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Promoting Healthy Futures: Measuring the Impact of Maternal Factors on Low Birth Weight in Rural Tribal Areas of Gujarat

Vishwakarma D[1]*, Aravind AJ[1], Patel R[2], Deshmukh A[2], Thakre A[2] and Raut S[2]

[1]Assistant Professor, PP Savani University Surat, India
[2]MPH Scholar, PP Savani University Surat, India

***Corresponding author:** Deepak Vishwakarma, Assistant Professor, HOD, Department of Public Health, PP Savani University NAAC Coordinator, PP Savani University Surat, Gujarat 395007, India, Email: deepak.vishwakarma@ppsu.ac.in

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Abstract

Background: Since many newborns born in India are low birth weight (LBW), LBW is a significant global public health concern. LBW is a critical measure of mother and child health since it influences newborn mortality and has long-term health implications.
Methodology: This cross-sectional study looked at maternal characteristics in rural tribal Gujarat that affect LBW newborns. The study focused on women who gave birth in two districts of Gujarat between January 2021 and June 2023 and were between the ages of 18 and 35. A straightforward random selection technique was used to choose 414 participants. Through house-to-house surveys, information on sociodemographic traits, prenatal care, mother lifestyle, and nutritional status was gathered using a structured questionnaire. The SPSS Software Trial version was used to perform chi-square tests and descriptive statistics for the bivariate study.
Results: In the research area, LBW prevalence was 25.4%. Illiteracy (13.3%, P<0.047), low socioeconomic status (61.9%, P<0.012), insufficient prenatal care visits (16.2%, P<0.000), the absence of tetanus toxoid injections (12.4%, P<0.000), the lack of health education or counselling (11.4%, P<0.000), and lower intake of supplemental food (12.4%, P<0.000) were among the factors significantly linked to LBW. Higher rates of LBW were also associated with maternal alcohol intake (1.9%, P<0.015), low BMI (18.1%, P<0.003), inadequate iron-folic acid supplementation (12.4%, P<0.001), and infrequent consumption of fruits, vegetables (19.0%, P<0.006), pulses (7.6%, P<0.037), and other vegetables.
Conclusion: LBW are greatly impacted by low maternal literacy, low socioeconomic position, restricted access to healthcare, and inadequate nutrition. The results highlight the need for focused actions to improve birth outcomes in these underprivileged areas. These interventions should include educational initiatives, financial aid, better prenatal care, and improved dietary practices.

Keywords: Low Birth Weight; Maternal Factors; Rural Tribal Areas; Gujarat; India; Neonatal Mortality; Socioeconomic Status; Prenatal Care; Maternal Health Behaviors

Abbreviations

LBW: Low Birth Weight; WHO: World Health Organization; NFHS: National Family Health Survey; TT: Tetanus Toxoid; BMI: Body Mass Index.

Introduction

Background

Low birth weight (LBW) is a major global public health concern that affects the health of mothers and children

in both developed and developing countries. It is a crucial factor in determining whether a kid survives, as new borns born underweight (LBW) have a neonatal death rate that is almost 20 times higher than that of infants born at normal weight [1]. Maternal health is a critical factor in neonatal outcomes since a mother has to have a healthy pregnancy in order to give birth to a healthy child [2]. A birth weight of less than 2500 grams (5.5 pounds) is considered low birth weight (LBW) by the World Health Organization (WHO) [3]. LBW is a significant public health issue in many poor nations and is an important predictor of a newborn's future development, health, and chances of survival. It also influences the newborn's susceptibility to infections [4].

An estimated 8 million of the expected 19.8 million low birth weight babies born globally in 2020-or 14.7% of all births-were born in India. These babies are more likely to die in the first month of their lives, and they also have longer-term effects like stunted growth, lowered IQs, and a higher chance of developing chronic illnesses like diabetes and obesity [5]. A 2020 UNICEF report states that 27.4% of babies in India were born with low birth weights, which means that these babies had a 40-fold higher chance of dying in the first four weeks of life than babies with normal weights [6]. Compared to many other countries, 18.2% of babies in India were underweight at birth, according to the National Family Health Survey (NFHS-5) 2019–21 fifth wave. In Gujarat, 18.5% [7].

Numerous LBW risk factors have been identified by research, including socioeconomic, dietary, demographic, and prenatal care usage factors [8]. The following factors have a substantial impact on LBW rates [9,10]: maternal age [11-13], health and nutrition [14,15], physical activity, prenatal visits [16,17], maternal education, and household income[18-21].

In order to meet Sustainable Development Goal 3.2, which calls for bringing newborn death down to 12 per 1,000 live births by 2030, it is imperative that LBW be addressed [22]. By 2025, the National Health Policy of India aims to lower newborn death to 16 and stillbirth rates to single digits. Achieving these objectives and ensuring safe pregnancies depend on providing moms with proper prenatal care, nutrition, rest, and a clean environment [23].

Need of the study

Given the high prevalence of low birth weight (25.4%) in this population, this study on maternal factors influencing low birth weight in rural tribal South Gujarat is extremely important. By addressing the unique healthcare and socioeconomic issues this community faces, it closes a large knowledge gap [24]. By identifying these maternal characteristics, policymakers and interventionists can better support the health of both mothers and their infants. In the end, this study greatly improves mother and child health in tribal South Gujarat by arming families and women with critical knowledge for improved prenatal care [25].

Aim

The aim of this study is quantifying maternal factors' contribution to low birth weight in rural tribal setting, Gujarat, with the goal of improving outcomes for mother and newborns in this area.

Objectives

- To assess the prevalence of low birth weight among newborns in rural tribal setting of Gujarat.
- To identify the socio-demographic characteristics of mothers linked to an increased risk of low birth weight.
- To examine the utilization of prenatal care services by mothers and its connection to low birth weight.
- To investigate the impact of maternal lifestyle, such as use of tobacco smoking/chewing and alcohol consumption on low birth weight.
- To assess the maternal nutritional status, dietary intake and its association with low birth weight.

Literature Review

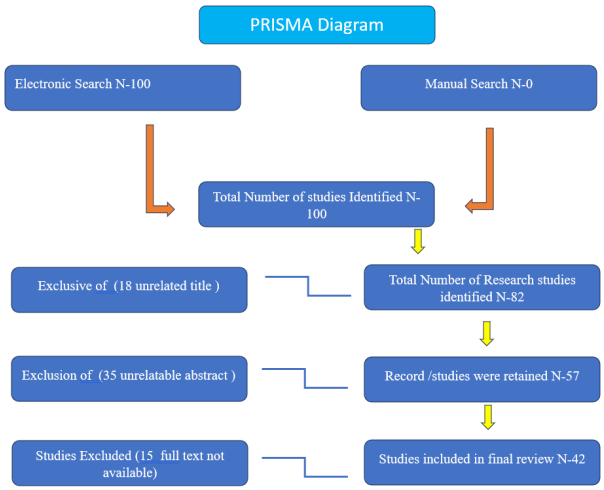

Figure 1: PRISMA diagram.

In the PRISMA diagram, we thoroughly documented our research method, focusing on both electronic and manual searches to ensure a thorough literature evaluation. In the electronic research area, we first discovered 100 relevant studies. However, in the manual research category, we found no papers that fulfilled our requirements, resulting in a total of n = 0.

We began the review process with a total of 100 studies. We excluded 18 papers that were unrelated to our research aims after a thorough assessment. In addition, we removed 25 articles since their abstracts did not correspond with the subject of our study.

As a result of the lack of full-text publications, we encountered an additional layer of exclusion. During this round, 15 articles were eliminated from consideration. After applying these strong selection criteria and exclusions, we were left with a final count of 42 publications that were regarded reliable and relevant to our study. These 42 publications served as the foundation for our literature analysis, providing us with a strong and concentrated body of information to assist our investigation into maternal factors influences low birth weight among tribal women in two Districts, Gujarat (Figure 1).

Important findings of literature review

The thorough literature review on maternal factors influences low birth weight yield profound insights into this complex societal issue exploring five subtopics: Importance of maternal health, Maternal factors, consequences, prevalence and health impacts.

Methodology

Study Method

In order to provide statistically meaningful results, this study used a quantitative strategy that involved the methodical gathering and analysis of numerical data. This approach was selected because it can efficiently handle observable factors and yield exact, quantitative data.

Study Design

In rural tribal Gujarat, a cross-sectional research design was employed to investigate the influence of several maternal variables on the incidence of low birth weight (LBW) infants. This strategy makes data collection at a single point in time possible, which enables a thorough examination of various elements and their possible connections to LBW.

Study Setting

The community-based research project "Nurturing Healthy Futures" was carried out in Gujarat's rural tribal regions, namely in two districts. These areas were chosen because they have sizable indigenous populations and restricted access to healthcare facilities. The main goal was to comprehend the ways in which maternal factors affect LBW in these regions, taking into account the particular difficulties and traits of rural tribal people.

Study Population

Women between the ages of 18 and 35 who gave birth to at least one child in Gujarat's rural tribal community more precisely, two district between December 31, 2020, and June 30, 2023, were included in the study. It was important to include indigenous women in order to obtain their distinct viewpoints on the maternal variables affecting LBW in a group that is marginalized.

Qualifications for Inclusion

Women between the ages of 18 and 35 who gave birth to at least one child in Gujarat's rural tribal group between December 31, 2020, and June 30, 2023. ladies open to taking part in the research.

Criteria for Exclusion

Women who are not in the remote tribal community of Gujarat, who are not between the ages of 18 and 35, or who had children born before December 31, 2020, or after June 30, 2023.

Sample size

With a population size of 818,588 and an expected frequency percentage of 50% (assuming 50% prevalence), a confidence level of 5%, and a design effect of one (simple random sampling), the sample size was calculated using the OpenEpi tool. These factors along with the fact that LBW are common in Gujarat led to the conclusion that a sample size of 384 eligible women was adequate. Nevertheless, 414 participants in total-after allowing for an 8% non-response rate-were included in the study.

Sampling technique

A simple random selection procedure was used to obtain a sample of 414 individuals. In the beginning, 207 volunteers were chosen by purposeful sampling from each of Gujarat's two rural tribal districts. Two talukas, each with 104 participants, were selected by the fishbowl method of simple random sampling.

Data collection Tool

The primary tool for data collection will be a structured questionnaire designed specifically for this isolated tribal area in India. It is divided into four sections: Section C deals with maternal lifestyle (tobacco and alcohol use), Section D assesses maternal nutritional status (height, weight, IFA consumption, hemoglobin levels, and dietary habits during pregnancy), and Section B gathers data on prenatal care utilization (ANC visits, timing, TT injections, consultations, and supplemental food consumption from Aanganwadi

centers). Sociodemographic factors (age, education, occupation, income, birth order, interval between births, and weight of the last kid) are covered in Section A.

Data Analysis

The SPSS Software Trial version was used to analyze the quantitative data. The process of grouping variables according to data type entailed first uploading the data into SPSS from Google Sheets. The data were examined for normalcy once outliers and missing values had been removed. Descriptive statistics were used to summarize the results of birth weight and the mother's characteristics. Chi-square testing was employed to examine the associations between maternal factors and low birth weight.

Results

A cross-sectional survey was conducted in India's Gujarat State with 414 participants from two districts. The study aimed to quantify maternal factors' contribution to low birth weight in rural tribal setting, Gujarat, with the goal of improving outcomes for mother and newborns in this area.

Variable	Frequency	Percent
Birth weight		
<2.5	105	25.4
≥2.5	309	74.6
Total	414	100

Table 1: Prevalence of low birth weight.

A thorough overview of the birth weight distribution among the study population is given in the table. Approximately 25.4% of the 414 newborns who were assessed had low birth weights, which are defined as weighing less than 2.5 kg. This threshold is important since it is often linked to increased vulnerability to a variety of health problems. In contrast, 74.6% of the sample, or the large majority of the newborns, were delivered weighing 2.5 kg or more. The distribution of birth weights is uneven, which highlights how important it is to have careful observation during pregnancy and childbirth. It is essential to identify low birth weight babies as soon as possible in order to provide the right treatments and medical attention and lower the health risks connected to this issue (Table 1).

Variable	Birth weight (in KG)		Chi- square value	P-value	Cramer's V
	<2.5 (n=105) N (%)	≥2.5 (n=309) N (%)			
Education					
Illiterate	14 (13.3)	17 (5.5)	11.22	0.047*	0.165*
Primary school certificate	35 (33.3)	109 (35.3)			
Middle school certificate	44 (41.9)	118 (38.2)			
High school certificate	10 (9.5)	48 (15.5)			
Intermediate or diploma	0 (0.0)	3 (1.0)			
Graduate	2 (1.9)	14 (4.5)			
Occupation					
Homemaker	54 (51.4)	179 (57.9)	3.972	0.41	0.098
Elementary occupation	23 (21.9)	73 (23.6)			
Skilled agricultural and fishery worker	26 (24.8)	53 (17.2)			
Skilled worker and shop & Market sales worker	2 (1.9)	3 (1.0)			
Professional	0 (0.0)	1 (0.3)			
Income(Monthly-Rupees)					
≤6323	65 (61.9)	145 (46.9)	14.643	0.012*	0.188*
6,327 -18,949	31 (29.5)	136 (44.0)			
18,953-31,589	5 (4.8)	24 (7.8)			
31,591-47,262	0 (0.0)	2 (0.6)			
47,266-63,178	2 (1.9)	1 (0.3)			
≥1,26,360	2 (1.9)	1 (0.3)			
Socio-economic scale - Kuppuswamy					

Upper	0 (0)	1 (0.3)	6.421	0.17	0.125
Upper Middle	2 (1.9)	0 (0.0)			
Lower Middle	4 (3.8)	10 (3.2)			
Upper Lower	82 (78.1)	243 (78.6)			
Lower	17(16.2)	55 (17.8)			
Age					
18-23	56 (53.3)	156 (50.5)	0.277	0.871	0.026
24-29	35 (33.3)	111 (35.9)			
30-35	14 (13.3)	42 (13.6)			
Mamta card					
Yes	91 (86.7)	295 (95.5)	9.63	0.002*	0.153*
No	14 (13.3)	14 (4.5)			
Birth Interval					
First time	31 (29.5)	118 (38.2)	6.867	0.076	0.129
1-2 years	49 (46.7)	107 (34.6)			
2-3 years	5 (4.8)	8 (2.6)			
3 and above years	20 (19.0)	76 (24.6)			
Birth Order					
More than four	2 (1.9)	0 (0.0)	8.093	0.088	0.14
Four	4 (3.8)	5 (1.6)			
Three	13(12.4)	41 (13.3)			
Two	43 (41.0)	122 (39.5)			
One	43 (41.0)	141 (45.6)			

Table 2: Association between Low Birth Weight and Socio-Demographic Characteristics.

A contingency analysis of birth weight, broken down into ranges of 2.5 kg and 2.5 kg, is shown in the above table along with a number of socio-demographic variables. To determine if these characteristics were connected, chi-square tests were employed. The mother's educational attainment has a significant impact on birth weight; low birth weight infants are more likely to be born to mothers with lower educational attainment. This relationship is strong, as evidenced by the low p-value of 0.047, Cramer's V representing 0.165 values, and a chi-square value of 11.220, suggesting that education influences LBW outcomes. Specifically, out of the total illiterate moms, only 17 (5.5%) gave birth to newborns weighing 2.5 kg or more; in contrast, 14 (13.3%) gave birth to kids with low birth weights (Table 2).

The incidence of LBW, on the other hand, does not seem to be significantly impacted by maternal occupation, as indicated by a weak correlation and a relatively low Cramer's V (V = 0.098) and non-significant Chi-square value 3.972, p = 0.41. Socioeconomic status and LBW newborns do not statistically significantly correlate (p = 0.170). The weak connection is indicated by Cramer's V (V = 0.125). The incidence of LBW newborns did not seem to be correlated with the mothers' age (Chi square = 0.277, p = 0.871). According to Cramer's V (V = 0.026), the effect size seems to be rather tiny.

With a low p-value of 0.012, Cramer's V represents 0.188 value, indicating a strong association and a chi-square value of 14.643, it is noteworthy that a higher proportion of infants born under 2.5 kg was associated with lower monthly income. This is supported by the fact that 145 (46.9%) of mothers whose infants weighed 2.5 kg or more were among the 65 (61.9%) mothers whose monthly income was less than 6323 rupees.

Additionally, a lower percentage of LBW infants are associated with the Mamta card, a government initiative for maternal and child health, suggesting that it has a positive effect on birth weight outcomes. On the other hand, owning a Mamta card indicates a moderate link with a chi-square value of 9.630 and a low p-value of 0.002, indicating a statistically significant correlation. Cramer's V represents 0.153 values in this regard. There is no statistically significant correlation (p = 0.076) between the time between births and LBW newborns. The low effect size is indicated by Cramer's V (V = 0.129). There is no statistically significant correlation (Chi

square = 8.093, p = 0.088) between birth order and LBW babies. V = 0.140, Cramer's V, shows a shaky relationship.

In summary, the research revealed that the prevalence of LBW newborns in this rural tribal context in Gujarat is correlated with parameters such as income, education, and possessing a Mamta card. In this group of individuals, other variables such as age, birth spacing, birth order, occupation, and socioeconomic position do not seem to have a strong association with LBW newborns, providing insight into potential options for focused treatments and support.

Variable	Birth weight (in KG)		Chi- square value	P-value	Cramer 's V
	<2.5 (n=105) N (%)	≥2.5 (n=309) N (%)			
Initiation month of Prenatal care					
Didn't receive prenatal care	3 (2.9)	3 (1.0)	2.327	0.507	0.075
Fourth month or later	0 (0.0)	1 (0.3)			
Third month	8 (7.6)	22 (7.1)			
Second month	94 (89.5)	283 (91.6)			
ANC Visits					
No visit	9 (8.6)	3 (1.0)	23.222	0.000*	0.237*
1-3 visits	17 (16.2)	25 (8.1)			
4-6 visits	44 (41.9)	146 (47.2)			
7 or more visits	35 (33.3)	135 (43.7)			
Tetanus Toxoid (TT) injection					
No	13 (12.4)	3 (1.0)	27.461	0.000*	0.258*
Yes	92 (87.6)	306 (99.0)			
Health education or Counselling					
No	12 (11.4)	3 (1.0)	24.545	0.000*	0.243*
Yes	93 (88.6)	306 (99.0)			
Take-home ration (supplementary food)					
No	13 (12.4)	3 (1.0)	27.461	0.000*	0.258*
Yes	92 (87.6)	306 (99.0)			
Quantity of take-home ration (supplementary food)					
None of it	0 (0.0)	3 (1.0)	2.73	0.435	0.083
Very little of it	14 (13.3)	34 (11.0)			
About half of it	45 (42.9)	140 (45.3)			
Almost all of it	33 (31.4)	129 (41.7)			

Table 3: Association between Low Birth Weight and Prenatal Care Utilization of Mother.

A contingency analysis of birth weight (split into 2.5 kg and 2.5 kg ranges) and different prenatal care use characteristics are shown in the table. The initiation month of prenatal care shows that the majority of mothers with infants weighing <2.5 kg initiated care in second month 94 (89.5%) compared to those with infants ≥2.5kg were 283 (91.6%). 3 (2.9%) of women under 2.5 kg and 3 (1.0%) of women over 2.5 kg in both categories did not receive prenatal care, respectively. With a chi-square value of 2.327 and a p-value of 0.507, it can be concluded that there is no connection between an initiation month of prenatal care and low birth weight (Table 3).

A contingency analysis of birth weight (split into 2.5 kg and 2.5 kg ranges) and different prenatal care use characteristics are shown in the table. The initiation month of prenatal care shows that the majority of mothers with infants weighing <2.5 kg initiated care in second month 94 (89.5%) compared to those with infants ≥2.5kg were 283 (91.6%). 3 (2.9%) of women under 2.5 kg and 3 (1.0%) of women over 2.5 kg in both categories did not receive prenatal care, respectively. With a chi-square value of 2.327 and a p-value of 0.507, it can be concluded that there is no connection between an initiation month of prenatal care and low birth weight.

The administration of take-home rations (more food), health education or counseling, and the Tetanus Toxoid (TT) injection all showed comparable statistically significant correlations. A strong correlation was shown in every case by high chi-square values and extremely low p-values (all 0.000) with Cramer's V, indicating that moms who did not receive these therapies were more likely to give birth to low-birth-weight babies. Low birth weight and the amount of take-home ration do not statistically significantly correlate (p = 0.435). There is a very weak correlation, as indicated by the Cramer's V effect size of 0.083.

In conclusion, the findings show a high correlation between birth weight and ANC visits, TT injections, health education/counselling, and the supply of take-home food. Babies weighing less than 2.5 kg at delivery were much more likely to be born to mothers who did not receive these components of prenatal care. The amount of take-home ration and the first month of prenatal care, however, showed no significant correlation or a weak one with low birth weight.

Variable	Birth weight (in KG)		Chi- square value	P-value	Cramer' s V
	<2.5 (n=105) N (%)	≥2.5 (n=309) N (%)			
Smoking					
No	104 (99.0)	305 (98.7)	0.077	0.782	0.014
Yes	1 (1.0)	4 (1.3)			
Tobacco chewing					
No	99 (94.3)	301 (97.4)	2.343	0.126	0.075
Yes	6 (5.7)	8 (2.6)			
Alcohol consumption					
No	103 (98.1)	309 (100.0)	5.914	0.015*	0.120*
Yes	2 (1.9)	0 (0.0)			

Table 4: Association between Low Birth Weight and Maternal Lifestyle.

Data on the correlation between maternal lifestyle characteristics (alcohol use, smoking, and chewing tobacco) and the 2.5 kg and 2.5 kg birth weight ranges are shown in this table. There is no apparent correlation between smoking and low birth weight, as evidenced by the table, which shows that 304 (98.7%) of women with infants ≥2.5 kg and 104 (99.0%) of women with neonates <2.5 kg did not smoke. The low chi-square value of 0.077 and the non-significant p-value of 0.782 reflect these findings. There was no significant correlation found between chewing tobacco and low birth weight, as evidenced by the chi-square value of 2.343 and p-value of 0.126 for 99 (94.3%) of the <2.5 kg group and 301 (97.4%) of the ≥2.5 kg group who did not chew tobacco (Table 4).

There is a substantial association between alcohol consumption and low birth weight. Of the women whose babies weighed less than 2.5 kg, 2 (1.9%) admitted to using alcohol; however, none of the mothers whose babies weighed more than 2.5 kg disclosed. Consequently, the chi-square value was 5.914, the p-value was low at 0.015, and Cramer's V represented 0.120 values, showing a moderate connection that suggests a noteworthy correlation between alcohol intake and low birth weight.

Variable	Birth weight (in KG)		Chi- square value	P-value	Cramer 's V
	<2.5(n=105) N (%)	≥2.5(n=309) N (%)			
Body Mass Index (BMI)					
<18.5	19 (18.1)	24 (7.8)	11.525	0.003*	0.167*
18.5-24.9	78 (74.3)	238 (77.0)			
≥25	8 (7.6)	47 (15.2)			
Iron and folic acid (IFA) supplements					
No	7 (6.7)	4 (1.3)	13.628	0.001*	0.181*
Occasionally	13 (12.4)	19 (6.1)			
Yes	85 (81.0)	286 (92.6)			
Quantity of IFA supplements					

Less than 3 tablets per week	21 (20.0)	27 (8.7)	11.406	0.010*	0.166*
3-4 tablets per week	34 (32.4)	113 (36.6)			
5-6 tablets per week	30 (28.6)	83 (26.9)			
7 or more tablets per week	20 (19.0)	86 (27.8)			
Haemoglobin level					
Not known	12 (11.4)	18 (5.8)	8.301	0.081	0.142
Less than 7.0mg/dL	1 (1.0)	0 (0.0)			
7.0-8.9mg/dL	9 (8.6)	20 (6.5)			
9.0-10.9mg/dL	71 (67.6)	220 (71.2)			
11.0-12.9mg/dL	12 (11.4)	51 (16.5)			
Meals or snacks					
1-2 times per day	59 (56.2)	138 (44.7)	4.742	0.093	0.107
3-4 times per day	39 (37.1)	136 (44.0)			
More than 4 times per day	7 (6.7)	35 (11.3)			
Pulses					
Rarely	8 (7.6)	9 (2.9)	8.495	0.037*	0.143*
2-3 times a week	25 (23.8)	66 (21.4)			
4-5 times a week	41 (39.0)	103 (33.3)			
Daily	31 (29.5)	131 (42.4)			
Non-vegetarian food					
Never	25 (23.8)	82 (26.5)	5.165	0.271	0.112
Rarely	25 (23.8)	60 (19.4)			
2-3 times a week	48 (45.7)	137 (44.3)			
4-5 times a week	0 (0.0)	12 (3.9)			
Daily	7 (6.7)	18 (5.8)			
Vegetables and fruits					
Never	5 (4.8)	3 (1.0)	14.285	0.006*	0.186*
Rarely	20 (19.0)	36 (11.7)			
2-3 times a week	32 (30.5)	77 (24.9)			
4-5 times a week	19 (18.1)	64 (20.7)			
Daily	29 (27.6)	129 (41.7)			
Dairy products					
Never	19 (18.1)	45 (14.6)	5.001	0.287	0.11
Rarely	18 (17.1)	36 (11.7)			
2-3 times a week	28 (26.7)	77 (24.9)			
4-5 times a week	5 (4.8)	13 (4.2)			
Daily	35 (33.3)	138 (44.7)			

Table 5: Association between Low Birth Weight and Maternal Nutritional Status.

Data on the main correlations between the mother's nutritional status and the various birth weight categories are shown in the table. A noteworthy correlation was found between low birth weight and low BMI, with a chi-square value of 11.525, p value of 0.003, and Cramer's V representing 0.167 values. This indicates a strong association, with 19 (18.1%) of mothers whose infants weighed less than 2.5 kg having a BMI below 18.5, compared to 24 (7.8%) of mothers whose infants weighed more than 2.5 kg. IFA supplement use was reported by 286 (92.6%) mothers of newborns ≥

2.5 kg and by 85 (81.0%) mothers of children under 2.5 kg, indicating a substantial association between low birth weight and not using IFA supplements (chi-square value: 13.628, p value: 0.001 (Table 5).

Low birth weight and insufficient IFA supplementation were significantly correlated, with a chi-square value of 11.406, p value of 0.010, and Cramer's V representing 0.166 values, indicating a strong association. Of the mothers in the group of women weighing less than 2.5 kg, 21 (20.0%) took fewer than three tablets per week, whereas 27 (8.7%) of mothers in the group of women weighing more than 2.5 kg did the same.

Although hemoglobin levels were mostly within the 9.0–10.9 mg/dL range for both groups, there was no significant correlation seen between hemoglobin levels and low birth weight. There was a slight difference in the frequency of meals; 59 (56.2%) of mothers whose babies weighed less than 2.5 kg had meals or snacks once or twice a day, while 138 (44.7%) did not.

However, there was no statistical significance for this gap. Eating pulses regularly was associated with a significant decrease in birth weight, with a potential significance of P value 0.037, Cramer's V representing 0.143 values, showing a considerable link, and a chi-square value of 8.495. Non-regular fruit and vegetable consumption reveals 20(19.0%) mothers with low birth weight babies, and (p=0.006), Cramer's V indicates 0.186 values which show a strong association. These results showed that moms of babies under 2.5 kg were more likely than mothers of babies 2.5 kg or more to have lower BMIs, take fewer and/or smaller amounts of IFA supplements, eat less pulses, and eat fewer fruits and vegetables. In terms of their association to birth weight, dairy products and non-vegetarian cuisine did not differ significantly from other dietary practices. This highlights the complex interactions between many nutritional components that influence the final birth weight.

Discussion

Low birth weight (LBW) is a major global public health concern since it is a major predictor of infant morbidity and mortality. This complex issue is influenced by a wide range of factors, including socioeconomic status, lifestyle, healthcare access, nutrition, and mother health. LBW is particularly prevalent in low- and middle-income countries like India, with rural tribal areas in two districts of Gujarat facing unique challenges.

Maternal health is crucial to ending LBW. It is essential to have excellent prenatal care, regular checks, nutritional support, and information for fetal development. Drinking, smoking, and drug use by mothers have a significant effect on birth weight. Socioeconomic factors are also significant; poverty and a lack of resources lead to subpar nutrition and prenatal care. Low educational attainment.

This study sheds light on the prevalence and contributing causes of LBW in rural, tribal Gujarat. 25.4% of the 414 newborns weighed less than 2.5 kg at birth. It is essential to constantly monitor birth weights in order to identify infants who may be at danger, given the high prevalence. Frequent weight-taking and thorough physical examinations to assess overall health are crucial elements of efficient monitoring.

An all-inclusive treatment strategy for low birth weight (LBW) newborns must include specialized neonatal care, which calls for tight coordination between medical professionals. The study also shows significant correlations between birth weight, mother education, and socioeconomic status. Lower maternal education levels are linked to higher rates of LBW because these women have less access to resources and healthcare.

Indicators of socioeconomic stability, which is critical for optimal nutrition and prenatal care, include income levels and the Mamta card. Furthermore, the research findings indicate a robust association between birth weight and certain components of prenatal care, including TT injections, health education, and supplemental feeding.

While there was no statistically significant correlation discovered between LBW and lifestyle factors such as tobacco use and smoking, alcohol consumption did. The strong relationship between birth weight and maternal nutrition status-including BMI and iron and folic acid supplements-highlighted the need of adequate maternal nutrition.

Better birth weights were strongly correlated with the frequency of meals and the intake of pulses, fruits, and vegetables. These findings emphasize how crucial eating is.

The study highlights the importance of targeted interventions that prioritize nutrition, economic stability, mother education, and access to prenatal care in order to improve birth outcomes in rural tribal communities. These findings expand on our understanding of LBW and serve as a roadmap for upcoming research projects and interventions aimed at enhancing the well-being of moms and their offspring in similar situations.

Conclusion

Low birth weight affects 25.4% of babies in the study who were born in Gujarat's rural tribal areas, suggesting a serious public health issue. Birth weight is highly influenced by variables

such maternal nutrition, prenatal care, socioeconomic position, and education. These results highlight how crucial it is to implement customized interventions that focus on nutrition, economic empowerment, healthcare access, and education in order to improve birth outcomes in comparable contexts.

Limitation

Although our study provides insightful information, it is important to recognize its limits. Response bias may be introduced by self-reported data. The narrow focus of the study limits its applicability to larger populations. Evaluating eating habits in isolation may fail to take long-term trends into account. Furthermore, an analysis of the precise kinds and amounts of fruits and vegetables consumed-which is essential for a comprehensive nutritional assessment-is absent from the study. It is important to take these restrictions into account when interpreting the results.

Recommendation

Following an analysis of the variables influencing low birth weight in rural tribal Gujarat, the following suggestions are put up to improve the health of both mothers and children:

1. *Educate:* Start focused awareness programs to emphasize the value of maternal education in lowering the risk of low birth weight. Empower: Create socioeconomic initiatives that support moms who are struggling financially.
2. *Early Care:* Especially in rural regions, strengthen healthcare services to provide early and frequent prenatal checkups.
3. *Nutrition:* Implement dietary diversity and low-BMI women-focused nutrition programs.
4. *Produce Accessibility:* Create programs to make fresh produce and fruits more easily accessible.
5. *Substance Abuse:* Adopt programs to help women who smoke and drink quit while expecting.
6. *Supplementation:* Advocate for dietary counselling and iron-folate supplementation.
7. *Healthy Lifestyle:* Promote the adoption of healthy

- **Ethical consideration**

Prioritizing participant well-being and safety ensures that there won't be any unforeseeable harm. Consent from participants will be given voluntarily, with confidentiality and privacy protected. There will be proper risk management and minimization.

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