PREVALENCE AND RISK FACTORS OF LOW BIRTH WEIGHT:
A SYSTEMATIC REVIEW

Tahira Ashraf[1,2], Asif Hanif,[2,3] Nyi Nyi Naing[4], Nadiah Wan-Arfah[5]
[1]University Institute of Radiological Sciences & Medical Imaging Technology, Faculty of Allied Health Sciences, The University of Lahore
[2]Biostatistics, Faculty of Medicine, Universiti Sultan Zainal Abidin, Medical Campus, Kuala Terengganu, Malaysia
[3]Associate Prof. Biostatistics: University Institute of Public Health, Faculty of Allied Health Sciences, The University of Lahore
[4]Faculty of Medicine, Universiti Sultan Zainal Abidin, Medical Campus, Kuala Terengganu, Malaysia
[5]Faculty of Health Sciences, Universiti Sultan Zainal Abidin, Gong Badak Campus, Kuala Terengganu, Malaysia
Corresponding author: Nyi Nyi Naing
Universiti Sultan Zainal Abidin, Medical Campus, Jalan Sultan Mahmood, 20400 Kuala Terengganu, Terengganu, Malaysia
Phone: +609-6688760**, Fax:** +609-6275771
Email: syedhatim@unisza.edu.my

ABSTRACT:
Background: Low Birth Weight (LBW) is a critical health issue with serious feto-maternal outcomes. Maternal risk factors are associated with LBW therefore it is important to review published studies systematically for the prevalence of LBW and determine its significant risk factors.
Objective: To review published prevalence and risk factors of low birth weight from years 2009-19
Materials and Methods: All full-length studies done on the prevalence and/or risk factors of LBW freely available on the internet using Search engines like Google scholar, the web of science, Cochran library and PubMed, with the BOOLEAN search strategy. 13 articles were shortlisted after critical analysis using PRISMA guidelines. Endnote version 7 was used to store these studies which were later critically reviewed.
Results: The studies published from 2009-19 were selected. The prevalence of LBW ranged from 6.16-38%. Maternal socio-demographic (young maternal age, lack of education, low socioeconomic status and residence in a rural area), medical (Maternal anemia, preeclampsia, history of other maternal diseases and complications such as renal diseases, UTI, HIV, venereal disease, bleeding during pregnancy, history of abortion or LBW baby) and antenatal factors (lack of antenatal care, unbooked delivery status, and not taking IAF regularly) were significantly associated with LBW.
Conclusion: Low Birth Weight remains to be a challenge as its prevalence is high worldwide. Maternal socio-demographic, maternal and antenatal risk factors are significantly associated with low birth weight. This review may help policymakers to design specific interventions targeting the prevention of low birth weight in the future.

Keywords: Low Birth Weight, Abnormal Weight, Premature, Prevalence, Risk Factors, Maternal, Causes

INTRODUCTION:

Birth weight is defined as the weight taken at the time of birth and Low Birth Weight (LBW) is the birth weight less than 2,500 gm. Birth weight is an important feotal health indicator and LBW is one of the commonest causes of infant mortality as well as morbidity. [1]

Various epidemiological studies have proved that the newborns with low birth weight have approximately 20 times greater chances of death compared to normal weighted babies. [2] The prevalence of LBW has been estimated to be 5% in the developed, industrialized countries and varies from 5-30% in developing and underdeveloped countries [3] For Asian countries, the prevalence is as high as 30% in India and Bangladesh, 22% in Sri Lanka and 19% in Pakistan. These percentages are much higher than our neighboring countries, such as 6% in China and 7% in Iran. [4] Moreover, LBW also causes as much as 60% of newborn mortality before their first birthday and as much as 40 times greater risk of deaths in the first month. [1]

Literature reports that countries with a high prevalence of LBW also have high rates of malnutrition and neonatal mortality. [5] Malnutrition and infections further complicate problems as a cognitive and i

ntellectual abnormality and overall retardation in physical growth. [6]Other chronic disorders due to LBW include diabetes mellitus, hypertension, asthma, atherosclerosis, obesity, hepatoblastoma, renal disease and psychological stress. [7]

As evident from the published literature, LBW is a significant problem for feto-maternal health and may pose lasting consequences on the health of newborns. Moreover, it poses a considerable burden on the healthcare system and lacks systematic reviews locally. Therefore this study aims to systematically and critically review the prevalence and risk factors of LBW.

MATERIALS AND METHODS:

Reporting: All full-length studies were done on the prevalence and/or risk factors of LBW freely available on the internet were accessed. The results of these studies were reported with help of Preferred Reporting Items for Systematic Review and Meta-Analysis statement (PRISMA) guidelines [8].

Inclusion and Exclusion Criteria: All original full-length articles using observational study designs including analytical cross-sectional, case-control and retrospective cohort were included in this review. The study period of 2009-2019 was chosen. Studies that reported the prevalence of low birth weight and/or its maternal risk factors were included. Studies having an irrelevant title, objectives, methods, or statistical tests were excluded. All the studies having incomplete, or confusing contents, methods, references and author information were also excluded. Studies that were not freely accessible, or that only had abstracts visible were also not included. For assuring completeness of desired attributes a checklist containing title, year of study, venue, study design,

sample size, inclusion and exclusion criteria, reported prevalence and risk factors was made. After the initial selection, this checklist was used for critical analysis of all given components.

Search Strategy and Information Sources: The web sources including Google Scholar, PubMed, Web of Science and Cochrane library were used to search the articles. The search for relevant studies using terms was done using the BOOLEAN search strategy. The terms used in phrases and/or keywords included "birth weight", "abnormal birth weight", "low birth weight", "neonates", "birth outcome", "preterm birth", "risk factors", "causes", "factors", "maternal risk factors", "prevalence", "frequency" and "LBW". Additionally, to fit advanced PubMed search, MeSH terms such as "Newborn OR neonate OR infant AND birth weight OR low birth weight OR abnormal birth weight OR underweight AND risk factors OR factors OR causes AND Prevalence" and other synonyms were also used.

Study Selection: In the first step, studies were retrieved in a reference management software named ENDNOTE version 7 for storage and avoiding duplication. The retrieved studies were then assessed through the abovementioned checklist. Irrelevant or ambiguous studies were excluded. In the second step, two authors (AH and FZ) critically analyzed the contents of articles. Those articles that were not in line with the title, had irrelevant variables or inappropriate analysis, had statistical and methodological errors and other issues were excluded from the study. Any disagreement between the individuals was resolved by consensus.

Data Extraction: A structured data extraction form was made for the purpose of extracting information from selected studies. First author, Year, Study Design, sample size, prevalence, and risk factors were components of the form. The two reviewers independently extracted the data from the articles. Any discrepancy in reported data was rechecked and corrected by a third reviewer.

Table-1: Prevalence and Risk Factors of Low Birth Weight in Selected Studies					
		Study Design	N	n	Risk Factors
1	Saeed et al., (2014) [9]	Cross Sectional Study	381	50 (13%)	lack of adequate education (OR= 1.9, 95% CI= 1.03-3.47; P= 0.04), gestational age (OR= 5.5, 95% CI= 2.8–10.9; P< 0.001), type of pregnancy (OR= 9.6, 95% CI= 4.1–22.7; P< 0.001), presence of hypertension (OR= 3.6, 95% CI= 1.6-7.8; P= 0.001), renal disease (OR= 2.1, 95% CI= 1–4.5; P= 0.046), bleeding during pregnancy (OR= 6.1, 95% CI= 2.6-14.3; P< 0.001) and presence of moderate or severe anemia (OR= 3.19, 95% CI= 1.35–7.58; P= 0.008).
2	Elhassan *et al.,* (2010) [10]	Case Control Study	1224	97 (12.6%)	lack of antenatal care (OR= 5.9, p-value= 0.01) and maternal anemia (OR= 9.0 , p-value<0.01)
3	*Gebregzabiherher et al.,* (2017) [11]	Cross-sectional study	424	42 (10%)	Age <20 years (OR= 1.710, CI 2.165–17.689), history of abortion (OR=2.423, CI 1.744–15.317), and HIV status (OR= 6.121, CI 1.213–13.897)
4	Mirzarahimi *et al.,* (2013) [12]	Case -Control Study	6,832	432 (6.3%)	fetus≥2 (OR=3.77, CI: 1.41-10.0, p=0.008), bleeding or spotting during pregnancy (OR=2.23, CI:1.22-4.07,p=0.009), History of cesarean section (OR=0.311 , CI: 0.10-0.96, p=0.043, Spouse smoking (OR=2.24, CI: 1.07-4.68, p=0.031), and UTI in weeks 26-30 (OR=2.42, CI: 1.11-5.26, p=0.026)
5	Golestan *et al.,* (2011) [13]	Cross Sectional	5,897	519 (8.8%)	preterm labour (OR= 5.2, 95 percent confidence interval [CI] 4.8-6.11), working mothers (OR 2.7, 95 percent CI 1.25-3.1) and pregnancy-induced hypertension (OR 1.5, 95 percent CI 1.2-2.22)
6	Jafari, *et al.,* (2010) [14]	Prospective Study	4510	305 (6.8%)	Mothers with a primary and secondary education [odds ratio (OR) 6.83, 95% confidence interval (CI) 2.35-7.34 and OR 4.81, 95%CI 1.95-6.37, respectively], who lived with the farmer and unskilled worker husbands (OR 2.52, 95%CI 1.12-4.66 and OR 2.91, 95%CI 1.35-2.52, respectively), with a birth interval of 1 year or less (OR 3.54, 95%CI 1.80-5.95) and height less than 155cm (OR 1.82, 95%CI 1.12-3.31)
7	Col *et al.,* (2009) [15]	Retrospective Study	650	40 (6.16%)	Preeclampsia (p-value<0.01), maternal BMI (p-value<0.01 for BMI level<20), unbooked delivery status (p-value<0.01), and poor obstetric history (p-value<0.01)
8	Kumar *et al.,* (2017) [16]	Cross sectional	800	136 (17%)	Baby gender (p-value=0.007), Socio-economic status (p-value=0.001), Mother's occupation (p-value=0.018), Hb in third semester (p-value=0.003), IFA intake (p-value<0.001), Joint family system (p-value<0.001)

9	Sudha *et al*., (2017)[17]	Cross Sectional	341	116 (34.1%)	Income >50,000 (p-value=0.005), Job holders (p-value= 0.031) and illetracy (0.02)
10	Waghodia et al., (2017)[18]	Cross-Sectional Study	100	38 (38%)	Maternal age less than 20 years (OR= 2.1), hemoglobin less than 10 (OR=1.7) and maternal education (OR= 1.4)
11	(Bhattacharjya *et al*., (2015) [19]	Cross Sectional Study	305	73(23.9%)	rural residence (OR= 28.6, p-value= 0.017), maternal anemia (OR= 28.8%, p-value= 0.004), normal vaginal delivery (OR= 32.8%, p-value= 0.001) and venereal disease reactive (OR= 83.3%, p-value= 0.002)
12	(Dahlui *et al*., (2016)[20]	Cross-Sectional Study	5,189	379 (7.3%)	twin pregnancy (AOR= 5.11), primiparous delivery (AOR= 2.08), weight of mother<70kg (AOR= 1.92), and mutual jobs of parents (AOR= 1.91)
13	Sutan *et al*., (2014) [21]	Case Control Study	3214	356 (11.08%)	Gestational Age (p-value<0.001), Maternal age (p-value<0.001), Hypertension (p-value<0.041), History of LBW (p-value<0.045)

RESULTS:

Initially, 207 studies were selected. However, after critical assessment, 13 studies were shortlisted for this review. These studies ranged from the year 2009 to 2017. Among these studies, 4 (30.77%) were published in 2017, 2 (15.38%) were from 2014, 2 (15.38%) from 2010, and 1 (7.69%) each from 2009, 2011, 2013, 2015 and 2016.

Waghodia *et al*,. conducted a cross-sectional hospital-based survey in 2017 in which 100 pregnant women were included. The prevalence reported in this study was highest at 38%. The factors having a higher risk of Low Birth Weight were reported as maternal age less than 20 years (OR= 2.1), hemoglobin less than 10 (OR=1.7) and maternal education (OR= 1.4). [18]

Another cross-sectional study conducted by Bhattacharjya, H. *et al*. and published in 2015 included 305 females. They reported 23.9% prevalence with 73 Low Birth Weight babies. Low birth weight was significantly higher among mothers living in rural areas (OR= 28.6, p-value= 0.017), anemic mothers (OR= 28.8%, p-value= 0.004), who delivered with normal vaginal delivery (OR= 32.8%, p-value= 0.001) and with venereal disease reactive (OR= 83.3%, p-value= 0.002). [19]

In 2009, Col *et al*., conducted a retrospective study on 650 pregnancies among which 40 delivered LBW babies. The reported prevalence was 6.16. The significant risk factors of LBW reported in this study were preeclampsia (p-value<0.01), maternal BMI (p-value<0.01 for BMI level<20), unbooked delivery status (p-value<0.01), and poor obstetric history (p-value<0.01). [22]

Dahlui *et al*., in 2016 published an article using Nigeria Demographic and Health Survey (NDHS) data which is a cross-sectional database stratified with three-stage cluster design. The study included 5189 subjects and reported a prevalence of 7.3%. They calculated the adjusted odds ratio using multiple logistic regression and showed that significant risk factors were twin pregnancy (AOR= 5.11), primiparous delivery (AOR= 2.08), the weight of mother<70kg (AOR= 1.92), and mutual jobs of parents (AOR= 1.91). [23]

One case-control study published in 2010 by Elhassan et al., included 1224 mothers. The prevalence reported in this study was 12.6%. In this study, lack of antenatal care and maternal anemia were significant factors (OR= 5.9 & 9.0 and p-values= 0.01 & <0.01 respectively). [10]

Gebregzabiherher *et al.,* conducted a cross-sectional study in 2017 that included 424 mothers using a systematic sampling technique. The prevalence reported in this study was 10%. The significant risk factors were observed at age <20 years (OR= 1.710, CI 2.165–17.689), history of abortion (OR=2.423, CI 1.744–15.317), and HIV status (OR= 6.121, CI 1.213–13.897) using multivariable analysis. [11]

Mirzarahimi et al., did a case-control study in 2013 in which 6,832 mothers were included. The prevalence of LBW was reported to be 6.3% as 432 LBW babies were born. Among term low birth infants, the significant risk factors were number of fetus≥2 (OR=3.77, CI: 1.41-10.0, P=0.008), bleeding or spotting during pregnancy (OR=2.23, CI:1.22-4.07,P=0.009), History of cesarean section (OR=0.311 , CI: 0.10-0.96, P=0.043, Spouse smoking (OR=2.24, CI: 1.07-4.68, P=0.031), and UTI in weeks 26-30 (OR=2.42, CI: 1.11-5.26, P=0.026). [12]

Saeed *et al*., did a cross-sectional study in 2014 and included 381 females. The reported prevalence in this study was 13% whereas using univariate analysis the significant risk factors for LBW were reported as lack of adequate education (OR= 1.9, 95% CI= 1.03-3.47; P= 0.04), gestational age (OR= 5.5, 95% CI= 2.8–10.9; P< 0.001), type of pregnancy (OR= 9.6, 95% CI= 4.1–22.7; P< 0.001), presence of hypertension (OR= 3.6, 95% CI= 1.6-7.8; P= 0.001), renal disease (OR= 2.1, 95% CI= 1–4.5; P= 0.046), bleeding during pregnancy (OR= 6.1, 95% CI= 2.6-14.3; P< 0.001) and presence of moderate or severe anemia (OR= 3.19, 95% CI= 1.35–7.58; P= 0.008). [9]

In a cross-sectional survey conducted by Golestan et al, the prevalence of LBW was reported to be 8.8%, with significant risk factors of preterm labour (OR= 5.2, 95% CI 4.8-6.11), working mothers (OR 2.7, 95% CI 1.25-3.1) and pregnancy-induced hypertension (OR 1.5, 95% CI 1.2-2.22) [13]

In 2017, Kumar et al., did a cross-sectional study and found the prevalence of LBW as 17%. The significant risk factors included Baby gender (p-value=0.007), Socio-economic status (p-value=0.001), Mother's occupation (p-value=0.018), Hb in third semester (p-value=0.003), IFA intake (p-value<0.001), Joint family system (p-value<0.001) [16]

Similarly, Sutan et al., did a case-control study and found the prevalence of LBW as 11.08%. Whereas, Gestational Age (p-value<0.001), Maternal age (p-value<0.001), Hypertension

(p-value<0.041), History of LBW (p-value<0.045) were significant risk factors associated with LBW. [21]

Sudha et al. did a cross-sectional study on 341 subjects and reported a prevalence of 34.1%. The significant risk factors in this study were Income >50,000 (p-value=0.005), Job holders (p-value= 0.031) and illiteracy (0.02) [17]

DISCUSSION:

One of the basic Millennium Development Goals (MDGs) -4 was to reduce the mortality under 5 years children by two thirds, and it remains to be an important component of Sustainable Development Goals (SDGs) that all countries must try to reduce infant mortality to 12 per 1000 by 2030. [24] However, to this date, LBW is a condition responsible for considerable health complications for neonates. These complications may prove fatal as well. [25] This study focused on reviewing the prevalence and risk factors reported in the literature in the recent most decade. In this review, we selected studies from 2009-19 through PRISMA guidelines and assessed those studies in detail. Out of 207 studies selected initially, 13 were shortlisted.

A number of socio-demographic factors have an influence on neonatal weight and delivery outcomes. Among the maternal socio-demographic risk factors, young maternal age, lack of education, low socioeconomic status and residence in a rural area were the most prominent factors. [9, 11, 14, 16-19, 21]

Maternal anemia or low Hb was also one of the leading risk factors as reported by many of the included studies. [9, 10, 16, 18, 19, 22] Similarly, maternal hypertension, pregnancy-induced hypertension or preeclampsia is another major risk factor of LBW. [9, 13, 21] History of other maternal diseases and complications such as renal diseases, UTI, HIV, venereal disease, bleeding during pregnancy, history of abortion or LBW baby are also significantly associated with LBW. [9, 11, 12, 19, 21] History of cesarean delivery and poor obstetric history are also responsible for LBW. [12, 22] Literature supports the significant impact of maternal medical factors on LBW as reported in many studies. [26, 27]

The role of antenatal care and visits is equally crucial as regular antenatal visits and following antenatal advice can reduce the risk for LBW. [28] In the current review, we found that lack of antenatal care, unbooked delivery status, and not taking IAF regularly [10, 16, 22] were significant antenatal related factors potentially responsible for LBW. These facts agree with published literature that emphasizes the importance of proper antenatal care and insists that visiting care provider regularly and following their advice can lessen the burden of LBW. [14, 29]

It is, hence, quite clear from this review that although LBW is a multifactorial problem, however, the influence of maternal risk factors dominates all others. This has also been observed that although some biological or environmental factors are uncontrollable, some modifiable risk factors can be dealt with to potentially decrease the incidence of LBW in the future. These modifiable risk factors include proper intake of diet to avoid malnutrition, control anemia, have healthy physical activities and education and awareness for getting pregnant at a safe age.

Moreover, an immediate initiative of intensive awareness programs targeting women for general health and nutrition, self-care, and to maintain a healthy pregnancy should be started. These may help in the reduction of the burden of LBW on healthcare systems and reduce subsequent costs and loss of lives to ensure a better future for newborns and their mothers.

CONCLUSION: Low Birth Weight remains to be a challenge as its prevalence is high worldwide. Maternal socio-demographic, maternal and antenatal risk factors are significantly associated with low birth weight. This review may help policymakers to design specific interventions targeting the prevention of low birth weight in the future.

REFERENCES:

1. Wardlaw TM. Low Birthweight: Country, regional and global estimates: UNICEF; 2004.
2. Ohlsson A, Shah P. Determinants and prevention of low birth weight: a synopsis of the evidence: Institute of Health Economics; 2008.
3. Altuncu E, Kavuncuoğlu S, Özdemir Gökmirza P, Albayrak Z, Arduç A. The incidence of low birth weight in 5000 liveborn infants and the etiology of fetal risk factors. 2006.
4. UNICEF. The state of the world's children 2006: excluded and invisible: Unicef; 2005.
5. Kader M, Perera NKP. Socio-economic and nutritional determinants of low birth weight in India. North American journal of medical sciences. 2014;6(7):302.
6. Mahmoodi Z, Karimlou M, Sajjadi H, Dejman M, Vameghi M, Dolatian M. Working conditions, socioeconomic factors and low birth weight: path analysis. Iranian Red Crescent Medical Journal. 2013;15(9):836.
7. Anjum F, Javed T, Afzal MF, Sheikh GA. Maternal Risk Factors Associated with Low Birth Weight: A Case Control Study. Annals of King Edward Medical University. 2012;17(3).
8. Hutton B, Salanti G, Caldwell DM, Chaimani A, Schmid CH, Cameron C, et al. The PRISMA extension statement for reporting of systematic reviews incorporating network meta-analyses of health care interventions: checklist and explanations. Annals of internal medicine. 2015;162(11):777-84.
9. Saeed OA, Ahmed HA, Ibrahim AM, Mahmood EA, Abdu-Allah TO. Risk factors of low birth weight at three hospitals in Khartoum state, Sudan. Sudan J Paediatr. 2014;14(2):22-8.
10. Elhassan EM, Abbaker AO, Haggaz AD, Abubaker MS, Adam I. Anaemia and low birth weight in Medani, Hospital Sudan. BMC Res Notes. 2010;3(1):1-5.
11. Gebregzabiherher Y, Haftu A, Weldemariam S, Gebrehiwet H. The prevalence and risk factors for low birth weight among term newborns in Adwa General Hospital, Northern Ethiopia. Obstetr Gynecol Int. 2017;2017:1-7.
12. Mirzarahimi M, Hazrati S, Ahmadi P, Alijahan R. Prevalence and risk factors for low birth weight in Ardabil, Iran. Iran J Neonatol. 2013;4(1):18-23.

13. Golestan M, Akhavan Karbasi S, Fallah R. Prevalence and risk factors for low birth weight in Yazd, Iran. Singapore Med J. 2011;52(10):730-3.

14. Jafari F, Eftekhar H, Pourreza A, Mousavi J. Socio-economic and medical determinants of low birth weight in Iran: 20 years after establishment of a primary healthcare network. Public health. 2010;124(3):153-8.

15. Col GSL, Capt RC, Maj KS. Maternal factors for low birth weight babies. Med J Armed Forces India. 2009;65(1):10-2.

16. Kumar M, Verma R, Khanna P, Bhalla K, Kumar R, Dhaka R, et al. Prevalence and associate factors of low birth weight in North Indian babies: a rural based study. Int J Community Med Public Health. 2017;4(9):3212-7.

21. Sutan R, Mohtar M, Mahat AN, Tamil AM. Determinant of low birth weight infants: A matched case control study. Open J Prevent Med. 2014;4(03):91-9.

22. Col GSL, Capt RC, Maj KS. Maternal factors for low birth weight babies. Medical Journal Armed Forces India. 2009;65(1):10-2.

23. Dahlui M, Azahar N, Oche OM, Aziz NA. Risk factors for low birth weight in Nigeria: evidence from the 2013 Nigeria Demographic and Health Survey. Global health action. 2016;9(1):28822.

24. You D, Hug L, Ejdemyr S, Beise J. Levels and trends in child mortality. Estimates developed by the UN Inter-agency Group for Child Mortality Estimation (IGME).Report 2015. 2015.

25. Atasay B, Günlemez A, Unal S, Arsan S. Outcomes of very low birth weight infants in a newborn tertiary center in Turkey, 1997-2000. The Turkish journal of pediatrics. 2002;45(4):283-9.

17. Sudha G, Reddy T, Narasimhulu S, Reddy K, Reddy K. Prevalence and Correlates of Low Birth Weight in Chittoor District of Andhra Pradesh, India. Obstet Gynecol Int J. 2017;7(1):1-5.

18. Waghodia V. A community based cross sectional study on the prevalence of low birth weight neonates and maternal factor responsible for the low birth weight. Asian Pac J Health Sci. 2017;4(3):239-44

19. Bhattacharjya H, Das S, Ghosh D. Proportion of low birth weight and related factors in a tertiary care institute of Tripura. Int J Med Public Health. 2015;5(1):10-3.

20. Dahlui M, Azahar N, Oche OM, Aziz NA. Risk factors for low birth weight in Nigeria: evidence from the 2013 Nigeria Demographic and Health Survey. Global Health Action. 2016;9(1):1-9.

26. Bhatti A, Naz S, Majid E, Bhatti N. Maternal risk factors associated with low birth weight babies. Med Channel. 2010;16(2):334-8.

27. Atuahene M, Mensah D, Adjuik M. A cross-sectional study of determinants of birth weight of neonates in the Greater Accra region of Ghana. Maternal health, neonatology and perinatology. 2015;1(1):23.

28. Rahman A, Bunn J, Lovel H, Creed F. Association between antenatal depression and low birthweight in a developing country. Acta Psychiatrica Scandinavica. 2007;115(6):481-6.

29. Ratowiecki J, Poletta FA, Giménez LG, Gili JA, Pawluk MS, López JC. Prevalence of low birth weight in a scenario of economic depression in Argentina. Archivos argentinos de pediatria. 2018;116(5):322-7.