary	50.0	52.8	54.7	53.3
Secondary	47.2	48.0	49.2	48.4
Higher	41.2	40.0	44.6	42.1
<b>Wealth Index</b>				
Poor	45.1	61.6	65.3	63.2
Middle	48.7	55.5	55.1	54.6
Rich	46.2	46.5	48.5	47.4
<b>Standard of Living</b>				
Low	47.3	58.8	65.1	61.6
Medium	51.1	54.5	55.0	54.3
High	45.0	45.6	47.7	46.4
Total	46.4	48.0	50.4	48.8

Source: computed from NFHS-3(2005-06)

**Table-3**  
**Results of Binary Logistic Regression taking undernourished and anemic as Dependent Variables**

Variables	Dependent Variables	
	Whether undernourished(BMI<18.5)	Whether anemic
Age Groups	Odds Ratio	Odds Ratio
15-19(Reference Category)		
20-29	0.483***	0.967
30-39	0.238***	0.922*
40-49	0.150***	0.950
<b>Marital Status</b>		
Married (Reference Category)		
Never Married	2.891***	0.921**
Widows/Divorced	1.049	1.012
Others	1.312*	1.466***
<b>Social Groups</b>		
STs(Reference Category)		
SCs	1.288***	1.249***
OBCs	1.020	1.107
Others	0.714***	1.014
<b>Religious Groups</b>		
Hindu(Reference Category)		
Muslim	1.099**	0.955
Christian	0.581***	0.603***
Others	0.971	0.716***
<b>Highest Educational Level</b>		
No Education(Reference Category)		
Primary	0.958	0.979
Secondary	0.989	0.853***
Higher	0.522***	0.668***
<b>Wealth Index</b>		
Poor(Reference Category)		
Middle	0.764***	0.810**
Rich	0.386***	0.588***
<b>Standard of Living</b>		
Low(Reference Category)		
Medium	0.698***	0.757***
High	0.378***	0.570***
<b>Cities</b>		
Mega(Reference Category)		
Large	1.368***	1.044
Small	1.377***	1.011
p* < 0.05, p** < 0.01, p*** < 0.001		

As per table 2, overall, 48.8% women were anemic for taking cities as one unit. Separately, the highest proportion of anemic women were observed in small cities (50.4%) followed by large cities (48.0%) and the least in mega cities (46.4%). The highest proportion of anemic women (49.5%) was found in the age group 15-19 years and that of the least (48.2%) in the age group 40-49 years. The result was similar in mega cities but in large (48.8%) and small cities (51.0%), the highest proportion of under nourished women was from age groups 20-29 years. Women of age group 30-39 years were less likely to anemic ( $p<0.05$ ) as compared to women of age group 15-19 years. Widows/divorced women (51.7%) were higher anemic followed by married (49.2%) and the least for the never married (47.2%) for the three types of cities treating as one unit. The results were similar for large and small cities while in mega cities higher proportion of anemic women were from never married and married group with equal proportions of anemic (46.3%). Never married women were less likely to be under nourished as compared to married ones ( $p<0.01$ ).

Higher proportion of women from STs Category (56.6%) was anemic followed by SCs (53.7%) and the least from other category (46.5%). Similar results were observed in mega and small cities while in large cities higher proportion of anemic women from SCs (52.8%) followed by OBCs (49.0%) and the least among STs Category (45.5%). Women from SCs category were more likely to be anemic as compared to women belonging to STs Category ( $p<0.001$ ). Overall, higher proportion of anemic women was observed among Hindus (49.9%) and followed by Muslims women (47.8%) and the least was observed among Christian women (38.0%). Similar results were observed in large and small cities but in mega cities, higher proportion of anemic women was from Muslim (49.0%) followed by Hindus (46.1%) and again the least proportion was observed among women belonging to Christian Religion (42.4%). Women from Christian religion were less likely to be anemic as compared to Hindu women ( $p<0.001$ ).

There was an inverse relationship between proportion of anemic women and their education level for the entire cities as a whole and similar results were observed for large and small cities. But in mega cities, higher proportion of anemic women were observed among women with primary educating followed by no education and the least was for women with higher education. Women with secondary and higher education were less likely to anemic (for both at  $p<0.001$ ) as compared to women having no education. Higher proportion of poor women (63.2%) were anemic and that of the lowest among rich women (47.4%). The results were similar for large and small cities. But in mega cities, the highest proportion of anemic women (48.7%) was from Middle wealth index. Women from middle ( $p<0.01$ ) and rich ( $p<0.001$ ) group were less likely to be anemic. Higher proportion of anemic women (61.6%) was observed among women of low standard of living followed by women of medium standard of living (54.3%). Similar results were found for large and small cities. In mega

cities, the highest proportion of anemic women (51.1%) were found among women having medium standard of living and the followed by the women been from low standard of living (47.3%).

**Discussion:** The empirical results revealed that malnutrition measured in terms of body mass index and being anemic or not were pervasive in the population under study at substantial level. The obtained results were in line with previous studies<sup>5-7</sup>. The present study was intended to examine association of socio economic factors with degree of malnutrition among women measured by body mass index and women being anemic or not. It is to note that most of the factors like age groups, marital status, social groups, religious groups, highest education level, wealth index and standard of living and type of cities did have direct or indirect association with degree of malnutrition in population taken into consideration. The results were consistent with previous studies<sup>6,9</sup>.

There were some anomalies in this study. For instance, higher proportion of women from OBCs and others were anemic as compared to STs Category in large cities. This result was not in expected line i.e. STs Women were expected to have higher proportion of anemic women but it was higher among women from OBCs and Others. This might be attributed to sampling size of STs Population from large cities. Some studies claim that the prevailing culture and traditional practices in India immensely affect the nutritional status of women. But, present study did not take into consideration of these factors and it was one of the limitations of this study. Maternal malnutrition do have tendency to cause serious public health problem. It does not only drive the family to drain of the poverty but it also severely affects the future generations. Ultimately, it diminishes the quality of life of the population. Further study is sought to examine whether even in 21<sup>st</sup> century- the age of information sharing, cultural and traditional practices are playing its role in determining the nutritional status of women.

## Conclusion

A Substantial proportion of women suffered from malnutrition in Indian cities. Widespread socioeconomic differentials were observed in maternal malnutrition. Maternal malnutrition is a very serious public health problem. It has lasting ill effects on maternal and child health. This problem should be addressed on priority basis due to its implications for public health. Target group centric policies should be intervened to curb such problems.

## Acknowledgement

The author is very grateful to Prof. Ravi S. Srivastava, Prof. P.M. Kulkarni, and Mr. K. Verghese for teaching and guidance.

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