

1 A Study of Prevalence and Sociodemographic Determinants for
2 Low Birth Weight, Hospital Based Cross–Sectional Study in,
3 Maharashtra India.

4

5 **Abstract Background** :The birth weight one of the most important determinant of
6 its chances of survival, healthy growth and development.LBW significantly contributes to
7 various health disorders in both children and adults, linking it to severe malnutrition in
8 children under five, poor psychomotor development, and lower educational performance.

9 **Objectives:** To determine the prevalence of low birth weight and various determinants
10 associated with low birth weight in tertiary care hospital.

11 **Results:** In present study over all prevalence of low-birth-weight was 70 (37.23%) 54% male
12 and 46% female, no sex wise significant difference was found. 55(79%) LBW new born from
13 rural area and 15(21%) from urban area it shows significant difference ($p < 0.001$). Most of
14 the LBW baby 39 (56%) from joint family followed by 31(44%) nuclear family no statistically
15 difference was found, 33(47%) was in 1st birth order followed by 10(14) % 3rd birth order and
16 the difference was statically significant ($p < 0.001$). The present study has identified a
17 significant association between place of residence, religion, mother's education, non-
18 working mothers, father's education, and non-working fathers

19 **Discussion** The socio-demographic factors considered in other studies are totally different
20 than the mentioned studies so our study cannot be compared. During this study, we couldn't
21 find any other study with similar factors.present study has identified a significant association
22 between place of residence, religion, mother's education, non-working mothers, father's
23 education, and non-working fathers .

24 **Conclusion:**education plays an important role in improving health seeking behaviour, social
25 status, living standard and health services utilization. Literacy status should be improved by
26 enhancing the school enrollment and decreasing school drop-out rate. Future research is
27 needed to identify the factors responsible for low birth weight.

28 **Keyword:** Birth weight, place of residence, mothers occupation education, fathers
29 occupation and education, birth order, working, non working.

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31 1.Introduction

32 Birth weight serves as both a crucial measure of maternal well-being and a strong
33 predictor of neonatal and childhood health outcomes. The newborn's birth weight is
34 ideally documented within the first hours of delivery and captured before significant
35 postnatal weight loss takes place. A newborn with low birth weight (LBW) is
36 characterized as a live baby weighing less than 2,500 grams at birth. According to
37 WHO estimates, approximately 25 million babies with LBW are born annually, and 5
38 million of them experience global mortality¹. Birth weight is the first weight of new
39 born obtained after birth. For the live birth, birthweight should preferably measure
40 within first hour of life, before significant post-natal weight loss has been occurred².
41 Birth weight is one of the most important criteria for determining the neonatal and
42 infant survival. Low birth weight (LBW) has been defined by the World Health
43 Organization (WHO) as weight at birth of less than 2500 g³.

44 This practical cut off for international comparison is based on epidemiological
45 observations that infants weighing less than 2500 g are approximately 20 times more
46 likely to die than heavier babies⁴. Birth weight is a useful parameter in predicting the
47 future growth and development of child. It can be used in identifying "at-risk" families
48 and help in decision making during the implementation of intervention programs,
49 especially in countries and regions with limited resources⁵.

50 The prevention of LBW is a public health priority, particularly in developing countries
51 with high prevalence. Majority of the studies focused on the maternal factors; there
52 are very few studies that analysed the socio demographic variables. Studies done in
53 India suggest that, factors associated with LBW differ from one area to another,
54 again in the state Odisha it differs from district to districts and majority of neonatal
55 mortality in this setup in recent past were LBW and belongs to low socioeconomic
56 status. Hence, the present study was done to measure the proportion of LBW babies
57 and its association with maternal socio-demographic factors⁶.

58 LBW significantly contributes to various health disorders in both children and adults,
59 linking it to severe malnutrition in children under five, poor psychomotor
60 development, and lower educational performance. Various maternal factors,
61 including intrauterine growth failure, short gestational periods, education levels,
62 income, place of residence, maternal age, and the number of antenatal care visits,
63 also influence this pathophysiology⁷.

64 It estimated that the risk of neonatal mortality for low-birth-weight infant 20 time more
65 than for the infant with birth weight exceeding 2500grams, and increases sharply as
66 birth weight decreases⁸.

67 More than half of the infant's death occurs in first 28 days of life. Most of these take
68 place in first week of life. The major causes of these deaths are due to birth
69 asphyxia, hypothermia and infection but the baby born with low birth weight are
70 higher risk of dying. In developing countries infant mortality rate is very high as
71 compare to developed countries. Socio demographic characteristic such as parents'
72 education, maternal education, religion, type of family, place of residence, birth order,
73 such factor are also associated with low birth weight. With this background this
74 research was conducted to find out the prevalence and sociodemographic
75 determinates for low birth weight.

76 **2.Aims and objectives**

77 To determine the prevalence of low birth weight and various determinants associated
78 with low birth weight in tertiary care hospital.

79 **3. Material and Method**

80 The present study was conducted obstetric ward, labour room and of Government
81 Medical College Akola Maharashtra. Ethical was taken. The study was conducted
82 from January 2024 to December 2025 for the period of one year. The study subject
83 was all the mother who undergone delivery, at government medical college Akola.
84 Purposive sampling method was used to select study population. Informed written
85 consent was taken after explaining the purpose of study. The mother those who not
86 in the position to provide the required⁷ information were excluded from the study.

87 The data was collected with the predesigned and pre tested questionnaire the
88 information regarding age, sex, place of residence, place of residence, type of family,

89 birth order, religion mothers' education occupation and father education and
90 occupation was collected. All the babies were weighed on calibrated baby weighing
91 scale machine (max weight 10kg) 10-gram accuracy. Low birth was defined as birth
92 weight of <2500 g.

93 Some operational definition

94 Newborn weight is first weight of obtained after birth as a significant postnatal weight
95 seen in few hour birth weight should preferably measure within first hour of life

96 Low birth weight is defined as weight less than 2,500g.

97 Very low birth weight less than 1.500g

98 Extremely low birth weight less than 1.000g.

99 Statical analysis: frequency and percentage were used for categorical variables to
100 summarised data. Difference was assessed by employing Chi-square test
101 categorical variables. In order to investigate the association of predictor variables
102 with outcome variable (LBW) all analysis were performed using EPI-6 Software
103 version2.3.

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108 **4. Results**

109 **Table no 1.** Sociodemographic characteristics of study population

Sex wise distribution		
Male	98	52%
Female	90	48%
Total	188	100%
Place of Residence		
Urban	57	30%
Rural	131	70%

Total	188	100%
Type of Family		
Nuclear	79	42%
Joint	109	58%
Total	188	100%
Birth Order		
1	88	47%
2	67	36%
3	26	14%
4	5	2.6
>4	1	0.4
Total	188	100%
Religion		
Hindu	139	74%
Muslim	42	22%
Bouddha	6	4%
Sikh and Others	0	0%
Total	188	100%
Mother's Education		
Illiterate	12	6%
Primary	20	10%
Secondary	72	41%
11 th and 12 th	57	30%
Graduate and above	27	13%
Total	188	100%
Mother's Occupation		
Non-working	168	89%
Working	20	11%
Total	188	100%
Father's Education		
Illiterate	8	4%
Primary	16	8%

Secondary	64	34%
11 th and 12 th	55	29%
Graduate and above	45	25%
Total	188	100%
Father's Occupation		
Non worker	0	0%
Service	20	11%
Farmer	68	36%
Skilled work	32	17%
Business	28	15%
Daily labor	40	21%
Total	188	100%

110 Table no 1 Shows a total 188 newborn out of which 98(52%) male and female
111 90(48%) newborn so, there is no significant sex wise variation in this study most of
112 them were from rural area 131(70%) with joint family 109(58%). In the present study
113 majority of newborn were having birth order1. 88(47%) followed by birth order 2.
114 36(67%) only 1 (0.4%) new born were in birth order 4 majority among them were
115 Hindu 139(74%) followed by Muslim 42(22%). In this study most of study populations
116 mother were educated up to secondary schooling 72(41%) followed by 11 & 12
117 standard 57(30%) 168 (89%) were nonworking category. In our study most of the
118 father were educated up to secondary schooling 64(34%) followed by 11 and 12
119 standard 55(29%) and 68(36%%) farmers followed by 40(21%) daily laborers and
120 Skilled work 32(17%).

121 **Table no. 2** Distribution of low birth weight according to sociodemographic variable
122 of study participants

Characteristic	Birth Weight		Total	Chi-Square	p-value
	Normal	Low birth Weight			
Male	38 (54%)	60	98 (100)	0.51	0.47
Female	32 (46%)	58	90 (100)		
Place of residence					

Rural	55(79%)	2	57	22.86	< 0.001
Urban	15(21%)	116	131		
Type of Family					
Nuclear	31(44%)	48	79	0.91	0.33
Joint	39(56%)	70	109		
Birth Order					
1	33(47%)	55	88	56.71	< 0.001
2	24(34%)	43	67		
3	10 (14%)	16	26		
4	3(5%)	2	5		
>4	0 %		1		
Religion					
Hindu	50 (72%)	89	139	86.57	< 0.001
Muslim	15(22%)	27	42		
Bouddha	3(4%)	3	6		
Sikh and others	2 (2%)	00	0		
Mother's Education					
Primary education	7 (10%)	5	12	25.66	< 0.001
Secondary education	30 (43%)	10	20		
Higher Secondary	26 (37%)	46	72		
Graduate and above	7 (10%)	50	57		
Mother's occupation					
Non-working	57(81 %)	111	168	27.66	< 0.001
Working	13 (19%)	7	20		
Father's Education					
Illiterate	2 (3%)	6	8	37.01	< 0.001
Primary education	5 (7%)	11	16		

Secondary education	22 (31%)	42	64		
Higher secondary	29 (41%)	26	55		
Graduation and above	12 (18%)	33	45		
Father's Occupation					
Non working	0	0	0	40.90	< 0.001).
Service 10 (11%)		10	20		
Farmer	29 (36%)		68		
39					
Skilled worker	09(17%)	23	32		
Business07	15(%)	21	28		
Daily laborer	15 (21%)	25	40		

123

124 **Table 2.** Among the 188 newborns, In present study over all prevalence of low-birth-
125 weight was 70 (37.23%) 54% male and 46% female, no sex wise significant difference
126 was found. 55(79%) LBW newborn from rural area and 15(21%) from urban area it
127 shows significant difference ($p < 0.001$). Most of the LBW baby 39 (56%) from joint
128 family followed by 31(44%) nuclear family no statistically difference was found,
129 33(47%) was in 1st birth order followed by 10(14) % 3rd birth order and the difference
130 was statically significant ($p < 0.001$).

131 50(72%) newborn belonging to Hindu family followed by 15(22%) Muslim family this
132 religion was difference was also statically significant ($p < 0.001$). mothers' education
133 was found important role for low birth new born, maximum mother was educated up
134 to higher secondary 30(43%) followed by higher secondary 27(37%) here also the
135 difference was statically significant ($p < 0.001$). such difference was also observed in
136 Nonworking 57(81%) and working mothers 13(19%) statically significant ($p < 0.001$).
137 most of the father were educated up to Higer Secondary 29(41%) followed by
138 graduation 12(18%) and occupation wise 29(36%) farmer followed daily
139 laborer 15(21%) so above education and occupation also statically significant ($p <$
140 0.001).

141

142 **5. Discussion**

143 Low birth weight is major problem in developing countries. Asian countries for the
144 example, highest prevalence of total low birth by African and Latin America Asian
145 countries South Asia highest incidence (27%) of LBW. it is the high time to think LBW
146 as a public health problem⁹.

147 Children who survive LBW have a higher incidence of diseases, retardation in
148 cognitive development and undernourishment. There is also evidence that LBW or
149 its determinant factors are associated with a predisposition to higher rates of
150 diabetes, cardiac diseases and other future chronic health problems¹⁰.

151 In the present study prevalence of low birth weight was 37.23% which was
152 significantly associated with place of residence, birth order, religion, mothers'
153 education, mother occupation, fathers' education and fathers' occupation. The study
154 conducted by Mohd Maroof Lal Diwakar Singh, Seema barman, Navin Kumar
155 Santosh Kumar Burman in Banda district utter Pradesh in 2021-22 reported low birth
156 prevalence 27.9 %¹¹. Across-sectional study was conducted by Anjani Kumar
157 Srivastawa, Basavaraj Mannapur, Asok Dorle and Anjali Singh in 2021 in North
158 Karnataka and reported prevalence of low birth weight was 21%¹². The prevalence of
159 low birth weight was noted 36.33% in Nizamabad Telangana (A Hospital based cross
160 sectional study) by Amar Devguru, Sandeep Gada, Dnyaneshwar Potphale,
161 Mummareddi, Dinesh Ishwar, Dipti Purwar. So this study is similar to present study¹³.

162 The study conducted by Harsh Patel, Jitesh Mehata, Bela Patel, Rohitkumar Ram
163 and Dipesh Parmar in 2021 at Sourashtra region of Gujrat and reported 77%
164 newborn from housewife which was followed by 16.8% from labourer and 5.4% from
165 service, prevalence of low birth weight was statistically higher in mother who were
166 illiterate. Mothers education was statistically significant in the present study⁸.

167 Study carried out by Gururaj MS, Anitha N, Kulkarni AK, Rekha, in rural south India,
168 a hospital-based study Sulli in 2010 and observed maternal educational status have
169 most risk factors for low-birth weight babies along with maternal occupation was
170 statistically significant for low-birth weight.¹⁴

171 Damini Singh, Sayantani mamma, Manish Barik, Tanveer Rehman, Shreekantha
172 Kanugo, Sanghmitra Patil conducted the study from NFHS-5 has taken information
173 from 7 districts and 28 states and 8 union territory. They included the study
174 population 639,699 households in the year 2023 and observed that several
175 sociodemographic factors were potentially associated with maternal age, sex of
176 child, maternal education, place of residence.¹⁵

177 Ratna Panda, Pratibha Jena, Kavita Chanin, Dattatraya Kar conducted the study
178 from January to June 2019 (Case-control study) in IMS and SVM hospital
179 Bhubaneshwar and observed that primary and secondary education have lower
180 possibility of low birth weight however the disease condition like hypothyroidism and
181 pre-term delivery was associated with low birth weight.¹⁶

182 Ananya Roy, M. Zobaida Akter, Dhiraj Candra Biswas observed socioeconomic
183 condition of respondent mothers plays an important role in low birth weight.⁹

184 Ramesh Kumar Sangwan, Ramesh Kumar Huda, Mukti Khetan, Paul Gazta, Bonitha
185 V Babu carried out cross sectional the study Jalore district of Rajasthan in February
186 2021 to August 2022 and observed that low birth weight was prevalent in nuclear
187 families.¹⁷

188 The present study has identified a significant association between place of
189 residence, religion, mother's education, non-working mothers, father's education,
190 and non-working fathers. Maternal education and maternal occupation is associated
191 with low birth weight, reported by Gururaj M S, Anita N. Kulkarni and Rekha, so this
192 study is comparable with our study. Ratna Panda, Prathibha Jain conducted a case
193 control study in Bhubaneshwar, the educational status and disease condition like
194 hypothyroidism and preterm delivery was associated with low birth weight. However,
195 Damini Singh et. reported sex of the child and maternal education along with place of
196 residence are the risk factors for low birth weight. The socio-demographic factors
197 considered in this study are totally different than the above mentioned studies so our
198 study cannot be compared. During this study, we couldn't find any other study with
199 similar factors.

200

201 **6. Conclusion**

202 The prevalence of low birth weight in our study was 37.23 % in the study population.
203 The study demographic determinants place of residence, religion, mother's
204 education, non-working mothers, father's education, and non-working fathers. So
205 education plays an important role in improving health seeking behaviour, social
206 status, living standard and health services utilization. Literacy status should be
207 improved by enhancing the school enrollment and decreasing school drop-out rate.
208 Future research is needed to identify the factors responsible for low birth weight.

209 **7 Limitation of study**

210 It is a hospital based study so result cannot be generalized. The study did not
211 include other obstetrical factor like nutritional factors of mother, infection during
212 pregnancy, complication during pregnancy which may have directly effect on low
213 birth weight.

214 **8.Financial support**

215 Nil

216 **9.Conflict of interest**

217 There is no conflict of interest

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UNDER PEER REVIEW