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Low birth weight and birth weight status in Bangladesh: A systematic review and meta-analysis

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Abstract: The prevalence of low birth weight (LBW) is high in Bangladesh, but no study has collated recent estimates of LBW prevalence from throughout the country. The aim of this meta-analysis was to evaluate the prevalence of LBW and birth weight status in Bangladesh. We searched PubMed, Medline, Ovo and Google Scholar to find published articles in national and international journals from 2000–2020 and reviewed for relevance. Meta-analysis and Q test were performed to estimate the prevalence and heterogeneity of LBW from all included articles. Meta-regression was done to quantify associations with sample size and study year. Stratified analysis was conducted and effect size calculated for differences in LBW prevalence by sex, division and urban/rural area. In total 48 studies with 166,520 births were found and included in this meta-analysis. The pooled prevalence of LBW was 29.1% (95% CI, 28.9–29.3%) in overall, 29.9% (29.7–30.2%) in rural and 15.7% (14.9–16.6%) in urban areas. There was no significant difference in average birth weight between boys and girls (SD, 0.71; 95% CI, −0.43–1.83). Prevalence of LBW was higher in north-east Bangladesh compared to other zones ($p<0.05$). The pooled prevalence of LBW did not change significantly for last two decades. The prevalence of LBW in Bangladesh remains high. Lack of improvement suggests an urgent need for scaled up maternal and prenatal interventions and services known to reduce LBW. Urban/rural and divisional differences in rates suggest areas of greatest need.

Key words: Prevalence, Neonatal weight, Newborns, Infants, Rural, Urban

Introduction

According to World Health Organization (WHO 2011), low birth weight (LBW) is defined as weight less than 2500 g at birth. LBW is a significant health indicator as it is one of the main causes of infant mortality, contributing to an estimated 40% of all deaths in children under 5 years of age (Ramakrishnan 2004; Karimi et al. 2019). LBW is also the second leading cause of neonatal death

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(Sethi et al. 2016). It is estimated that the prevalence of LBW is 14.6% globally, but health disparities are such that LBW prevalence is only 7% in North America, Europe, Australia and New Zealand, 14% in Sub-Saharan Africa, and 26.4% in Southern Asia (Blencowe et al. 2019). From survey data in Bangladesh, the prevalence of LBW was 36.2%, 29.0% and 27.8% in 2000, 2012 and 2015, respectively, which is approximately double the global rate (WHO 2019).

Preterm birth (<37 completed week of gestation) and intrauterine growth restriction (IUGR) are the main causes of LBW (Suzuki et al. 2008; Moraes et al. 2012; Katz et al. 2013; Lee et al. 2013). Other risk factors for LBW are higher maternal age, lower education, gravidity and parity, malnutrition, intensive physical activity during pregnancy, inadequate parental care, deprivation of social protection of family and poverty (Golestan et al. 2011; Nazari et al. 2013; Dandekar et al. 2014; Mansouri et al. 2017; Mirahmadizadeh et al. 2017; Momeni et al. 2017; Rahmati et al. 2020). In addition, risk of LBW is also influenced by infections, pregnancy complications (e.g., preeclampsia), maternal emotional distress, drug abuse, smoking and infertility (Heaman et al. 2013).

LBW babies are at higher risk of chronic diseases and mental-physical disabilities compared to normal weight babies (Risnes et al. 2011; Zeleke et al. 2012). Long term impacts of LBW in childhood include growth faltering, cognitive development deficits and increased rate of infectious diseases (Chiarotti et al. 2001). People born with LBW are also at increased risk of developing chronic diseases in adulthood such as hypertension, coronary heart disease, kidney disease, diabetes, stroke and obesity (Rich-Edwards et al. 1997; Shan et al. 2014). The impact of LBW can also be measured in terms of increased economic burden on the health care system, which has been estimated to be equal to one-third of the world's medical expenses (Adlshoar et al. 2006).

Bangladesh Demographic and Health Survey (BDHS) collects nationally-representative health data in urban and rural areas across Bangladesh every 4 years. The BDHS has limitations, because birth size is not measured at the time of birth and LBW is considered based on mothers' perception that the baby was "very small" or "smaller than average" at birth (Haque et al. 2015; Akter et al. 2017; Khan et al. 2017). Numerous randomized control trials (RCT), cross-sectional and case-control studies have been conducted in different parts of Bangladesh in the past two decades that reported birth weight and/or LBW prevalence based on measured weight at birth (Arifeen et al. 2012; Persson et al. 2012; Tofail et al. 2012; West et al. 2014; Klemm et al. 2015; Mridha et al. 2016; Rahman et al. 2017). A more thorough and nuanced picture of LBW in Bangladesh may be achieved through systematic review and meta-analysis of these studies. Therefore, we conducted a systematic review and meta-analysis to determine the pooled prevalence of LBW and to estimate the birth weight status in Bangladesh.

Materials and methods

Studies conducted using data from Bangladesh from 2000 to 2020 and published in national and international journals were reviewed and included in this meta-analysis by following Preferred Reporting Items for Systematic Review and Meta-Analysis (PRIMSA) standard guidelines for systematic review (Moher et al. 2009). Before starting, the search strategy, selection of studies, qualitative assessment of studies, data extraction and statistical analysis were discussed among authors.

Inclusion and exclusion criteria

Cohort, cross-sectional and case-control studies where either birth weight or prevalence of LBW or both were reported were included in this analysis. Very low birth weight (<1500 g) and extremely low birth weight (<1000 g) were included in the LBW outcome (WHO 2011). We excluded review articles, repeated articles, papers published from Bangladesh Demographic and Health Survey (BDHS) and other survey data, case studies, abstracts, posters, letter to editor and comments. Studies that used a different definition for LBW (not <2500 g) or a definition unrelated to birth weight were excluded. Studies conducted on specific groups such as mothers with chronic diseases, neonatal intensive care study, Kangaroo care of very low birth weight and sick infants were excluded.

Search strategy and selection of studies

PubMed/Medline, Ovo and Google Scholar were searched to find published articles on prevalence of low birth weight and birth weight status of the newborn in Bangladesh. Most articles were published in international scientific journals and very few were found in national journals. Medical Subject Headings (MeSH) terms and nonMeSH terms were used such as "birth weight", "low birth weight", "neonate", "underweight", "preterm birth", "incidence", "new born weight", "abnormal birth weight", "birth outcome", "infant" and other equivalent keywords were used with "Bangladesh". We did combine search using "AND" and "OR", for example, "premature birth weight AND Bangladesh", "low birth weight AND Bangladesh", "birth weight AND Bangladesh" "epidemiology AND "low birth weight" AND Bangladesh", "infant mortality" AND "low birth weight" AND Bangladesh, "very low birth weight AND Bangladesh", "preterm birth AND infant under-nutrition AND Bangladesh" etc. Additional relevant articles were identified from the 'Similar article' and 'Cited by' sections under Pubmed/Medline articles. We searched articles published from January 2000 to December 2020 and found 48 studies by using the search criteria starting year from 2000 to 2015 and ending year 2017. Articles only in English language has been included in this systematic review. The full strategy of searching on Pubmed/Medline has been documented in Supplementary table 1.

In the first step, abstracts of articles were downloaded, reviewed by authors and irrelevant abstracts were excluded. For relevant abstracts, full articles were located and downloaded. Some full articles were not available by using these keywords and we have searched on project websites, called or emailed the authors and found them. After completing the search, duplicate articles were removed. A lot of papers were published by different authors using the same study data. In those cases, we only included the first published article of the study and excluded other articles. Two independent investigators reviewed all eligible articles and in case of any disagreement (e.g., search strategy, inclusion/exclusion criteria etc) between investigators, discussed with other investigator until they could reach a resolution. After selecting the eligible articles, data were extracted regarding the name of first author, publication year, study duration, study design, place, division, sample size, birth weight and LBW percent (Table 1). Starting year of data collection was reported as study year for all studies.

Statistical analysis

We extracted mean birth weight, standard deviation and percent LBW from included articles. Some articles reported median and interquartile range and we calculated mean and standard deviation of birth weight for these. Funnel plot was made to identify the publication bias and Egger's regression test done to check the significant level of bias (Egger et al. 1997). Cochran's Q test and I^2 index were used to evaluate heterogeneity of the studies. I^2 is 0–24% may not be important, 25–49% suggests moderate heterogeneity, 50–75% indicates substantial amount of heterogeneity and >75% recommends significant heterogeneity (Guyatt et al. 2011). We performed meta-regression to subgroup analyses and made bubble plots for assessing differences in the prevalence of LBW and birth weight status by study year and sample size. Stratified meta-analyses were done by area of residence (rural/urban), child sex and administrative division. Effect size of birth weight was estimated and compared by area of residence (rural vs. urban) and sex (boys vs. girls). Pooled prevalence of LBW by division were tested and time-trend analysis was done. P-value <0.05 was considered as statistically significant. STATA 14 (Stata Corp, College Station, TX, USA) was used to analyze the data.

Results

In total, 3,027 articles were identified; of them 1,450 repeated articles were excluded. Following review of abstracts and full text by SS and MTI, 48 studies were included in this meta-analysis.

Of the included studies, 1 was case-control, 9 cross-sectional and 38 cohort studies.

Twenty-six studies reported both birth weight and percent of LBW, 16 studies reported only percent of LBW and 6 studies reported only birth weight. Six studies each reported birth weight and prevalence of LBW in boys and girls separately (Supplementary table 2). In total 28 and 20 studies were conducted in rural and urban areas, respectively. Most of the urban studies were conducted in Dhaka (Supplementary Figure 1). Total births were 166,520, of which 160,533 (96.4%) were in rural areas and 5987 (3.6%) were of urban areas. Most studies measured birth weight within 72 hours of birth and very few studies reported birth weight from birth record card. The prevalence of LBW ranged 6–55.3% (Zaman et al. 2008; Klemm et al. 2015). It was higher in rural studies compared to urban: the mean prevalence of LBW was 26.8% (95% CI, 22.4–31.2%) and 22.9% (95% CI, 18.6–27.2%) in rural and urban areas, respectively.

The funnel plot showed asymmetrical distribution (Supplementary Figure 2) and Egger's regression test confirmed the presence of publication bias (p = 0.006). The overall pooled prevalence of LBW based on meta-analysis was 29.1% (95% CI, 28.9–29.3%).

The heterogeneity calculated by Q test for prevalence of LBW was very high in the studies (I^2= 99.7%; p<0.001). In models stratified by area, the pooled

Table 1. Characteristics of studies entered into the meta-analysis

Reference	Study duration	Study design	Place	Division	Area	Sample size (n)	Birth weight (g)	SD of BW (g)	LBW (%)
Hosain et al. (2005)	2000–01	Cohort	Nayerhat	Dhaka	Rural	350	NA	NA	24.0
Tofail et al. (2012)	2000–01	Cohort	Dhaka	Dhaka	Urban	249	2555	265	26.5
Barua et al. (2009)	2000–02	Cohort	Azimpur	Dhaka	Urban	100	NA	NA	18.0
Persson et al. (2012)	2001–03	Cohort	Matlab	Chittagong	Rural	3267	2694	411	31.0
Asling-Monemi et al. (2009)	2002–04	Cohort	Matlab	Chittagong	Rural	3164	2701	403	33.0
Khatun and Rahman. (2008)	2002–03	Cohort	Azimpur	Dhaka	Rural	465	2674	425	23.2
Kwok et al. (2006)	2002–03	Cohort	Faridpur	Dhaka	Rural	2006	NA	NA	9.7
Frith et al. (2015)	2003–04	Cohort	Matlab	Chittagong	Rural	1041	2714	407	27.9
Azimul et al. (2009)	2003–05	Case-control	Dhaka	Dhaka	Urban	583	2762	NA	23.2
Mannan et al. (2008)	2003–05	Cohort	Sylhet	Sylhet	Rural	3495	NA	NA	19.5
Klemm et al. (2015)	2004–07	Cohort	Gaibandha	Rangpur	Rural	16290	2433	425	55.3
Hall et al. (2007)	2004–05	Cohort	Matlab	Chittagong	Rural	101	2752	456	NA
Zaman et al. (2008)	2004–05	Cohort	Dhaka	Dhaka	Urban	340	3050	510	6.0
Akter et al. (2012)	2005–06	Cohort	Dhaka	Dhaka	Urban	115	2640	310	29.4
Shakur et al (2009)	2005–07	Cohort	Gazipur	Dhaka	Rural	285	2800	400	36.1
Arifeen et al. (2012)	2007–09	Cohort	Sylhet	Sylhet	Rural	29056	2666	445	33.2
Jahan et al. (2014)	2007–08	Cohort	Azimpur	Dhaka	Urban	300	2735	270	23.7
Feller et al. (2012)	2007–10	Cohort	Matlab	Chittagong	Rural	391	NA	NA	18.0
Jesmin et al. (2011)	2007–08	Cross-sectional	Dhaka	Dhaka	Urban	380	NA	NA	20.5
West et al. (2014)	2008–12	Cohort	Gaibandha	Rangpur	Rural	21172	2558	411	43.0
Rahman et al. (2017)	2008–11	Cohort	Pabna	Rajshahi	Rural	1182	2837	408	16.4
Donowitz et al. (2016)	2008–12	Cohort	Dhaka	Dhaka	Urban	629	2719	411	32.0
Kile et al. (2016)	2008–11	Cohort	Pabna	Rajshahi	Rural	1153	2836	415	NA
Gurley et al. (2013)	2008–09	Cohort	Dhaka	Dhaka	Urban	257	NA	NA	36.0

Reference	Study duration	Study design	Place	Division	Area	Sample size (n)	Birth weight (g)	SD of BW (g)	LBW (%)
Karim et al. (2011)	2008–08	Cohort	Kapasia	Dhaka	Rural	565	2618	365	29.5
Nasreen et al. (2010)	2008–09	Cohort	Mymensingh	Mymensingh	Rural	583	2850	450	18.5
Alam et al. (2020)	2009–10	Cohort	Dhaka	Dhaka	Urban	186	2820	410	NA
Yasmeen and Azim (2011)	2009–09	Cross-sectional	Dhaka	Dhaka	Urban	102	NA	NA	25.5
Das et al. (2020)	2010–12	Cohort	Mirpur	Dhaka	Urban	265	2820	420	21.8
Gleason et al. (2016)	2010–13	Cohort	Pabna	Rajshahi	Rural	618	2850	400	14.6
Nguyen et al. (2017)	2010–14	Cross-sectional	Mymensingh	Mymensingh	Rural	2177	2910	890	NA
Roth et al. (2013)	2010–11	Cohort	Dhaka	Dhaka	Urban	144	2795	467	NA
Ahmed et al. (2020)	2011–15	Cross-sectional	Matlab	Chittagong	Rural	3831	2867	417	15.6
Bhowmik et al. (2019)	2011–12	Cohort	Dhaka	Dhaka	Urban	138	2814	404	11.6
Islam et al. (2013)	2011–12	Cross-sectional	Kustia	Khulna	Rural	510	NA	NA	29.4
Chan et al. (2013)	2011–11	Cohort	Dhaka	Dhaka	Urban	543	NA	NA	17.4
Saha et al. (2018)	2011–14	Cohort	Sylhet	Sylhet	Rural	19007	NA	NA	27.1
Ahmad et al. (2020)	2012–13	Cohort	Dhaka	Dhaka	Urban	306	2741	378	26.8
Hasan et al. (2019)	2012–14	Cross-sectional	Matlab	Chittagong	Rural	1463	2875	417	14.7
Mridha et al. (2016)	2012–13	Cohort	Parbatipur	Rangpur	Rural	3517	2609	411	37.8
Shapla et al. (2015)	2012–12	Cohort	Dhaka	Dhaka	Urban	206	NA	NA	33.5
Lee et al. (2019)	2012–15	Cohort	Sylhet	Sylhet	Rural	4729	2789	492	22.1
Raihana et al. (2019)	2013–15	Cohort	District	Dhaka	Rural	29873	NA	NA	20.6
Nahar et al. (2017)	2013–14	Cross-sectional	Dhaka	Dhaka	Urban	150	2631	520	31.3
Ali et al. (2016)	2013–14	Cross-sectional	Mymensingh	Mymensingh	Rural	8356	NA	NA	41.0
Haider and Saha (2016)	2013–15	Cohort	Chittagong	Chittagong	Urban	994	2600	285	6.1
Ferdos and Rahman (2017)	2015–16	Cross-sectional	Rajshahi	Rajshahi	Rural	400	NA	NA	29.2
Lee et al. (2020)	2015–17	Cohort	Sylhet	Sylhet	Rural	1486	2721	469	NA

BW – birth weight; LBW – low birth weight; NA – not available.

prevalence of LBW was 29.9% (95% CI, 29.7–30.2%) and 15.2% (95% CI, 14.3–16.1%) in rural and urban areas, respectively.

Heterogeneity was very high for prevalence of LBW in both rural (I^2 = 99.8%, $p<0.001$) and urban areas (I^2 = 96.7%, $p<0.001$).

The prevalence of LBW increased with an increase in study sample size (meta-regression coefficient, 0.0005; 95% CI, 0.00006–0.0008; $p = 0.026$.

No statistically significant change in prevalence of LBW was observed by study year (meta-regression coefficient, −0.028; 95% CI, −0.756–0.699; $p = 0.937$)

While birth weight appeared to be inversely associated with sample size ($p>0.05$, Supplementary Figures 3a) and positively associated with study year ($p>0.05$, Supplementary Figures 3b), the trends were not significant.

According to meta-regression for LBW and birth weight stratified by area of residence, prevalence of LBW did not differ by sample size or study year in models stratified by area. Similarly, birth weight status did not differ by sample size or study year when fitted in models stratified by area. In meta-regression model stratified by sex, prevalence of LBW and birth weight status did not differ between sexes.

Cohen's d test indicated that the average birth weight between urban and rural area were not statistically different (SD, −0.12; 95% CI, −0.80–0.55). Similarly, no difference was found in prevalence of LBW between urban and rural areas (SD calculated by Cohen's d was 0.39; 95% CI, −0.21–0.99). In estimates of effect

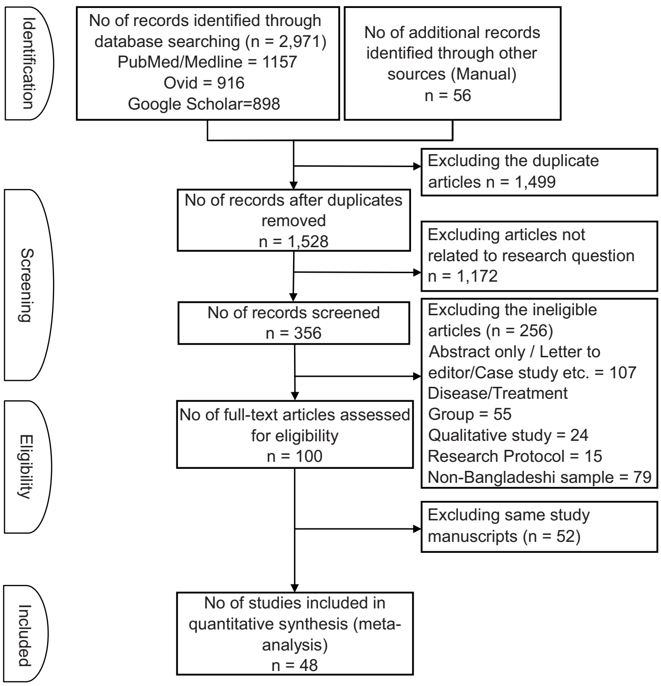

Fig. 1. Literature search and exclusion process of retrieved articles for data analysis

size by sex there was no significant difference in average LBW between boys and girls (SD, −0.53; 95% CI, −1.63–0.59). A similar pattern, i.e., no difference between sexes, was observed for birth weight (SD, 0.71; 95% CI, −0.43–1.83).

There are 8 divisions in Bangladesh and 48 studies were conducted in 7 divisions except Barisal division. Almost half of the studies were conducted in Dhaka division and only one study was in Khulna division. The pooled prevalence of LBW was significantly higher in Rang-

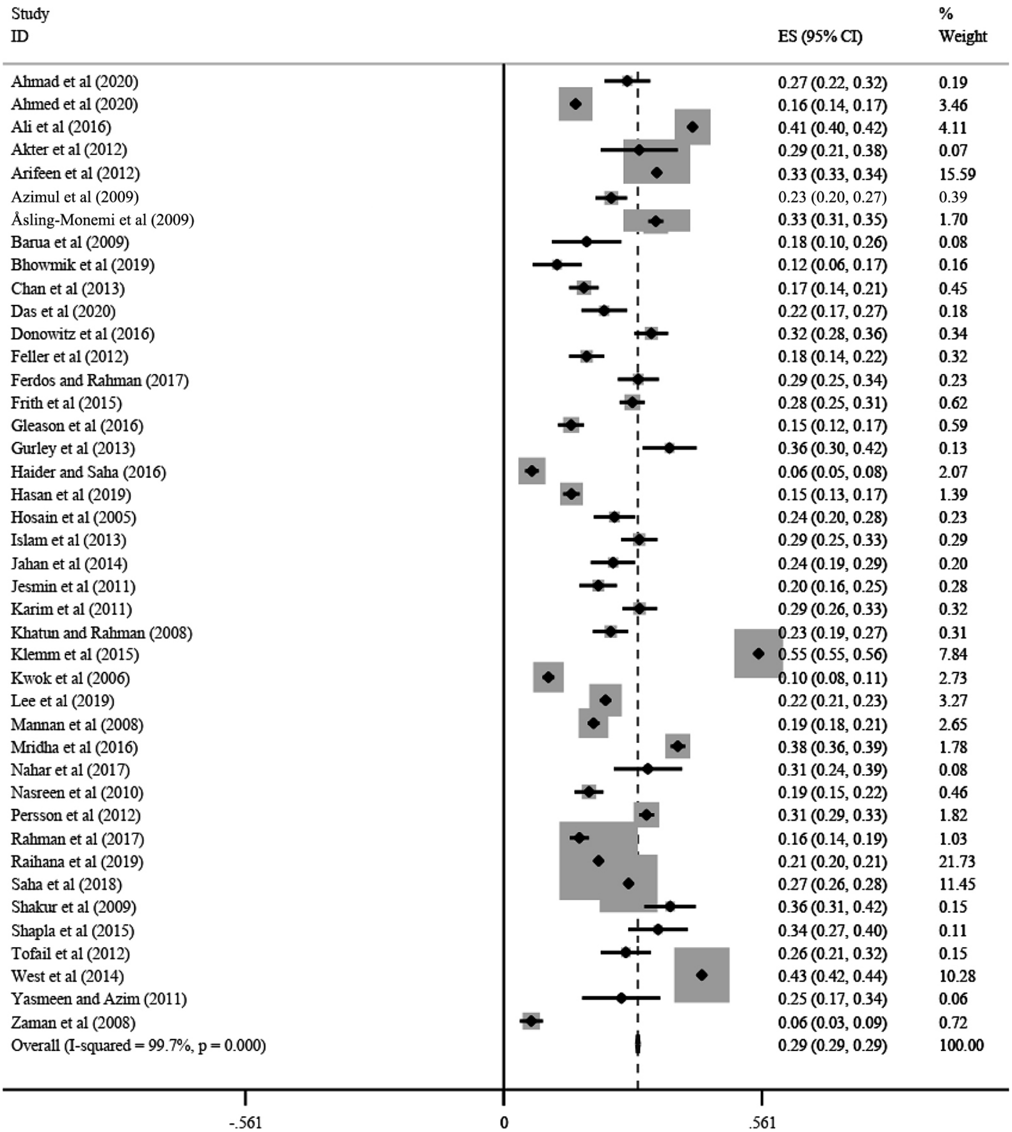

Fig. 2. Overall prevalence of low birth weight with effect size, 95%CI and percent weight

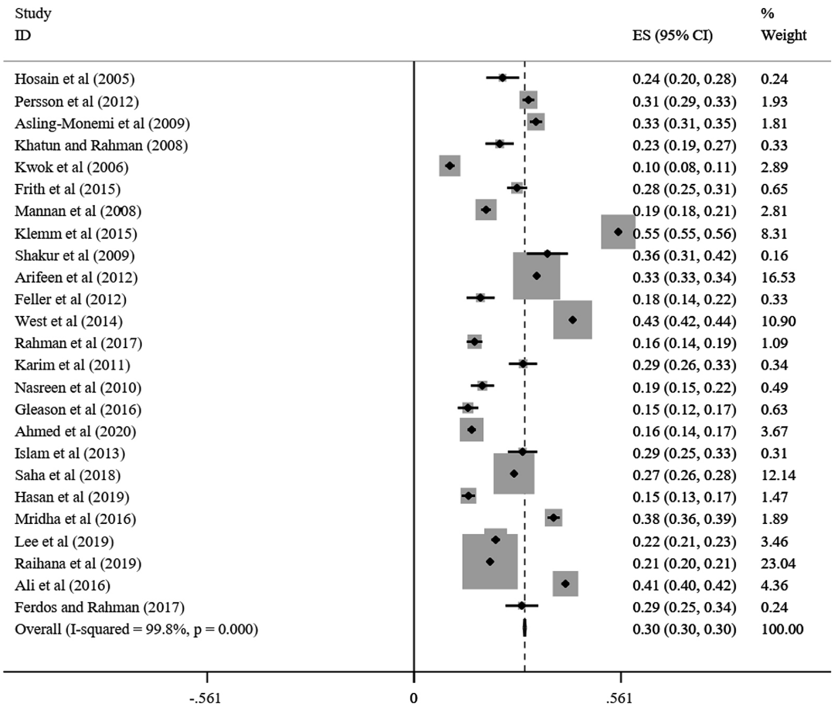

Fig. 3a. Prevalence of low birth weight in rural area with effect size, 95%CI and percent weight

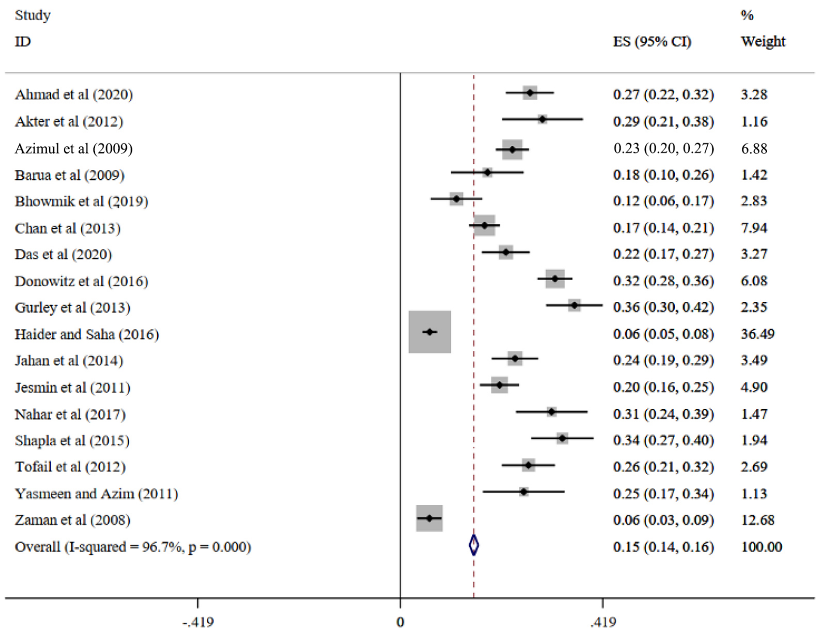

Fig. 3b. Prevalence of low birth weight in urban area with effect size, 95%CI and percent weight

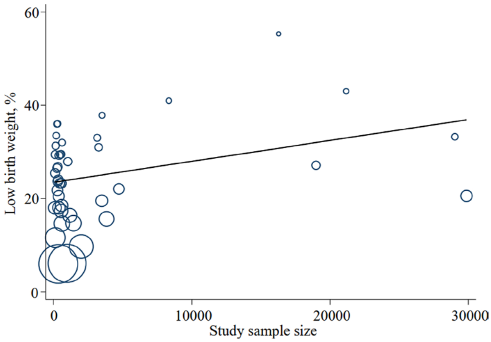

Fig. 4a. Bubble plot for meta-regression of LBW against study sample size

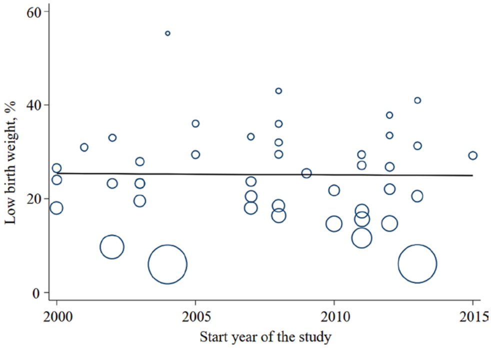

Fig. 4b. Bubble plot for meta-regression of LBW against year of the study

pur division (47.4; 95% CI: 46.9–47.9) compared to other 6 divisions ($p<0.01$) (Supplementary table 3).

A time-trend analysis showed that birth weight did not increase and the pooled prevalence of LBW did not significantly decrease by year (both $p>0.05$; Supplementary Figures 4a and 4b).

Discussion

Birth weight is a crucial indicator of pregnancy health and predictor of the future health of a baby. In this meta-analysis, the pooled prevalence of LBW was estimated as 29.1%, similar to a WHO (2019) report, which estimated a national prevalence of LBW of 27.8%. A national low birth weight survey (NLBWS) in Bangladesh reported that the mean birth weight is 2.9 kg and prevalence of LBW is 22.6% (NLBWS 2015). This review result is also higher than LBW prevalence estimates from Asian, African and European countries and globally (Mahumud et al. 2017; Endalamaw et al. 2018; Sharifi et al. 2018; Blencowe et al. 2019; Shokri et al. 2020).

Methodological variation could contribute to some extent to the differences in our LBW prevalence estimates compared to prior studies. In this meta-analysis, studies measured birth weight with a precision scale within 72 hours of birth. In contrast, BDHS (2011; 2014) data mostly reported on mother perception such as "very small" or "smaller than average", which has been shown to underestimate LBW.

Existing evidence on the causes of LBW suggest possible reasons for high rates of LBW and lack of improvement longitudinally in Bangladesh, as well as possible targets for intervention to increase birth weights. Studies in Bangladesh and India found that women's empowerment, measured with the women's empowerment index (WEI), is inversely associated with LBW (Sharma and Kader 2013; Duggal 2015; Shome et al. 2018; Kabir et al. 2020). Antenatal care (ANC) is associated with lower risk of LBW, based on studies in Bangladesh, Nepal and Ethiopia (Murphy et al. 2001; Demelash et al. 2015; Khan et al. 2018). Nutritional supplements during pregnancy can significantly reduce LBW (West et al. 2014). Mothers who delivered a baby at home tend to have higher prevalence of LBW compared to facility delivery (Biswas et al. 2008; Jha et al. 2009; Khan et al. 2018). In rural Bangladesh, 90% of births occurred at home (Klemm et al. 2015). LBW is also associated with maternal age (Kirchweger et al. 2018), BMI and height: young women (<20 years old) are 2.3 times more likely to give birth to infants with LBW compared to their older counterparts; underweight women (BMI<18.5 kg/m^2) are 2.43 fold more likely to have a LBW baby compared to mothers with BMI >18.5 kg/m^2; and short-statured mothers (<152 cm) have increased LBW risk compared to women >160 cm (Britto et al. 2013). Inadequate weight gain during pregnancy is also associated with IUGR. In Bangladesh, 27.5–58.7% women become pregnant below 20 years of age, 40% of women have BMI <18.5 kg/m^2 and 52% of women have height <150 cm (Klemm et al. 2008; West et al. 2014; Klemm et al. 2015). Finally, mean gestational weight gain at 3rd trimester in Bangladesh is 5–6 kg, which is lower than recommended weight gain and a known cause of LBW (Frederick et al. 2008; Nahar et al. 2019; Akter et al. 2012; Hasan et al. 2019).

The pooled prevalence of LBW was shown by division and compared with BDHS (2014) data. There was only ~5% variation of LBW prevalence between BDHS reported values and the results of this meta-analysis in Rajshahi, Dhaka, Chittagong and Mymensingh divisions, however, in Rangpur division the pooled prevalence of LBW (47.4%) was more than 2-fold higher than BDHS reported values in 2014 (22.7%). In Khulna division, the prevalence of LBW (29.4%) was also higher than the BDHS value (16.6%). Three big studies were conducted in rural areas of Gaibandha and Dinajpur districts of Rangpur division in 2004–2012, lending credibility to the estimate presented in this paper. Further, in these rural areas of Rangpur division, rate of delivery at home was more than 90% (West et al. 2014; Klemm et al. 2015; Mridha et al. 2016) and women's empowerment, wealth index and nutritional status were generally lower than in other divisions, suggesting LBW rate would be expected to be higher in Rangpur division compared to other divisions (BDHS 2014; NLBWS 2015).

In our meta-analysis, we compared birth weight and prevalence of LBW between boys and girls and did not find significant difference between sexes. We speculated that the variation by sex was not observed due to various sample size, study location and influential of SES and cultural conditions in different areas. This differs from the results of Klemm et al. (2015) in Bangladesh and other studies in Iran and Japan (Arima et al. 2017; Shokri et al. 2020), which reported differences in LBW prevalence by sex.

Due to growing urbanization and SES, LBW has declined in India, USA and Canada (Ananth and Wen 2002; Apte et al. 2019). In the present study, the time trend analysis showed that mean birth weight did not increase and the prevalence of LBW did not decrease significantly by year in Bangladesh. Similar result is reported by Endalamaw et al. (2018) in Ethiopia. However, opposite trend is noticed in Japan, a study on secular trend of birth weight found that the mean birth weight decreased and prevalence of LBW increased in between 1980–2010 (Takemoto et al. 2016). Our finding that the burden of LBW in Bangladesh was not decreased by year might be due to the persistently high rate of adolescent pregnancy, slow progress of quality improvements in health care services, and lack of improvements in maternal nutritional status before and during pregnancy and women's empowerment.

Strength and limitation

An extensive search strategy was done to capture of all relevant articles and included only studies where birth weight was measured within 72 hours of birth. Authors reviewed all articles extensively for relevance and to remove duplicate publications of the same data. Analytic methods were another also strength. We used random effects model, calculated effect size and stratified by potential modifying factors (child sex, location of residence and divisions). Authors excluded some articles as birth weight measurement time was not mentioned. Studies were not evenly distributed through the target time period and years with one or a small number of studies may not accurately represent larger time trends. There was no data from Barisal division.

Conclusion

This meta-analysis showed that the prevalence of LBW in Bangladesh remains high and has not decreased over time. Known risk factors and proven interventions need to be deployed to reduce this health burden. Regional and urban/rural differences identified here may help policy-makers to design interventions to reduce the incidence of low birth weight.

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The Authors' contribution

The idea was proposed by SS. SS, MTI and RKC contributed to overall co-ordination and overseeing of the process. SS and MTI contributed to administrative data collection, review and tabulation. SS, MTI and RKC designed analytical plan. SS analysed data and wrote original draft. RKC revised the manuscript and finally, all authors checked and approved the manuscript.

Conflict of interest

The authors declare that there is no conflict of interest.

Supplementary materials available on request from the authors due to privacy/ethical restrictions.

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