



# Association of Maternal Bio-social Determinants with Birth Weight in Urban Slums of Jammu City

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## Abstract

A community based prospective study was conducted to find the association of maternal bio-social determinants with birth weight in urban slums. A random sample of 50 AWCs (7 AWC from each zone) catering the population of urban slums and constituting about 25% of the total was taken giving due representation to all zones. 303 expectant mothers registered with AWCs in their third trimester (>28 weeks of gestation) were followed till 7 days after delivery. The incidence of low birth weight in the study group was 23.1. The average birth weight of low birth weight babies was  $1.98 + 0.47$ , while that in the normal birth weight of babies was  $2.73 + 0.20$ . It was found that factors such as low maternal age, height, parity and occupation of mother are significantly associated with low birth weight babies.

## Key Words

Urban slums, AWC (Anganwadi centers), Birth weight

## Introduction

The rapid urbanization in recent decades has resulted in migration of people from rural to urban localities and has led to increase in number of urban poor population many of whom live in slums and other squatter settlements. The urban slums are deprived human settlements, which are demographically, economically and environmentally vulnerable and dwellers are exposed to poor environmental conditions due to poverty, overcrowding and lack of an organized health structure, thus the health in urban slum presents a serious public health concern.

It is a universally known fact that maternal wellbeing is related to neonatal health. The pregnant mother and her neonate form the vulnerable sector of our society. About 3-8 million deaths occur every year in babies younger than 28 days-of which 99% are in the developing world-and deaths in the first month of life account for 42% of deaths in children younger than 5 years(1). Irrespective of the primary cause of death, over two third of deaths occur in low birth weight infants weighing less than 2500 grams (2). It is estimated globally that more than 20 million infants, representing 15.5% of all births are born with LBW. 95.6% of these LBW babies are

born in developing countries (3). More than half of them are born in South Asia, which has the highest incidence of low birth weight by far, at 27 per cent. India, one of the countries with the highest incidence, has the highest number of low-birth weight babies each year: 7.5 million (4).

Birth weight is influenced by hereditary and environmental factors which include health and nutritional status of mother, maternal age, early age at conception, inter-pregnancy interval, parity, inadequate care during pregnancy.

Most of the information regarding the biosocial determinants and their association with birth weight is hospital based and does not reflect the real situation in a community. Hence in this context, present study is being conducted in urban slums of Jammu city.

## Material and Method

A prospective study for a period of one year was conducted to find the association of birth weight with maternal biosocial determinants. All pregnant women registered and attending Anganwadi Centres in different slums constituted the sampling frame for the present study. The urban slums and all Anganwadi centres

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functional in these slums were listed zone wise and from each of these eight zones, seven Anganwadi centres (AWCs) were selected using table of random numbers. Thus, a total of 56 AWCs were selected randomly which amounted to approximately 25% of the total functional AWCs in the study area. . Cases of twin pregnancy and women who could not be followed for two consecutive after initial contact were excluded from the study. A total of 303 expectant mothers who were registered with these AWCs and were in their third trimester (>28 weeks of gestation) were enrolled after briefing them about the purpose of the study and after obtaining verbal consent from them. All enrolled women were followed till 7 days after delivery. The frequency of contacts with the enrolled women at AWCs depended on the gestational age at first contact. The postnatal contacts were made twice to access the outcome of delivery, first visit as soon as

possible after delivery and second within 7 days. Birth weight of newborn was recorded during the first postnatal contact. The females were interviewed in accordance with the pre-structured proforma and subjected to physical examination using standard criteria.

#### Statistical Analysis

The birth weight was then co-related with variables using software MS excel & SPSS 12.0 for windows. Birth weight was assessed by using chi-square test/ fischer's exact test and the strength of their association was computed by crude odd's ratio (95% confidence intervals).

#### Results

In the study 303 pregnant women were followed up during their pregnancy and the birth weight of their newborns was noted. The incidence of low birth weight in the study group was 23.1. The average birth weight of

**Table 1. Relationship between Mother's Age and Birth Weight of Newborn**

Mothers age in years	No. of women	Birth Weight >2500gms		Birth weight <2500gms		Crude odds ratio	Confidence interval
		n	%	n	%		
<19	6	5	83.3	1	16.7	1.03	0.17-6.26
19-30	233	195	83.6	38	16.4	1.00(ref)	
30-40	64	33	51.5	31	48.5	4.82	2.53-9.19
Total	303	233	76.9	70	23.1		

$\chi^2$   $df=(2)$  29.90  $p=0.0001$  Highly significant

**Table 2. Maternal Education and Birth Weight of the Newborn**

Literacy of Females	Birth Weight >2500gms		Birth Weight <2500gms		Total	Crude Odd's Ratio	Confidence Interval
	n	%	n	%			
Illiterate & Just Literate	73	70.2	31	29.8	104	1.78	0.90-3.53
Primary	36	85.7	6	14.3	42	0.70	0.23-2.03
Middle	36	75.0	12	25.0	48	1.40	0.58-3.36
Matric & Above	88	80.7	21	19.3	109	1.00	
Total	233	76.9	70	23.1	303		

$\chi^2$   $df=(3)$  5.47  $p=0.14$  Non Significant

**Table 3. Association of Maternal Height with Birth Weight of Newborn**

Height (cms)	Birth Weight >2500gms		Birth Weight <2500gms		Total	Crude Odd's Ratio	Confidence Interval
	n	%	n	%			
>150	205	82	45	18	250	1.00(ref)	
145-150	26	59.1	18	40.9	44	15.94	2.9-115.2
<145	2	22.2	7	77.8	9	3.15	1.51-6.58
Total	233	76.9	70	23.1	303		

$\chi^2$   $df=(2)$  15.80  $p=0.0002$  Highly Significant

**Table 4. Pregnancy Outcome According to Occupation of Females**

Occupation	Pregnancy Outcome				Total	Crude Odd's Ratio	Confidence Interval
	Favourable n	%	Adverse n	%			
Labour Class	20	57.1	15	42.9	35	3.14	1.42-6.99
Other Classes	213	79.5	55	20.5	268	1.00(ref)	
Total	233	76.9	70	23.1	303		

Yates corrected  $\chi^2$   $df= (1) 8.79$   $p=0.0003$  Highly Significant

**Table 5. Association of Parity with Birth Weight of Newborn**

Parity	Birth Weight >2500gms		Birth Weight >2500gms		Total	Crude Odd's Ratio	Confidence Interval
	n	%	n	%			
2-4	146	81.1	34	18.9	180	1.00(ref)	
5	Nil		5	100	5	Undefined	-
1	87	73.7	31	26.3	118	14.29	3.57-59.85
Total	233	76.9	70	23.1	303		

$\chi^2$   $df= (2) 19.11$   $p=0.0007$  Highly Significant

low birth weight babies was  $1.98 \pm 0.47$ , while that the weight of normal birth weight babies was  $2.73 \pm 0.20$ .

Incidence of low birth weight was higher in extreme ages as evident by OR of 4.82 in age groups of 30-40 years with statistically significant association. (P 0.0001). *Table-1* An illiterate and just literate female had 1.78 times risk of low birth weight as compared to women who were educated up to and above matric but no significant association could be established between educational status and low birth weight. *Table 2*.

As regard maternal height, 77.8% mothers with height less than 145cm delivered low birth weight babies when compared to 18% of mothers with height >150cm who delivered LBW and the association was statistically significant at p value of 0.0002. *Table 3*

It was observed that among 35 women engaged in labour class 42.9% had low birth weight babies whereas in women engaged in other occupations only 20.5% babies born were low birth weight. This association was found to be statistically significant (p 0.0003). *Table 4* Parity is significantly associated with birth weight, LBW being most common in grandmultipara followed by primipara with odds ratio of 14.29. *Table-5*

### Discussion

The incidence of low birth weight in the study group was 23.1. In the present study, 48.5% of pregnancies in females between the age group of 30-40 years gave birth to low birth weight babies. These findings are in accordance with the findings of Ghosh *et al*, (5) Kaushik *et al* (6) and Misra *et al* (7).

Literacy rate in the present study was 68.7% which is higher than national figures 54% (8). Though the low birth weight was observed to be more in illiterate women as compared to literate ones but the association was not statistically significant and was in accordance with the studies conducted by Gawande UH (9) & Malik Sushama (10). Mothers giving birth to low birth weight babies have been found to be significantly shorter than those giving birth to normal babies in the present study. Similar studies conducted by other authors Dhalla *et al* (11), Deshmukh *et al* (12), Lala and Talsania (13), Mc Dermott *et al* (14) and Trivedi (15) also reported that the women having height of <145 cms have more chances of low birth weight babies than those having height >150 cms.

It was observed that parity and low birth weight were correlated. The incidence of low birth was highest (100%) in females with para 5 or more followed by nulliparous women (26.2%). The association was also found to be statistically significant. Similar findings have been reported by Abu *et al* (16), Chandershekhar *et al* (17) and Kumar Rajesh *et al* (18).

Only 11.5% of the study subjects belonged to labour class but 42.9% of them had given birth to low birth weight babies which was also found to be statistically significant. Similar findings were observed by Fikree FF and (19) Gray R.H (20) in their study.

### Conclusion

Our study concluded with the findings that biosocial determinant such as maternal age, height, education; parity and occupation are associated with incidence of low birth weight.



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