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Review

The prevalence of exclusive breastfeeding practice in the first six months of life and its associated factors in Nepal: A systematic review and meta-analysis

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ABSTRACT

Despite the global emphasis on breastfeeding, exclusive breastfeeding (EBF) in the first six months of life still lag behind the global recommendations in low- and middle-income countries, such as Nepal. This systematic review aims to determine the prevalence of EBF in the first six months of life and the associated factors determining EBF practices in Nepal. The databases PubMed/MEDLINE, Embase, Scopus, Web of Science, Cochrane Library, MIDIRS, DOAJ, and the NepJOL were searched for peer-reviewed literature published up to December 2021. The JBI quality appraisal checklist was used to assess the quality of studies. Analyses were performed by pooling together studies using the random-effect model, and the I^2 test was used to assess the heterogeneity of the included studies. A total of 340 records were found, out of which 59 full-text were screened. Finally, 28 studies met the inclusion criteria and were selected for analysis. The pooled prevalence of EBF was 43 % (95 % confidence interval: 34–53). The odds ratio for the type of delivery was 1.59 (1.24–2.05), for ethnic minority groups 1.33 (1.02–1.75) and for first-birth order 1.89 (1.33–2.67). We found a lower prevalence of exclusive breastfeeding practice in Nepal compared to the national target. Multifaceted, effective, evidence-based interventions would encourage individuals in the exclusive breastfeeding journey. Incorporating the BEF counselling component into Nepal's existing maternal health counselling package may help promote exclusive breastfeeding practice. Further research to explore the reasons for the suboptimal level of EBF practice would help develop the targeted interventions pragmatically.

Introduction

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend exclusive breastfeeding (EBF) in the first six months of life, i.e. feeding infants only breast milk for the first six months of life without any additional food or drinks, including water [1]. Breast milk is the best source of nutrition for a newborn [1,2]. Exclusive breastfeeding in the first six months of a child's life is critical for infant survival and reducing the risk of several infectious diseases [3]. Breastfed children have at least a six times greater chance of survival in the early months than non-breastfed infants [1,2,4]. Breastfeeding improves not only a child's growth but also improves the brain development of infants [5]. Infants who are not breastfed are around three to four times more likely to die than those who had EBF practices [2,6–9]. However, exclusive breastfeeding practice varies widely across regions and between countries. Globally, 44 % of babies are breastfed exclusively, ranging from 26 % in North America to 57 % in South Asia but the WHO expects every member country to achieve an EBF for the first six months up to at least 70 % by the end of 2030 [10].

The prevalence of EBF for the first six months of life is higher in low- and middle-income countries (LMICs) than in high-income countries. However, EBF practice still lags behind the WHO feeding recommendations [11]. According to a survey conducted in 2019, 62 % of babies are breastfed in Nepal, a LMIC, which was higher than in the South Asia region [10]. While comparing this by province, it ranged between 51 % in Bagmati province to 70 % in Madhesh province [12]. Evidence shows

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that a higher proportion of babies are breastfed within the first month, which gradually declines in the exclusive breastfeeding duration [10,13]. The low prevalence of EBF in most countries is attributed to various maternal and child-related factors such as the place of residence, marketing of infant formula milk, number of births and space between children, mother's age and level of education, mother working outside of the home, lack of husband's support, access to mass media and antenatal breastfeeding counselling [14–20]. Likewise, social support was also a positive predictor of breastfeeding practices [20–22].

Several studies in Nepal have examined the prevalence of EBF practices and the factors influencing EBF [23–25]. However, to date, no systematic review or meta-analysis has been conducted to determine the prevalence of EBF practice and the key factors that determine breastfeeding practices. Therefore, this review and meta-analysis aimed to assess the prevalence of EBF and identify the factors determining EBF in Nepal. The review findings would help develop targeted interventions to improve breastfeeding practices among Nepalese breastfeeding mothers and pregnant women.

Materials and methods

This systematic review and meta-analysis was guided by the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) recommendations [26] with the registration of the protocol with PROSPERO International Prospective Register of Systematic Reviews (CRD42020182870).

Search strategy

We searched PubMed/MEDLINE, Embase, Scopus, Web of Science, the Cochrane Library, Maternity & Infant Care Database (MIDIRS), Directory of Open Access Journals (DOAJ), and the Nepal Journals Online (NepJOL) for papers published from inception to December 2021. The search terms comprised combinations of MeSH terms using keywords such as breastfeeding, exclusive breastfeeding, prevalence, factors, determinants, and Nepal. Supplementary Table 1 provides the full search strategies for each database. Furthermore, the reference list of included studies was assessed to obtain further relevant studies.

Eligibility criteria

Eligible studies included in this review had to fulfil the following criteria: (1) studies in which mothers exclusively breastfed their infant up to six months of age; (2) studies that reported estimates of (or sufficient information to derive) the prevalence of EBF; (3) studies in which infants were aged more than six months; and (4) studies published in peer-reviewed journals and conducted in Nepal. Duplicate studies, case reports, conference reports, commentaries, short communications, and letters to editors were excluded from the review.

Quality appraisal

The quality of studies included in the systematic review and meta-analysis was assessed using the Joanna Briggs Institute (JBI) quality appraisal instrument for prevalence studies [27]. The appraisal checklist included the following parameters covering domains related to sampling, outcome assessment, statistical analysis, and response rate. Each item was scored one if the response was 'Yes' and scored zero if the response was 'No' or 'Unclear'. As in the previous review [28], studies with eight or more 'Yes' responses were rated as 'high' quality, four to seven as 'moderate' and three or below as 'low' quality. Two reviewers independently evaluated the quality of the studies.

The quality assessment showed that eight studies scored as high methodological quality [9,29–35], followed by fourteen studies with moderate [25,36–48], and six studies with low methodological quality [23,24,49–52] (Table 1). The presence of publication bias was checked by using funnel plot visualisation.

Data extraction

Following the database searches, the identified citations were collated and uploaded into EndNote, and duplicate records were removed. The remaining citations were imported into Rayyan systematic reviews web application [53] for screening and selection. Two reviewers independently screened titles and abstracts.

Data were extracted by two researchers independently after initially piloting five studies with a pre-labelled excel spreadsheet. Two other reviewers cross-checked the extracted data, and any discrepancies were resolved through discussion. Data extraction included: author(s), publication year, year of the study, the provinces and districts where the study was conducted, study design, sample size, EBF reporting methods and instrument, the prevalence of EBF practices and its determinants.

Data synthesis and analysis

A random-effects model was used to pool proportion (prevalence rate) across studies with a 95 % confidence interval (CI). In accordance with the existing recommendations, heterogeneity between studies was examined using Q- and I^2 statistics, with I^2 values of 25 %, 50 % and 75 % being considered as low, moderate and high levels of heterogeneity [54]. A forest plot was used to assess the presence of heterogeneity visually. We also conducted subgroup and sensitivity analyses to evaluate the possible source of heterogeneity. Sub-group analyses were performed by study design, mother's mean age, study locations (provincial and ecological regions), and sample size (<100, 100–200, 200–500, >500).

Pooled odds ratio (OR) values using the Mantel-Haenszel method were calculated to see the strength of the association between EBF and its risk factors. We chose to use adjusted ORs preferentially if these data were available. In the quantitative analysis, we included risk factors with (adjusted) ORs that were reported in at least two studies. We summarised risk factors for which ORs were unavailable using a narrative synthesis. The level of significance was set at $p < 0.05$. All analyses were performed in R statistical software (version 4.0.2) using meta-package [55].

We assessed the risk of publication bias by visual inspection of funnel plots for each analysis and the Egger test [56]. Asymmetry of funnel plot and a p-value of <0.05 was considered indicative of statistically significant publication bias [56].

Results

Search outcomes

The search of electronic databases identified 340 original records. After screening titles and abstracts and removing duplicates, the full texts of 59 studies were retrieved and assessed, and finally, 28 studies were included in this review. Thirty-one studies were excluded after full-text screening as they did not meet the inclusion criteria; 20 did not report prevalence and remaining were either not conducted in Nepal or were qualitative studies (Fig. 1).

Characteristics of included studies

A total of 10,031 participants were included in 28 studies. The studies were conducted between 2000 and 2020, with a majority of the studies (18 out of 28) conducted between 2016 and 2020. Three studies did not mention the year of study [31,41,49]. Eight studies were conducted in the Kathmandu district, followed by six studies in multiple (more than one) districts, two each in Bhaktapur, Banke, Chitwan, and Kaski districts, and one each in six districts, respectively. Regarding ecological regions, around two-thirds of studies (n = 18) were

Table 1
Characteristics of studies included (N = 28).

Author, year	Study conducted districts; year; setting	Study design	Study participants	Age of mothers, mean, (SD)	Sample size	EBF Measurement tool	Prevalence of EBF (6 months)	Quality rating of the studies (risk of bias)
Adhikari 2014	Kathmandu; July-Sept 2014; Health facility	Cross-sectional	Mothers with children aged 6 to 12 months who came for vaccination	26.5 (3.8)	323	Self-reported	49.5 % (n = 160)	High
Adhikari & Subedi 2013	Kathmandu; NR; Health facility	Cross-sectional	Mothers with children aged 6–12 months attending maternal and child health clinic	NR	100	Self-reported	34 % (n = 34)	Low
Ban & Rajbanshi, 2016	Jhapa; Aug-Sept 2013; Community	Cross-sectional	Mothers with children aged 6 to 23 months	23.9 (4.2)	132	Self-reported	49.2 % (n = 65)	Low
Basnet, 2016	Lalitpur; 2008–2009; Community	Cross-sectional	NR	NR	62	WHO infant and young child feeding practices monitoring tool	61.3 % (n = 38)	Moderate
Basnet et al, 2020	Kathmandu; Oct 2015-Aug 2017; Health facility	Cross-sectional	Mothers with children aged 6 to 24 months	29.9 (3.7)	110	Self-reported	16.3 % (n = 18)	Moderate
Benedict et al, 2018	National; Jan 2015; Health facility	Cross-sectional	Mother with less than one year old child	23.8 (4.3)	1,978	Self-reported	66.1 % (n = 1318)	Moderate
Bhandari et al, 2019	Kavre & Kathmandu; Dec 2017 to June 2018; Health facility	Cross-sectional	Mothers with a child below five years old	30.3 (3.7)	93	Self-reported	11 % (n = 10)	Moderate
Bhandari et al, 2019	21 districts; May-Jul 2013; Community	Cross-sectional	Mothers with a child below five years old	24.4 (5.4)	458	WHO infant and young child feeding practices monitoring tool	57.2 % (n = 262)	High
Bhandari & Prajapati, 2018	Kavre; Nov-Dec 2017; Community	Cross-sectional	Mothers with children aged 6 to 12 months old	NR	218	Self-reported	75.7 % (n = 165)	Moderate
Bhatta & Basnet, 2019	Kathmandu; Aug 2017 to Jan 2018; Health facility	Prospective longitudinal	All children attending at the immunisation clinic	27.4 (3.8)	103	Self-reported	23 % (n = 24)	High
Chapagain, 2013	Kathmandu; Jan 2016; Health facility	Cross-sectional	Mothers of 6–24 months children attending hospital	24.9 (4.1)	1100	NR	33.1 % (n = 367)	High
Dharel et al, 2020	Dhankuta, Jhapa and Banke; Dec 2017 to May 2018; Health facility	Cross-sectional	Mothers with children aged 6 to 18 months old	25.4 (4.1)	574	NR	23.2 % (n = 132)	Moderate
Gautam & Yadav, 2018	Baglung; NR; Community	Cross-sectional	Mothers with children less than two years old	NR	206	Self-reported	34.5 % (n = 71)	High
Gurung et al, 2018	Kaski; June-Jul 2017; Community	Cross-sectional	Women of reproductive age group	NR	140	Self-reported	76.4 % (n = 107)	Low
Henjum et al, 2016	Bhaktapur; Jan-Oct 2014; Community	Cross-sectional	Mothers with children age less than one year	NR	485	Self-reported	16.4 % (n = 80)	High
Khanal et al., 2015	Rupandehi; Jan-Oct 2–014; Community	Cohort study	Mothers who have a single child aged one month to six months	24 (4.6)	619	Self-reported	81.6 % (n = 505)	High
Kulkarni et al, 2020	16 districts of Suaahara project; 2012; Community	Cross-sectional	Mother of children aged up to 23 months	NR	385	Self-reported	49.3 % (n = 190)	High
Luitel et al., 2020	Chitwan; Mar-April 2019; Community	Cross-sectional	Mothers with children aged 6 to 59 months	25.9 (7)	77	Self-reported	50.6 % (n = 39)	Moderate
Manandhar et al., 2004	Kathmandu; May to Dec 2003 and Dec 2004; Health facility	Cohort study	Mothers with healthy term new-born baby	NR	81	NR	49 % (n = 40)	Moderate
Parajuli et al., 2017	Banke; Aug-Dec 2014; Health facility	Cross-sectional	Mothers with children aged 6 to 12 months	24.9 (4.1)	208	Self-reported	23 % (n = 48)	Low
Paudel & Parajuli, 2018	Kathmandu; Aug-Sept 2017; Health facility	Cross-sectional	Mothers with children aged less than two years old	25.1 (5.6)	96	Self-reported	39.6 % (n = 38)	Low

(*continued on next page*)

Table 1 (*continued*)

Author, year	Study conducted districts; year; setting	Study design	Study participants	Age of mothers, mean, (SD)	Sample size	EBF Measurement tool	Prevalence of EBF (6 months)	Quality rating of the studies (risk of bias)
Paudel et al., 2017	Chitwan; NR; Health facility	Cross-sectional	Mothers with children less than two years old	NR	130	Self-reported	20.8 % (n = 27)	Moderate
Pyakurel et al., 2018	Banke; Jan-Aug 2016; Health facility	Cross-sectional	Mothers with less than one year child	NR	19	Self-reported	83.5 % (n = 4)	Low
Sharma & Kafle, 2020	Kaski; Nov 2017 to Feb 2018; Community	Cross-sectional	Mothers with children aged 6 to 24 months	24.7 (5.3)	400	Self-reported	51 % (n = 202)	Moderate
Sharma & Khadka, 2019	Kathmandu; Jan-Feb 2015; Garment factory	Cross-sectional	Mothers with less than two years child	NR	50	Self-reported	34 % (n = 17)	Moderate
Shrestha et al., 2017	Lamjung, Tanahun and Gorkha; April-May 2015; Community	Cross-sectional	Mother with less than two years child	NR	1298	Self-reported	67.4 % (n = 875)	High
Subedi et al., 2012	Makawanpur; Aug-Sept 2010; Community	Cross-sectional	Mothers with children < 2 years old	22.8 (5.3)	261	Self-reported	81.6 % (n = 213)	Moderate
Ulak et al., 2012	Bhaktapur; Aug-Dec 2007; Health facility	Cross-sectional	Mothers with children aged nine months	NR	325	Self-reported	9 % (n = 29)	Moderate

NR: not reported.

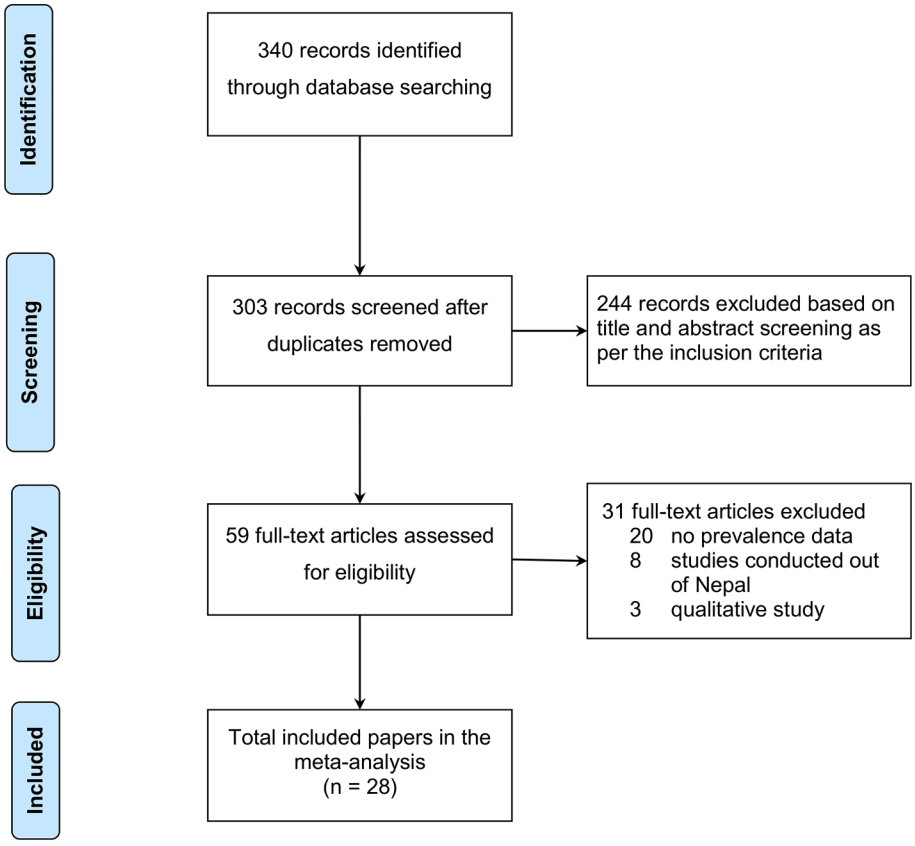

Fig. 1. PRISMA flow diagram illustrating the process of search and selection of studies in the present systematic review and meta-analysis.

conducted in the hilly region, followed by *Terai* (n = 6) and four in both regions [9,34,44,45].

Most of the studies (25 out of 28) used a cross-sectional design followed by three cohort studies [29,33,40]. The sample size of studies varied between 62 [36] and 1,978 subjects [44]. All study participants were younger mothers with mean age ranged from 22.8 years [47] to 30.3 years [38]. Self-reporting was the most common tool used to assess EBF (n = 23), followed by two studies that used the WHO infant and young child feeding practice monitoring tool [9,36].

Prevalence of EBF

The pooled prevalence of EBF in Nepal was computed to be 43 % (95 % CI: 35–52), and the observed heterogeneity was significant ($I^2 = 99$ %, $p < 0.001$) (Fig. 2). The prevalence rate by the methodological quality of studies did not change and confirmed the stability of the results (Supplementary material Fig. 1).

Table 2 describes the results of the subgroup analysis of the EBF prevalence. According to the study districts, the highest prevalence of EBF was observed in Makawanpur and Rupandehi districts (81.6 %). In contrast, the lowest rate was reported in Banke (22.9 %) and Bhaktapur (12.5 %) districts. However, EBF practices at the provincial level were found to be highly varied, from 37.7 % in Bagmati to 67.6 %in Lumbini province. The prevalence rate of EBF did not change by ecological regions, showing an almost equal rate in Hill and Terai regions (42.4 % vs 41.5 %). The prevalence of EBF in studies conducted in the community setting had a higher rate (57.8 %), whereas health facility-based studies had a lower prevalence rate (30.1 %). The pooled prevalence rate was higher among younger mothers (20 to 24-year-olds; 70.1 %), and older mothers (29 to 32 years) had the lowest prevalence (13.4 %).

Determinants of exclusive breastfeeding practice

Table 3 showed that the association between key risk factors and EBF practices. Types of delivery (OR = 1.59; 1.24–2.05), ethnic minority groups (OR = 1.33; 1.02–1.75), and first-birth order (OR = 1.89; 1.33–2.67) were found significant predictors for EBF practices. Other predictors such as lack of milk secretion, infant crying/hungry and insufficient milk [29,49,52], parents' level of education [39,50], sex of child [50], mother's age [36,37], busy work schedule [38], mother and infant sickness [29,37,52], types of family [37], parity of childbirth [37], infant sickness [29], knowledge about the duration of EBF [23,30], and being a working mother [38,52], and mother's knowledge regarding the provision of breastfeeding facilities for nursing mothers in the office [42] were found significant impacting for the EBF practices.

Publication bias

The publication bias was investigated using Egger's linear regression test and visual inspection of the funnel plot (Fig. 3). The funnel plot appeared to be asymmetric; however, Egger's linear regression test indicated that the funnel plot asymmetry was not statistically significant ($p = 0.32$).

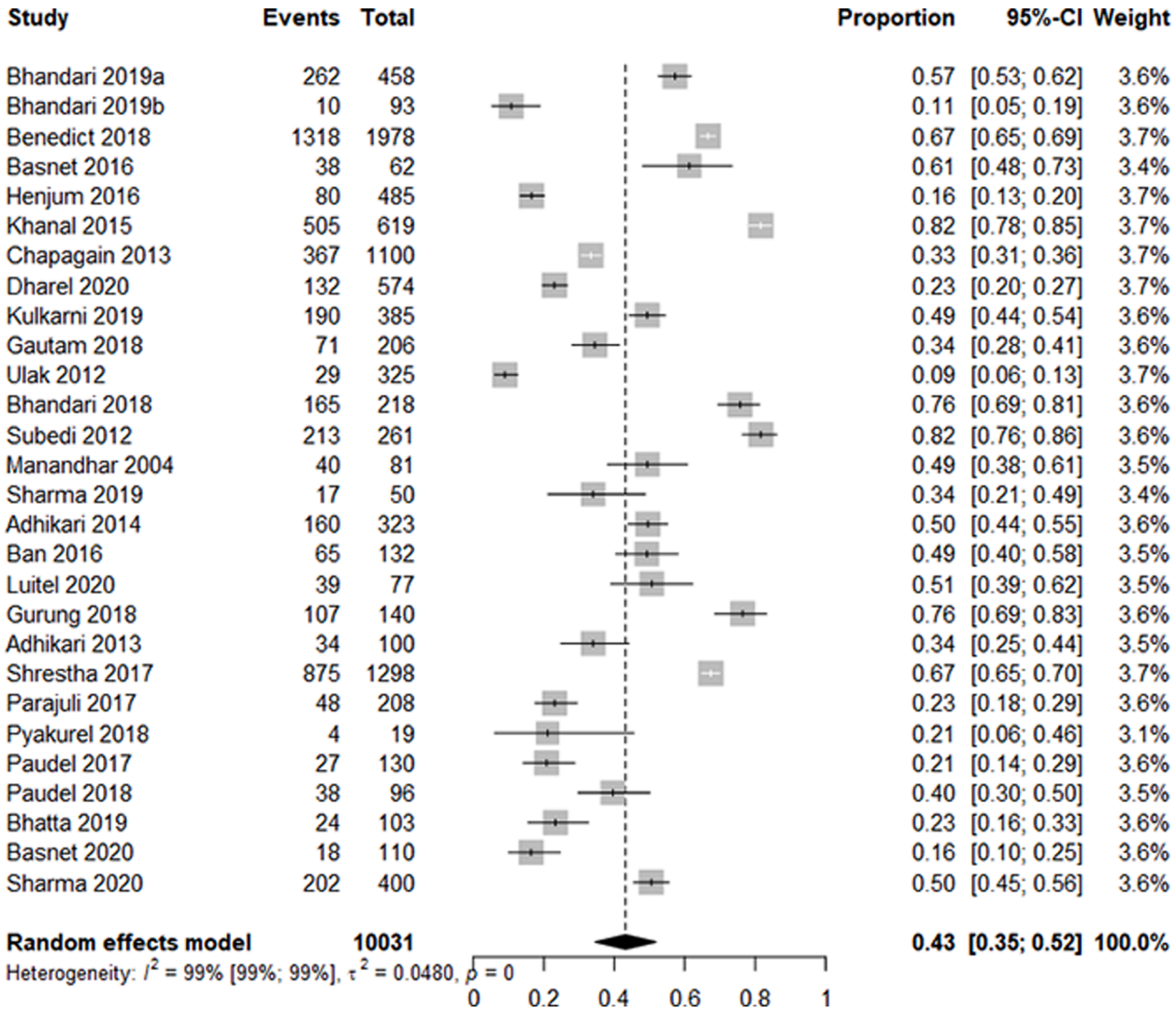

Fig. 2. Pooled prevalence of EBF in Nepal.

Table 2
Subgroup and sensitivity Analysis.

Variables	No. of studies	Prevalence, % (95 % CI)	Heterogeneity	
			I^2 (%)	*P-Value*
Study location (districts)				
Kathmandu	8	34.8 (25.1 – 44.5)	90.2	<0.0001
Multiple districts	5	41.2 (12.1–71.2)	99.3	
Kaski	2	58.9 (54.9 – 63.0)	97.2	
Bhaktapur	2	12.5 (10.2 – 14.7)	90.7	
Chitwan	2	29.2 (23.2 – 35.1)	94.9	
Banke	2	22.9 (17.4 – 28.4)	0.0	
Province				
Bagmati	16	37.7 (25.9–49.6)	98.7	<0.0001
Gandaki	4	57.2 (27.8 – 86.7)	97.6	
Lumbini	3	67.6 (64.9–70.3)	99.4	
Ecological regions				
Hill	18	42.4 (30.8–53.9)	99.1	<0.001
Terai	6	41.5 (15.8 – 67.1)	99.0	
Study setting				
Health facility	14	30.1 (20.4–39.7)	99.0	<0.001
Community	13	57.8 (46.2–69.5)	98.9	
Study design				
Cross-sectional	24	42.2 (41.1–43.3)	98.8	<0.0001
Cohort study	4	49.6 (47.5–51.7)	99.6	
Mean age of mother (years)				
20–24 years	4	70.1 (45.9–94.3)	97.2	<0.0001
25–28 years	9	38.8 (28.3–49.4)	96.6	
29–32 years	2	13.4 (8.6–17.9)	27.7	
Sample size				
<100	3	48.8 (15.0–82.7)	77.8	0.31
100–200	9	36.9 (21.9–51.9)	96.1	
200–500	9	39.0 (18.1–59.9)	99.3	
>500	7	54.1 (35.1–73.1)	99.4	

CI: Confidence Interval.

Table 3
Odds ratios for the different determinants of EBF Practice.

Variables	N	Odds ratio (95 % CI)	Heterogeneity			
			tau^2	Q-value	I^2 (%)	p-value
Wealth quantile	10	1.04 (0.84–1.29)	0.27	35.76	74.8	0.000
Mother's job	6	0.84 (0.59–1.19)	0.074	8.40	40.5	0.135
Mother's education level	6	1.12 (0.74–1.69)	0.046	11.7	57.2	0.040
Type of delivery	5	1.59 (1.33–1.91)	0.000	3.88	0.00	0.423
Ethnic minority groups	5	1.33 (1.09–1.62)	0.007	4.70	14.8	0.320
Age at child	4	1.76 (0.77–4.05)	0.669	73.8	95.9	0.000
Had ANC visit	3	1.42 (0.99–2.05)	0.076	11.5	82.5	0.003
Being a young mother	3	0.73 (0.48–1.12)	0.047	2.94	32.1	0.229
First birth orders	2	1.89 (1.33–2.67)	0.000	0.72	0.00	0.397
Colostrum fed	2	1.91 (0.83–4.44)	0.00	0.15	0.00	0.700
Breastfeeding initiation within an hour	2	2.00 (0.94–4.27)	0.18	2.13	53.2	0.144
Had PNC visit	2	1.48 (0.56–3.93)	0.397	4.08	75.5	0.043

CI: confidence interval; N: number of studies.

Discussion

Prevalence of EBF

The aim of this study was to examine the prevalence of EBF in the first six months of life and identify the factors that influence EBF practice in Nepal. The pooled prevalence of EBF was 43 %, i.e. only around two in five women exclusively breastfed their infant for six months which was lower than previous estimates for Nepal. However, this finding is similar to the global prevalence of EBF (44 %) but lower than the South-Asia (57 %) region [10] and recent national surveys (62–66 %) [12,13,57]. The studies included in this analysis predominantly measured EBF using self-report, which may be open to response bias. The national level surveys used infant and young child feeding practices tools that could explain the discrepancies in the prevalence of EBF. However, the pooled prevalence rate of our study was higher than recent studies conducted in Nepal's neighbouring countries, India (28 %) [58] and China (37 %) [59].

Socio-cultural norms influence EBF practices [60]. Nepal is a multicultural country in South Asia which could explain the variation of EBF practices compared to Nepal's neighbouring countries and from international literature. Most of the studies were conducted in urban areas. Due to urbanisation, access to food supplements has increased in recent years, which may explain the lower prevalence of EBF practice in urban areas. Two districts (Makawanpur and Rupandehi) had a much higher prevalence than the overall pooled estimation. While studies conducted in the Bhaktapur district, which is close to the country's capital, had a much lower (8.9 – 16.5 %) EBF prevalence. However, Bhattacharjee et al. indicated that EBF for the first six months of life has increased annually across Nepal's districts between 2000 and 2018 [57]. A previous study [61] showed that mothers who lived in urban areas were more likely to be employed, and the likelihood of stopping breastfeeding is up to two times compared to women living in rural areas.

Similarly, the review found a higher prevalence of EBF among mothers aged 20–24 years and lower rates among mothers aged 29–32 years. This portrays that women with multiple roles, such as childcaring and professional workers, had a lower prevalence of EBF practice compared to unemployed women [62]. Furthermore, there may also be methodological issues as most published estimates are drawn from household surveys with self-reports that are prone to reporting bias [63].

Determinants of EBF practices in Nepal

EBF practice could be impacted by several interlinked underlying risk factors which vary from one community to another. The findings showed that women who gave birth vaginally were two times more likely to have exclusive breastfeeding. This finding is also supported by a recent mixed-methods systematic review from low- and middle-income countries that mothers who had caesarean section were unable to breastfeed infants because of more exhaustion and tiredness [64]. Nepal has observed a substantial increase in caesarean delivery over a decade. A recent study from Nepal reported around half (44.2 %) of the deliveries were conducted through caesarean section [65].

The findings showed that minority ethnic groups had around two times lower prevalence of EBF practice in the first six months of life in Nepali children than other so-called higher ethnic groups in Nepal. This finding is unique. Nepal is a multicultural, multi-ethnic, multilingual and multireligious country. Previous research showed that cultural relativities affirm that one culture has no absolute criteria for judging the activities of others and their different social norms and values that may impede exclusive breastfeeding [66]. There were significant disparities

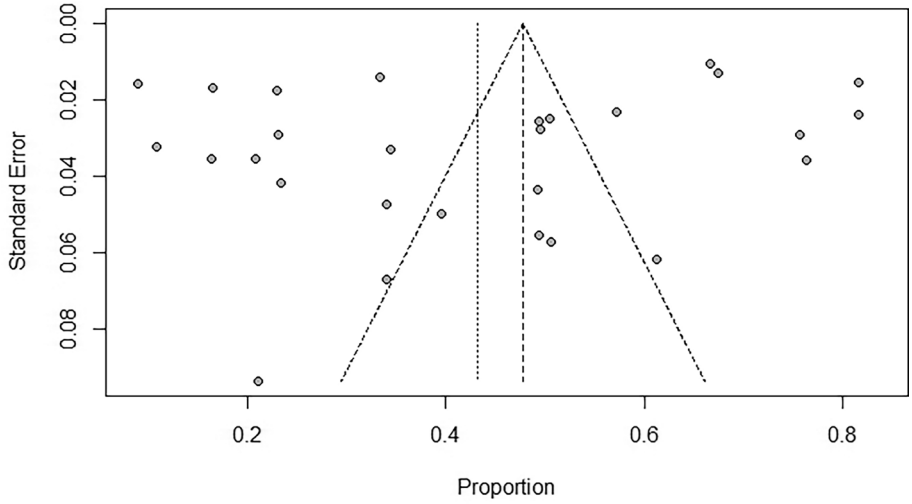

Fig. 3. Funnel plot for 28 studies included in the meta-analysis.

in almost all health indicators of ethnic minority women in Nepal, where access to antenatal care visits, the use of skilled birth attendants during deliveries and family planning services were also found to be lowest among the Janajati, Dalit and Terai/Madheshi women [67]. This could be the result of the lack of awareness and counselling regarding the benefits of EBF practice and could be improved by promoting the mother's education and counselling during antenatal and immunisation visits at the primary health care facility. However, Nepal's current maternal health service counselling package includes EBF advice.

Furthermore, health workers' and community health volunteers' counselling skills play an important role in addressing the breastfeeding problem and supporting EBF practice uptake [68]. Previous studies show that unsatisfactory experience negatively affected breastfeeding practices [69] and positive social support foster EBF practice [20]. Therefore, incorporating the EBF counselling component in the female community health volunteers' daily community activities would help to disseminate the benefits of EBF more effectively.

The first birth order of the infant was indicated as a high risk for early cessation of exclusive breastfeeding compared to higher birth order, consistent with an existing study conducted in Myanmar [70], Nigeria [71] and Ethiopia [61]. The possible reason may be that mothers tend to become more experienced in feeding their infants when the birth order increases. Literature also suggests that multiparous mothers produce colostrum and breast milk earlier than nulliparous ones, and those mothers can practice EBF more easily [72]. It is recommended that healthcare providers make sure that there is increased advocacy to increase access of mothers coming to immunisation clinics and postnatal care counselling on EBF counselling. Hence, there must be adequate context-specific counselling during the health facility visits, which is paramount to fostering EBF practices.

Strengths and limitations of the study

This review is the first attempt to synthesise the current evidence on the prevalence of EBF practice in the first six months of life in Nepalese children and the determinants of EBF practice. The search of various databases, sub-group analysis and sensitivity analyses were among the strengths of this review. The review included studies that had mentioned the odds ratio, either unadjusted or adjusted, to examine the association between the EBF practices and its predictors. Still, adjusted values were preferred for pooled estimation. However, this review had some important limitations. First, the methodological differences in the included studies may have led to a high, statistically significant heterogeneity. Second, there was severe heterogeneity of EBF prevalence in the included studies. Most of the studies included were observational cross-sectional studies. This may have contributed to statistically significant heterogeneity. Third, 21 out of 28 studies included in this review had a sample size less than or equal to 500. Stratified analysis by study year, sample size and other participant-level characteristics was conducted to explain this heterogeneity. Fourth, most studies were conducted in health facilities, not population-based. Therefore, the findings are not inclusive of the general population.

Conclusions

The findings of this systematic review and meta-analysis showed lower EBF prevalence compared to the national target in Nepal. Cessation of EBF was associated with types of delivery, an ethnic minority group, and first birth order. There should be a pragmatic support service provision through family or peers to follow the recommended practice of EBF for mothers from the ethnic minority community. Breastfeeding counselling during antenatal care and immunisation clinic visits should provide context-specific counselling to the mothers, which is paramount to fostering EBF practices. Furthermore, there should have pragmatic EBF content to address Nepal's unique socio-culture practices and social norms in the current maternal health service counselling package that would help address those underlying barriers to EBF practices in Nepal. Further research to explore the reasons for the suboptimal level of EBF practices would help develop the targeted interventions.

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CRediT authorship contribution statement

Sharada P. Wasti: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing. **Ayushka Shrestha:** Data curation, Writing – review & editing. **Pushpa Dhakal:** Data curation, Writing – review & editing. **Vijay S. GC:** Conceptualization, Methodology, Investigation, Formal analysis, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability statement:

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.srhc.2023.100863.

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