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The Risk of Adolescent Mothers having Low Birth Weight Babies in Rural Birbhum District during Covid Pandemic

Saikat Majumdar[1], Dr Ashoke Gorain[2], Dr Uttam Kumar Sikder[3]
[1]*Public Health Professional, Government of West Bengal and Research Scholar in Anthropology, Ranchi University, Jharkhand,*
[2] *Public Health Professional, Government of West Bengal, Academic Councilor, IGNOU, New Delhi*
[3]*Assistant Professor, Department of Economics & Polities, Visvs- Bharati (University)*

Abstract: Objective: The objective of this research is to determine the factors associated with low-birth-weight (LBW) infants in adolescent pregnancy.
Materials and Methods: A cross-sectional study was conducted from July 1, 2021, to 31 December 2021, in Rampurhat and Mallarpur areas of Birbhum district. Studies were included a sample of adolescent mothers (≤19 years) and adult mothers (≥20 years) who gave birth to singleton infants in rural Birbhum district, West Bengal. Multivariable logistic regression analysis was used to analyze the factors associated with LBW infants in adolescent and adult pregnancy.
Results: All 640 cases that fulfilled the study criteria were included. Of total mothers, over 37.19% were adolescence experiencing at least one pregnancy during the survey period. Of adolescent pregnancy, 24.79% delivered LBW babies; whereas the estimate was lower (17.41%) for adult women. Among adolescents, the 7.98% had abortion and 0.42% had stillbirths; whereas in case of adult women it was 6.22% and 1% respectively. Low birth weight babies increased during the COVID period for adolescent mothers. Odds ratio from Multivariate logistic regression suggests that adolescents are more likely to experience adverse birth outcome.
Conclusion: Adolescent mothers in study area are more likely to give birth to babies that are preterm, LBW, or stillborn than adult mothers. Although analysis demonstrates a higher prevalence of adverse birth outcomes among pregnant adolescents than among adult pregnant women, future research is needed to investigate the mechanisms surrounding these differences by maternal age and, ideally, also to compare differences between pregnancies in younger and older women.
Keywords: Pregnancy in adolescence, LBW, abortion, stillbirth

I. INTRODUCTION

An adolescent younger than 20 years in a state of pregnancy until delivery is more at risk of complications than women over the age of 20 years. Age, height and weight are common risks factors during first pregnancy, but giving birth at an early age will always have a negative impact on the condition of babies born; one of the risks in the newborn is Infant Low Birth Weight (LBW). Birth weight is one of the predictors for foetal growth, and it is a significant determinant of morbidity and mortality in infancy and childhood. LBW can predict short-term survival and influence the long-term health of the newborn [Risnes KR et al. 2011]. The World Health Assembly Resolution 65.6 endorsed a policy that aimed to reduce the prevalence of LBW by 30% between 2012 and 2025[WHO 2020].

Although biological immaturity of young mothers was long believed to be the reason for maternal complications and adverse birth outcomes in adolescent pregnancies [X.K. Chen et al. 2007], much research has shown that the correlation between adolescent pregnancies and poor birth outcomes is confounded by poverty and socioeconomic disadvantage in young women's lives [S.P.W. Wong et al. 2020, S. Amjad et al. 2019].

COVID-19 has upended the lives of children and families across the globe and adversely affected programmes to end child marriage. The pandemic is having a devastating effect on families, communities and economies. Child marriage has always been a common phenomenon. But ever since the COVID 19 pandemic hit, the child marriage and teenage pregnancy cases reported were significantly increased as the pandemic inhibited enforcement of the legal minimum age for marriage (UNICEF Report, 2022).

Adolescent pregnancy can lead to morbidities (such as sexually transmitted diseases), mental disorders (such as depression) as well as higher neonatal mortality [UNICEF, 2008].

II. MATERIALS AND METHODS

A cross sectional study included a sample of adolescent mothers (≤19 years) and adult mothers (≥20 years) who gave birth to singleton infants in rural areas of Birbhum district during June 2021 to December 2021. Data were collected from both tribal and non-tribal community; tribal people belonged to the Santal community and non-tribals were from Hindu and Muslim religions. Age of the participants was confirmed on the basis of birth certificate. For those who did not have a birth certificate, the school certificate, Voter ID card or Aadhaar card was carefully considered as a secondary source.

A. Outcome Variables

The dependent variable was low birth weight newborn baby and independent numerical variables were age, education status, gravida, number of iron and folic acid tables taken and quintile. Low birth weight has been defined by WHO as weight at birth of < 2500 grams. LBW was regrouped in binary (0 and 1) as it was treated as dependent variable.

B. Explanatory Variables

Religion was coded as Hindu, Muslim and Christian. Caste was recoded as Scheduled Tribes, Scheduled Castes, Other Backward Classes, and others. The Scheduled Castes include a group of the population that is socially segregated and financially/economically by their low status as per Hindu caste hierarchy. The Scheduled Castes and Scheduled Tribes are among the most disadvantaged socioeconomic groups in India. The Other Backward Classes are considered low in the traditional caste hierarchy, but include the intermediate socioeconomic groups. The "others" caste category is identified as those having higher social status.

Again, in the study, sanitation facility has been divided into categories such as no toilet, pit latrine and sanitary latrine. Here open defecation is represented by no toilet. Level of education has been divided into illiterate, read and write (education without formal education), 1-4 standard, 5- 8 standard, 9 -12 standard and college.

Iron and folic tablet once daily for a period of 100 days, starting after 12 weeks (first trimester) of pregnancy and hence a total of 100 tablets are to be dispensed. In research, the authors divided the period in two categories, those who have taken below 100 tablets and those who have taken 100 tablets and more.

These advantages of exclusive breastfeeding include a lower risk of gastrointestinal infection for the baby, more rapid maternal weight loss after birth, and delayed return of menstrual periods. Early initiation of breastfeeding within one hour of birth , exclusive breastfeeding for the first six months (180 days) for WHO guideline .

In the formation of quintile, five groups have been created such as poor, poor middle, middle, upper middle and upper. Quintile was calculated on the basis of type of house, type of fuel materials used for cooking, sanitation and household assets through principal components analysis (PCA) guidelines.

C. Data Analysis

Data were analyzed using Statistical Package Stata (Version 12). Continuous variables were summarized as the mean ± standard deviation. Multivariate logistic regression was conducted to explore the association between sociodemographic variables and low birth weight (LBW) parameters of the newborns. LBW was regrouped in binary (0 and 1) as it was treated as dependent variable. Statistical significance was determined at a p-value ≤ 0.05. Data entry was performed in the MS excel spreadsheet.

Table -1: Difference of mean (SD) among adolescent and adult mothers in study area

Indicators	All subjects X ± SD	age <= 19 Years X ±SD	>= 20 years X±SD	p-value
Gravida	1.6 ±0.75	1.3 ±0.46	1.8 ±0.81	0.000
Number of ANCs	3.58 ±7.66	2.89 ±1.09	3.98 ±9.60	0.001
IFA tables	93.03 ±46.95	90.97±45.34	94.26±47.89	0.616
Exclusive Breastfeeding	64.01± 67.17	57.87± 65.76	67.64±67.81	0.081
Immunization	2.51±8.60	2.16±6.34	2.72±9.69	0.075

Key: SD = Standard Deviation, X= mean value, gravida = number of pregnancies, ANC= Antenatal care (ANC) coverage is an indicator of access and use of health care during pregnancy,

IFA = iron and folic acid (IFA) supplementation to prevent maternal and newborn health outcomes, Exclusive Breastfeeding = WHO and UNICEF recommend that children initiate breastfeeding within the first hour of birth and be exclusively breastfed for the first 6 months of life – meaning no other foods or liquids are provided, including water, Immunization: A process by which a person becomes protected against a disease through vaccination (number 2 means full immunization).

Table =1: Background Characteristics of sample by Maternal Age (both adolescent & adult mothers)

Background Characteristics	<=19 Year(238)		>=20 Year(402)		p-value
	n	%	n	%	
Adolescent Husband Age	21	3.28	619	96.71	
Religion					
Hindu	156	65.55	245	60.95	0.000
Muslim	81	34.03	154	38.31	0.000
Christian	1	0.42	3	0.75	0.058
Caste					
SC	109	45.80	123	30.60	0.000
ST	22	9.24	46	11.44	0.000
OBC	35	14.71	65	16.17	0.000
Other	72	30.25	168	41.79	0.000
Education Level					
Illiterate	13	5.46	29	7.21	0.000
Read &Write	0	0.00	1	0.25	
1 – 4th Standard	15	6.30	31	7.71	0.000
5 – 8th Standard	64	26.89	81	20.15	0.000
9th - 12th Standard	144	60.50	217	53.98	0.000
College	2	0.84	43	10.70	0.000
Type of Toilet Used					
No toilet	150	63.03	176	43.78	0.000
Pit latrine	10	4.20	12	2.99	0.000
Sanitary latrine	78	32.77	214	53.23	0.000
Type of House					
Floor					
Pukka	77	32.35	186	46.27	0.000
Semi pukka	13	5.46	21	5.22	0.000
Mud	148	62.18	195	48.51	0.000
Wall					
Pukka	58	24.37	153	38.06	0.000
Semi pukka	32	13.45	52	12.94	0.000
Mud	148	62.18	197	49.00	0.000
Roof					
Pukka	36	15.13	114	28.36	0.000
Semi pukka	134	56.30	195	48.51	0.000

Mud	68	28.57	93	23.13	0.000
Outcome of Baby					
Livebirth	159	66.81	303	75.37	0.000
Low Birth Baby	59	24.79	70	17.41	0.000
Abortion	19	7.98	25	6.22	0.000
Stillbirth	1	0.42	4	1.00	0.016
Quintile					
Poor	44	18.49	53	13.18	0.000
Poor Middle	66	27.73	68	16.92	0.000
Middle	58	24.37	79	19.65	0.000
Upper Middle	44	18.49	111	27.61	0.000
Upper	26	10.92	91	22.64	0.000

Table-2 represents the effects of ANCs, religion, caste, education level, type of house, outcome of the baby and quintile among adolescent and adult mothers in study population. 63.03% adolescent mothers availed no toilet facility and only 32.77% use sanitary latrine. More than 50% adolescent mothers belong to Scheduled Caste and Scheduled Tribe population. Low birthweight babies (24.79% and abortion (7.98%) were comparatively higher among adolescent mothers than adult mothers (LBW: 17.41% and abortion: 6.22% in sample population and p- value significant. In most of the cases p-values are highly significant.

Table-3: Logistic regression analysis of factors associated with LBW infants in adolescent and adult pregnancies (N= 596)

Variable	Low Birthweight(N=134)		Normal Birthweight(N= 462)		Adjusted OR[1](95% CI)	p-value
	Number	%	Number	%		
Education Level						
Illiterate(Reference)	11	8.21	24	5.19		
Read & Write	0	0.00	1	0.22		
1 - 4 Standard	15	11.19	29	6.28	.862(.333 2.23)	0.762
5 - 8 Standard	28	20.90	102	22.08	1.627(.707 3.745)	0.252
9th- 12th Standard	75	55.97	263	56.93	1.56(.727 3.36)	0.252
College	4	2.99	38	8.23	4.24(1.20 14.91)	0.024
Don't know	1	0.75	5	1.08	2.25(.234 21.74)	0.48
Number of antenatal care visits						
<=3(Reference)	71	52.99	248	53.68		
>=4	63	47.01	214	46.32	.987(.662 1.472)	0.95
Number of IFA tablets						
<=99	65	48.51	159	34.42		
>=100	69	51.49	303	65.58	1.79(1.206 2.671)	0.004
Exclusive Breastfeeding						
<=179 (Reference)	113	84.33	399	86.36		
>=180	21	15.67	63	13.64	.854(.499 1.46)	0.567
Sanitation Facility						
No Toilet(Reference)	77	57.46	223	48.27		

Pit Latrine	3	2.24	15	3.25	1.79(.502 6.385)	0.368
Sanitary Latrine	54	40.30	224	48.48	1.43(.9647 2.128)	0.075
Quintile						
Poor(Reference)	32	23.88	54	11.69		
Poor Middle	32	23.88	93	20.13	1.68(.926 3.058)	0.088
Middle	27	20.15	103	22.29	2.24(1.215 4.135)	0.01
Upper Middle	26	19.40	118	25.54	2.66(1.43 4.925)	0.002
Upper	17	12.69	94	20.35	3.22(1.636 6.369)	0.001

Adjusted odd ratio[1] was calculated by multiple logistic regression analysis after adjusting for immunization, IFA tablets taken or not, blood pressure and weight measured or not

Adjusted for the confounding effects of immunization taken, Iron and folic tablets taken, blood pressure and weight measured or not before pregnancy period, literate participants with college were negligible (odds ratio 4.24; 95% confidence interval: 1.20 14.91), antenatal visits for 4 or more was 47.01 % for LBW and 46.32 % for normal birthweight babies (odds ratio.987, 95% confidence interval: .662 1.472) and p-value not significant. This is because of continuous monitoring of ASHA and Anganwadi workers at the rural level. Number of IFA tablets taken 100 or more was 51.49 % for mothers of LBW babies and 65.58 % for mothers of normal birth weight (odd ratio: 1.79, 95% confidence interval: 1.206 2.671) , use of sanitary latrine was 40.30% for LBW mothers and 48.48 % for normal birthweight mothers, (odd ratio: 1.43; 95% confidence interval: (.9647 2.128) , upper socioeconomic group (odd ratio: 3.22 ; 95% confidence interval: 1.636 6.369). P-value is significant for middle, upper middle and upper.

III. DISCUSSION

During nationwide lockdowns, child marriages became more common due to the absence or non-enforcement of child marriage laws. Child marriage became a plausible option for families when productive alternatives are not available for girls. Under this circumstance it is the fact that families prefer to marry off their daughters early to have their one mouth less to feed. The bridegroom parties sometimes demand fewer dowries when they saw the age of the bride is less.

In Pandemic, due to travel restrictions and social distancing, the pregnant mothers in many cases failed to attend clinic for regular checkups and less access to social and health care services resulting birth of low weight babies, increased cases of maternal and child mortality. In our study 37.19 % adolescence mothers were experiencing at least one pregnancy due to societal compulsion. Most of families belonged to poor or poor middle socioeconomic status in study area. More than 56 % adolescent mothers reported drop out after matriculation or higher secondary level.

In the study, the adolescent husband age was around 3%. This difference may be due to different study populations; our study population involved teenagers, while the study by Goisis, et al [2018] involved the general population. Problems may arise when there is an increased prevalence of adolescent husbands. Having a stable and adequate income is essential for a husband, as his main expenses will be food, clothing, housing, transport, maternal care, childcare, and health. Therefore, a teenage father with a low income who is married to a teenage wife might be unable to provide proper nutrition and adequate health care, leading to late and inadequate antenatal care and subsequently giving rise to poor perinatal outcomes, such as LBW [Chen XK et.al. 2008]. At COVID period, most of the population lost their jobs as they were working at seasonal category of employment and as a result income level reduced at a drastic level or they have no income. So low birth weight babies increased to 24.79 % for adolescent mothers.

IV. CONCLUSION

Being a teenager associated with adverse fetal outcome in the rural sample study population at COVID period, is mainly when teenagers experiment lower education and less access at health centres in rural areas. . In low resources setting, multidisciplinary approach including paternal unemployment and setting up favorable socio-economic environment are needed to prevent low birth weight babies and to improve maternal health.

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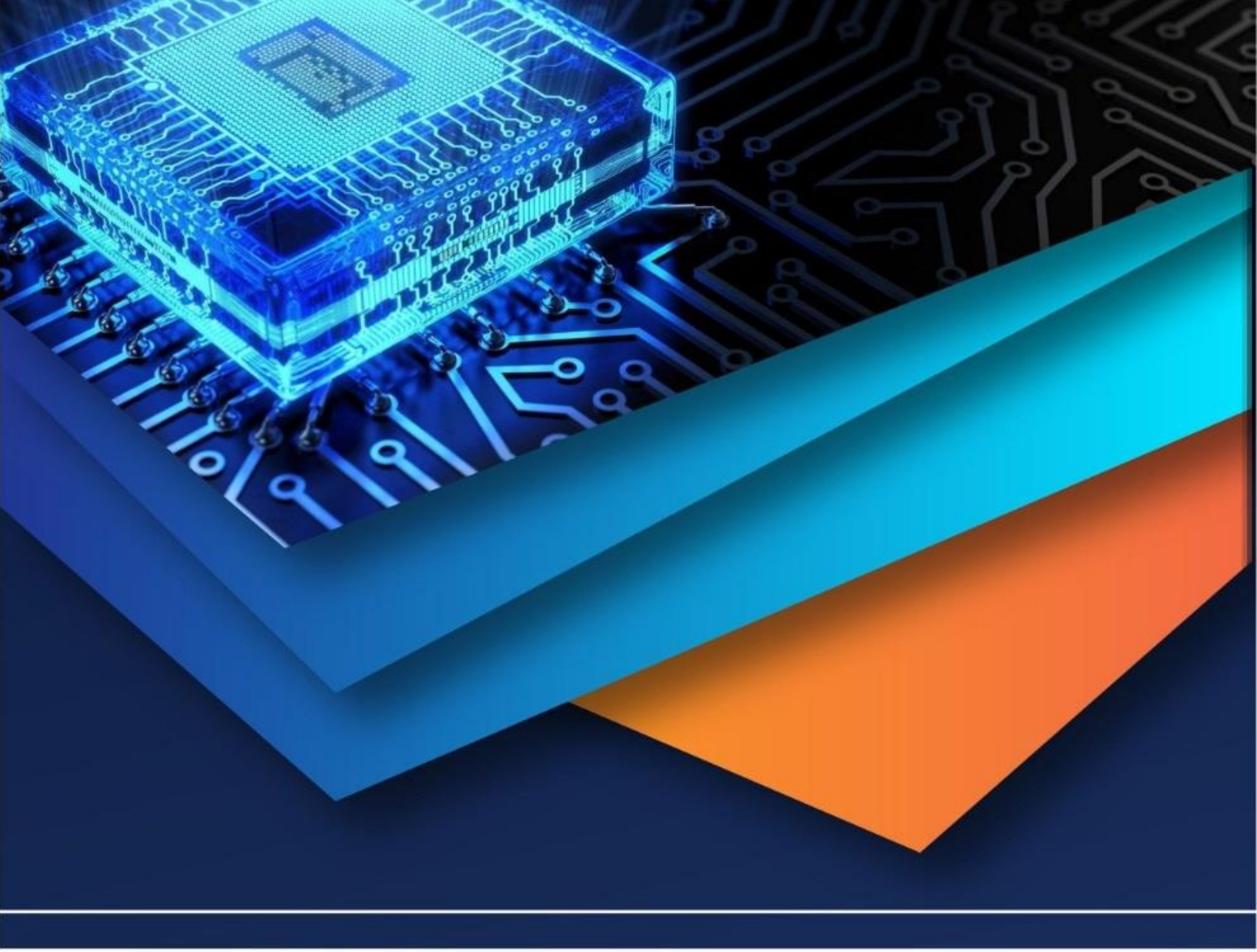

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