Apr 7th, 9:00 AM - 12:00 PM

Low Birth Weight and Its Associated Risk Factors in The United States Using National Survey of Children Health Data 2016-2020

Olamide Asifat
East Tennessee State University

Adedeji Adenusi
East Tennessee State University

Sheryl Strasser
Georgia State University

Yan Cao
East Tennessee State University

Shimin Zheng
East Tennessee State University

Follow this and additional works at: https://dc.etsu.edu/asrf

Asifat, Olamide; Adenusi, Adedeji; Strasser, Sheryl; Cao, Yan; and Zheng, Shimin, "Low Birth Weight and Its Associated Risk Factors in The United States Using National Survey of Children Health Data 2016-2020" (2022). *Appalachian Student Research Forum & Jay S. Boland Undergraduate Research Symposium*. 119.
https://dc.etsu.edu/asrf/2022/schedule/119

Low Birth Weight and its Associated Risk Factors in The United States Using National Survey of Children Health Data 2016-2020

Olamide Asifat[1], Adedeji Adenusi[1], Sheryl Strasser[2], Yan Cao[3], Shimin Zheng[1]*

[1]Department of Biostatistics and Epidemiology, College of Public Health, East Tennessee State University
[2]Department of Health Promotion & Behavior, Georgia State University School of Public Health
[3]Research Center, College of Nursing, East Tennessee State University, *Sponsoring faculty

BACKGROUND

- Low birth weight(LBW) is defined by the World Health Organization as birth weight of less than 2500g, and it is one of the leading causes of infant morbidity and mortality globally. LBW is indicative of poor prenatal care and nutrition in pregnancy, impacting on non-communicable disease risk burden throughout life. However, reductions in morbidity and mortality in children can be achieved by addressing risk factors and predictors associated with LBW.

OBJECTIVES

- To examine the association between maternal socio-demographics and lifestyle behaviors with birth outcomes to elicit risk patterns among mothers of infants of LBW.

METHODS

Data from the National Survey of Children Health for the years 2016-2020 were used in this analysis; n=174,551, aged 0-17years,13,752(9.19%) with LBW(<2,500g), 2,124(1.45%) with very LBW(<1500g) in five years. Bivariate analyses were performed to deduce the demographics, birth characteristics, and their proportions.

Logistic regression was used to calculate crude odds ratios and 95% confidence intervals, with the dependent variable LBW. We followed with adjusted odds ratios, which controlled for mother's demographic variables, socioeconomic status, marital status, behavioral characteristics, and items related to children's health.

Key Findings

- The average prevalence of LBW infants born between 2016-2020 was 9.19%, and 1.45% meeting the threshold of very LBW. In terms of age, the odds of LBW among mothers aged 18 or below were 32.9% higher, odds ratio (OR) 1.33, 95% confidence interval (CI) 1.08-1.64; the odds of LBW among mothers older than 35 were 21.2% higher(1.21,1.10-1.33) than mothers between ages 19-35.

- Based on maternal health status, the odds of LBW was 95.5% higher among children whose parents reported good health vs. excellent health(1.96,1.71-2.22).However, the odds of LBW was nearly three times higher if the parent's health status was poor vs. excellent (2.98, 2.33-3.81). Based on race, the odds of delivering LBW babies was higher for African American (1.91,1.73-2.11), Asian (1.56,1.32-1.84),Native Hawaiian, & Other Pacific Islander (1.71,1.05-2.80) when compared with White mothers. We also found that the odds of LBW in households with cigarettes use was 19.6%(1.20,1.08-1.32) higher than in households without cigarette use. Presence of parents or guardians in households with mental illness or having drug/alcohol problems was associated with greater odds of LBW (1.18,1.03-1.36) and (1.18,1.05-1.33) respectively compared with households reporting none. The odds of LBW were lower among households where parents or guardians reported being married vs. single (0.78,0.72-0.85) and among those reporting some college education or above vs. high school or less (0.84,0.77-0.93).

RESULTS

Table 1. Characteristics of Study Participants, NSCH 2016-2020

.Variable	Low Birth Weight N(%)		Normal Birth Weight N(%)		Total (N)
Age of Mother (years)					
< 18 years	260,811	(11.28)	2,051,064	(88.72)	2,311, 875
18-35	4,762,912	(8.73)	49,764,616	(91.27)	54,572, 528
>35	1,157,958	(10.39)	9,983, 706	(89.61)	11,141, 664
General Health					
Excellent	3,616,872	(7.92)	42,063,688	(92.08)	45,680,561
Very Good	1,692,392	(10.22)	14,866,505	(89.78)	16,558,898
Good	798,239	(14.39)	4,749,716	(85.61)	5,547,955
Poor	209,271	(20.41)	816,057	(79.59)	1,025,328
Race of Selected Child					
White	3,739,434	(8.03)	42,836,638	(91.97)	46,576,072
Black or African American	1,328,995	(14.27)	7,981,007	(85.73)	9,310,002
American Indian or Alaska Native	66,128	(7.24)	847,805	(92.76)	913,934
Asian	387,725	(12.00)	2,843,131	(88.00)	3,230,856
Native Hawaiian and Other Pacific Islanders	102,587	(13.00)	686,312	(87.00)	788,898
Other Race	173,939	(7.29)	2,210,438	(92.71)	2,384,377
	542,457	(9.40)	5,227,475	(90.60)	5,769,932
Household Cigarettes Use					
Yes	1,050,250	(10.51)	8,946,707	(89.49)	9,996,957
No	5,149,610	(8.94)	52,461,481	(91.06)	57,611,092
Birth Order of Selected Children in Household					
Only Child	1,642,425	(9.39)	15,855,792	(90.61)	17,498,217
Oldest Child	2,288,769	(11.25)	18,047,645	(88.75)	20,336,414
Second Oldest Child	1,625,034	(7.72)	19,413,452	(92.28)	21,038,486
Third Oldest Children	641,805	(8.09)	7,288,350	(91.91)	7,930,155
Fourth or greater oldest child	143,232	(6.60)	2,027,568	(93.40)	2,170,801
Hard to Cover Basics Like Food or Housing					
Never	2,827,783	(8.63)	29,952,104	(91.37)	32,779,886
Rarely	2,085,346	(9.31)	20,317,620	(90.69)	22,402,966
Somewhat often	957,938	(10.05)	8,571,172	(89.95)	9,529,111
Very often	302,299	(11.03)	2,437,924	(88.97)	2,740,222
Lived with person with Alcohol					
Yes	570,521	(10.45)	4,890,527	(89.55)	5,461,047
No	5,473,818	(8.98)	55,476,701	(91.02)	60,950,518
Behavioral Treatment					
Yes	324,881	(13.23)	2,130,766	(86.77)	2,455,648
No	381,716	(11.33)	2,987,712	(88.67)	3,369,428
Anxiety Currently					
Yes	553,648	(11.76)	4,155,057	(88.24)	4,708,705
No	50,666	(6.25)	759,524	(93.75)	
Marital Status					
Yes	4,212,192	(8.57)	44,919,673	(91.43)	49,131,865
No	1,909,602	(10.72)	15,898,316	(89.28)	17,807,919
Highest Years of School					
Yes	1,933,817	(10.25)	16,934,447	(89.75)	18,868,264
No	4,368,725	(8.77)	45,469,466	(91.23)	49,838,191
Current Employment Status					
Employed	916,846	(9.43)	8,801,354	(90.57)	9,718,200
Unemployed	335,565	(9.18)	3,321,234	(90.82)	3,656,798

Table 2. Multiple Logistic Regression Analysis

Variables	Adjusted Odds Ratio (aOR)	95% Confidence Interval	P-value
Household with mental illness			
Yes vs No	1.18	1.03-1.36	0.0186
Household with alcohol problem			
Yes vs No	1.18	1.05-1.33	0.0066
Mental Health Status			
Good Health vs excellent	1.96	1.71– 2.22	<.0001
Poor Health vs excellent	2.98	2.33- 3.81	<.0001
Very Good vs excellent	1.32	1.21-1.45	<.0001
Race			
African American vs White alone	1.91	1.73-2.11	0.0001
Asian vs White alone	1.56	1.32-1.84	0.0001
Native Hawaiian vs White alone	1.71	1.05-2.80	0.0315
American Indian or Alaska native vs White Alone	0.89	0.62-1.29	0.5456
Two or more races vs White Alone	1.19	1.03-1.37	0.0177
Race vs white alone	0.90	0.71-1.14	0.3839
Age ≤ 18 vs 18< and ≤35	1.33	1.08-1.64	0.0072
> 35 vs 18< and ≤35	1.21	1.10-1.33	<0.0001
Married			
Married vs Single	0.78	0.72-0.85	<.0001
College education or above vs high school or less	0.841	0.77 – 0.93	<.0004
Households Cigarette use			
Yes vs No	1.20	1.08-1.32	0.0006

CONCLUSION

- Results of our study revealed that there is a greater risk of LBW babies among non-White mothers who: had high school education or less, were unmarried, younger than 18 or older than 35, and lived in households where smoking, substance use problems, or mental illness were present. This can inform health promotion and clinical guidance during prenatal care to provide interventions tailored to the healthcare needs of mothers at risk for LBW babies to disrupt patterns of LBW children who stand to face a lifetime of poor health outcomes.