RESEARCH ARTICLE

Role of socioeconomic status on the prevalence of low-birth-weight babies in Allied Hospital Faisalabad

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Abstract

Objective: To assess the impact of socioeconomic status on the prevalence of low birth weight babies.

Method: The cross-sectional study was conducted at the Allied Hospital, Faisalabad, Pakistan, from March 28, 2022, to February 28, 2023, and comprised mothers with low birthweight infants (<2500g). Data included maternal age, residential status, educational status of the parents, prenatal care practices, maternal workload, infection incidence during pregnancy, relevant family history, maternal weight, income level, employment status, and drug usage. Data was analysed using SAS 9.4.

Results: Of the 120 mothers with mean age 30.5±6.1 years, 90(75%) were aged 18-40 years, 78(65%) resided in rural areas, and 82(68%) had lower educational levels. Moreover, 80(67%) mothers did not receive antenatal care, and 44(37%) reported infections during pregnancy. Family history of low birthweight babies was prevalent in 64(53.33%) cases. Maternal weight was normal in 78(65%) cases. The income level was less than Pak Rupee 10,000 in 88(73.33%) cases and there were 90(75%) non-working women. Overall, 81(67.5%) of the infants developed postnatal jaundice.

Conclusion: A complex interplay of socioeconomic factors, including maternal age, family income, occupation, area of residence, education level and antenatal care utilisation, was evident in relation to low birthweight.

Keywords: Low birth weight infants, Socioeconomic factors, Family income, Education, Antenatal care visits, Maternal health services. (JPMA 75: 1757; 2025) **DOI: https://doi.org/10.47391/JPMA.21313**

Introduction

Low birthweight (LBW) means birthweight <2,500g, and is usually assessed within the initial hour after birth irrespective of gestational age.[1] Clinical observation suggests that LBW children often exhibit lower-than-expected weight and height measurements even after adjusting for their gestational age.[1] Monitoring LBW is crucial as it serves as a global indicator of community health, and periodic assessments are necessary to evaluate the effectiveness of preventive healthcare services. LBW stands as the most significant predictor of infant mortality within the initial month following birth.[2] LBW infants face immediate risks, such as birth asphyxia, hypoglycaemia, hypocalcaemia, hypothermia, and increased susceptibility to infections. Over the long term, they may experience issues like failure to thrive, diabetes mellitus (DM), hypertension (HTN), and learning difficulties.[3] Later on, they may exhibit reduced intelligence quotient (IQ) scores and lower academic performance on standardised tests.[4]

Socioeconomic status (SES), including poverty, income and educational attainment, as well as violence during pregnancy, restricted access to prenatal care and early marriages, stand out as the predominant factors contributing to LBW infants.[5] Several socioeconomic factors also influence the nutritional status of the mothers. It has proven to be the most dependable predictor of developmental outcomes.[6,7] Premature birth (<37weeks gestation) and foetal growth restriction are also contributors to LBW.[8]

Moreover, occupational factors, such as stress, prolonged standing and exposure to chemical substances, can result in spontaneous abortion, premature delivery, LBW neonate, and abnormalities in infant development.[9] Furthermore, research has demonstrated the detrimental impact of work-related stress on foetal growth and development.[10]

LBW phenomenon is impacted by diverse factors, including maternal health conditions, like chronic diseases such as HTN, DM, and issues with heart, lung or kidney. Parity and birth-spacing are also identified as risk factors.[11] Additionally, factors like preterm labour, infections, smoking and alcohol consumption during pregnancy can contribute to LBW.[12]

LBW affects approximately 15% of births globally, with rates varying from 3.3% to 38%. It is most common in low- and middle-income countries (LMICs), accounting for over 20 million births annually.[13] In Pakistan, birthweight varies regionally, with higher rates of LBW in Balochistan (24.1%) and Gilgit-Baltistan (GB) (25.3%) compared to Punjab

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(18.5%), Sindh (19.3%) and Khyver Pakhtunkhwa (KP) (21%).[14] According to epidemiological studies, infants weighing <2500g face a 20% higher likelihood of mortality compared to their normal-weight counterparts.[15]

The argument has been made that addressing persistent disparities in LBW involves taking several measures. This entails redefining health to include social factors, expanding research beyond pregnancy outcomes to encompass women's overall health, addressing the connection between socioeconomic factors and health, and ensuring robust support for individuals and families, including financial stability and healthcare access.[16]

Lifestyle behaviours, like smoking, weight-gain in pregnancy and drug use, significantly affect foetal growth, influenced by various factors. Addressing these requires substantial societal changes, including prioritising preventive health and implementing family-centred workplace policies.[17]

The growth status and patterns of children constitute significant criteria for assessing their health and wellbeing. Analysing these growth patterns and identifying deviations is essential for detecting potential pathological conditions. Therefore, the growth and maturation of children serve as sensitive indicators of health, influenced by numerous factors.[18]

Over the past decade, various intervention programmes, such as Safe Motherhood and Reproductive Health, and The Infant Health and Development Programme, have been globally enacted to improve the welfare of both mothers and children.[19]

Initiatives targetting birthweight improvement by addressing socioeconomic disadvantages are under scrutiny. Historically and presently, most programmes target individual health implications of economic and social disadvantage. Cost-benefit and cost-effectiveness analyses help allocate limited resources efficiently among social goals.

The current study sought was planned to assess the impact of SES on the prevalence of LBW.

Subjects and Methods

The cross-sectional study was conducted at the Allied Hospital, Faisalabad, Pakistan, from March 28, 2022, to February 28, 2023. The sample was raised using non-probability sampling technique. The sample size was calculated using the Raosoft Sample Size Calculator (Raosoft Inc., Seattle, WA, USA),[20] with a 95% confidence level, 5% margin of error, and an expected prevalence of low birth weight (LBW) of 23%, based on data from the Pakistan Demographic and Health Survey 2017–18.[21] This ensured statistical significance and feasibility.

Mothers aged 18–60 years with LBW infants (<2500 g) were included, while unmarried women and those outside the age range were excluded. Data were collected using structured questionnaires completed individually by participants, while only those who were illiterate were interviewed after providing informed consent.

Data was analysed using SAS version 9.4. Descriptive statistics were used for demographic and clinical characteristics. Continuous variables were presented as mean±standard deviation. The association between SES factors and LBW was assessed using chi-square tests. P<0.05 was considered statistically significant.

Results

Of the 250 questionnaires distributed, 120(48%) were returned fully completed. Of these 120 mothers with mean age 30.5±6.1 years, 90(75%) were aged 18-40 years, 78(65%) resided in rural areas, and 82(68%) had lower educational levels, which had a significant influence as the p-value is 0.001, which is less than alpha 0.05. Moreover, 80(67%) mothers did not receive antenatal care (ANC) the p-value is 0.019 and 44(37%) reported infections during pregnancy. Family history of LBW babies was prevalent in 64(53.33%) cases. Maternal weight was normal in 78(65%) cases. The income level was less than Pak Rupee (PKR) 10,000 in 88(73.33%) cases, which showed a significant effect, with a p-value of less than 0.0001 and there were 90(75%) non-working women in the sample. Overall, 81(67.5%) of the infants developed postnatal jaundice (Table, Figures 1-4).

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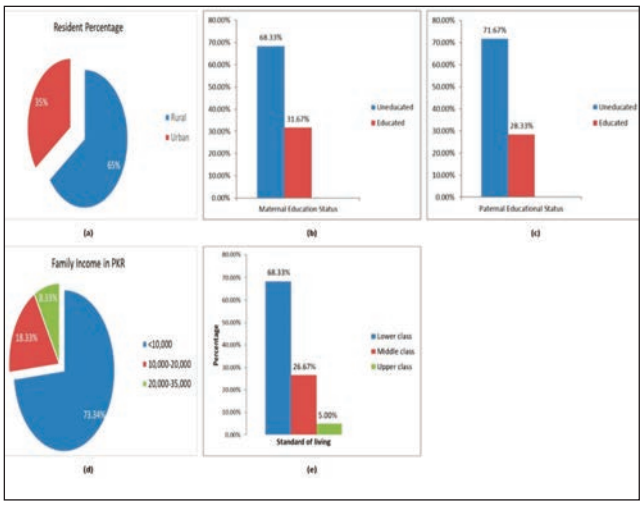

Figure-1: Socioeconomic status showing (a) data of residence. (b) maternal education, (c) paternal education, (d) family income in terms of Pak Rupee (PKR), and (e) standard of living.

Table: Socioeconomic characteristics.

Aspect	n (%)
Mothers' Mean Age (years)	30.5±6.1
- <18	19 (15.8)
- 18 to 40	90 (75.0)
- >40 years	11 (9.1)
Families' Residence	
- Rural areas	78 (65)
- Urban areas	42 (35)
Mothers' Education Level	
- Uneducated	82 (68.3)
- Educated	38 (31.6)
Fathers' Education Level	
- Uneducated	86 (71.6)
- Educated	34 (28.3)
Mothers Taking Supplements	
- Yes	42 (35)
- No	78 (65)
Maternal Workload During Pregnancy	
- Light	14 (11.6)
- Moderate	70 (58.3)
- Heavy	36 (30.0)
Mothers Carrying Heavy Objects	
- Yes	66 (55)
- No	54 (45)
Mothers Suffering from Infections	
- Yes	44 (36.6)
- No	76 (63.3)
Mothers' Antenatal Care Visits	
0-1 visits	80 (66.6)
2-4 visits	31 (25.8)
>4 visits	9 (7.5)
Families with a History of Previous LBW Babies	
- Yes	64 (53.3)
- No	56 (46.6)
Families' Socioeconomic Status	
- Low standard of living	82 (68.3)
- Middle class	32 (26.6)
- Upper class	6 (5)
Maternal Weight Status	
- Underweight	12 (10)
- Normal weight	78 (65)
- Overweight	30 (25)
Maternal Work Posture During Pregnancy	
- One-sided posture	54 (45)
- Not one-sided posture	66 (55)
Maternal Employment Status	
- Employed	30 (25)
- Unemployed	90 (75)
Family Income	
- < PKR.10000	88 (73.3)
- PKR.10000-20000	22 (18.3)
- PKR.20000-35000	10 (8.3)
Mothers Taking Drugs/Medicines for Systemic Illness	
- Yes	18 (15)
- No	102 (85)
Newborns with Jaundice	
- Yes	81 (67.5)
- No	39 (32.5)

LBW: Low birthweight, PKR: Pak rupee.

Figure-2: Maternal health spectrum showing (a) the maternal age group, (b) families with a history of previous low-birthweight (LBW) babies, (c) mothers suffering from infections during pregnancy, (d) mothers taking drugs/medicine for any systemic diseases, and (e) the presence of jaundice in newborn babies.

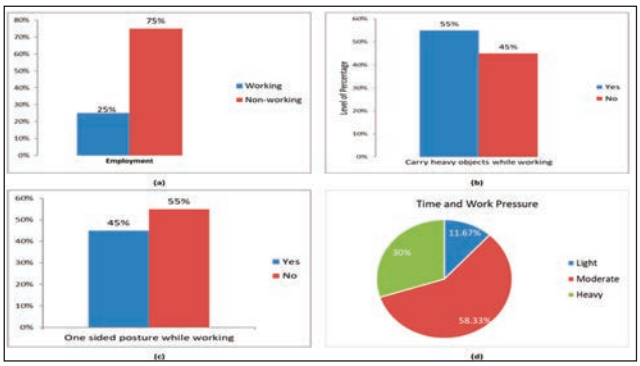

Figure-3: Mother's working status during pregnancy showing (a) employment status, (b) carrying heavy objects while working, (c) working posture, and (d) mothers' time and work pressures during pregnancy.

Discussion

The current study aimed at examining the factors contributing to LBW prevalence, focussing on maternal age, education, SES, health behaviours, and ANC.

Maternal age, typically linked with LBW in other studies, showed no significant association in the current cohort (p=0.265). Advanced maternal age can lead to decreased foetal growth and increased LBW risk[16] due to biological aging, but the current findings suggest that other factors may have a more significant impact. Other studies have reported varied results, indicating that age alone might not be the most significant predictor of LBW.[22]

SES factors, such as rural residency, lower education levels, and low family income, were associated with higher LBW

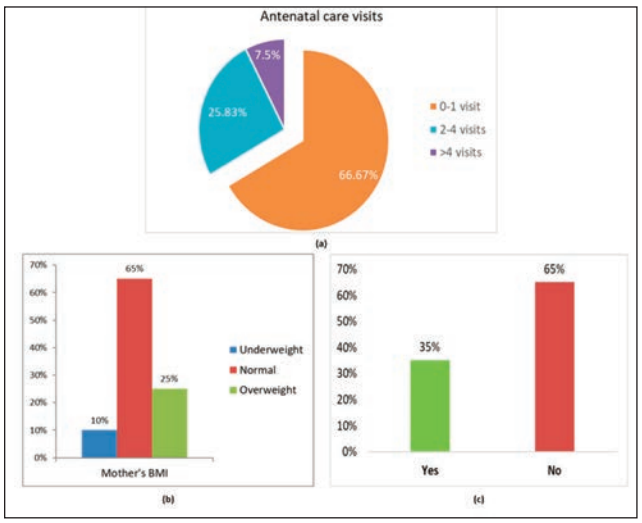

Figure-4: Mother's working status during pregnancy showing (a) employment status, (b) carrying heavy objects while working, (c) working posture, and (d) mothers' time and work pressures during pregnancy.

rates (p=0.001) in the current study. Low SES is frequently linked to inadequate healthcare access, poor nutrition and environmental risks that contribute to LBW.[2,14] The current findings support the protective role of maternal education, with uneducated mothers facing greater risks of LBW, which is often due to inadequate prenatal care and unhealthy behaviors.[14]

In terms of maternal health, the lack of supplement intake during pregnancy was a key concern, which supports earlier findings.[22] Improving nutrition and supplement use among pregnant women could reduce LBW prevalence and improve foetal health.

Work-related stress and physical strain were also evaluated. While most mothers in the current study were not employed, a portion of those who worked experienced physical strain, such as lifting heavy objects and working in one-sided postures. Although no direct correlation was found between maternal employment and LBW, studies have consistently linked work stress and physical strain to increased LBW risks, suggesting that work-related factors could influence birth outcomes.[23]

ANC was identified as a critical factor in reducing LBW rates in the current study, supporting previous studies that emphasised the importance of regular prenatal monitoring to detect and manage potential complications that can lead to LBW.[24] Improving access to ANC, particularly in rural and low-income populations, is crucial to reducing LBW prevalence.

A family history of LBW was found to increase the likelihood of subsequent LBW pregnancie, which was in line with earlier research suggesting a genetic or familial predisposition to LBW.[25] Families with a history of LBW infants should be monitored closely to mitigate risks in future pregnancies.

Maternal weight was another factor explored in relation to LBW in the current study. While maternal overweight is typically linked to complications, such as macrosomia and preterm birth, the current study did not find a significant association (p=0.596) between maternal obesity and LBW. However, maternal underweight status was associated with an increased risk of LBW, which aligned with existing literature on the effects of undernutrition during pregnancy on foetal growth.[26]

Roughly one-third of LBW cases have been linked to infections.[24] Factors linked to drug use explained the majority, ranging from 70% to 90% of LBW cases, and heightened the odds of LBW associated with drugs. Substantial proportions of the effects on birthweight due to cocaine use were attributed to substance abuse, psychosocial factors, and behavioural aspects.[27]

Jaundice in LBW newborns was also noted in the current study, which is consistent with previous studies showing that LBW and premature infants are more prone to jaundice.[16] This further emphasises the vulnerability of LBW infants to additional health complications, and highlights the importance of managing LBW risks.

The current study has limitations as the sample size was not statistically calculated. Larger, community-based studies are needed to validate the current findings, and to further guide interventions aimed at reducing LBW and improving maternal and neonatal health.

Conclusion

Various SES factors had an impact on LBW status, including maternal workload, heavy lifting during pregnancy, and parental education. Beyond access to antenatal care, education and awareness are essential for utilising available resources effectively. Reducing physical strain and improving parental knowledge could play a key role in lowering LBW prevalence.

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Author Contribution:
AI & AA: Literature research, concept, design, data analysis, interpretation, figures illustration, writing, referencing and proof reading.
AW: Concept, design, data collection, writing, referencing and proof reading.
AP: Concept, design, writing, referencing and proof reading.