

What works to protect, promote and support breastfeeding on a large scale: A review of reviews

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Abstract

Globally women continue to face substantial barriers to breastfeeding. The 2016 Lancet Breastfeeding Series identified key barriers and reviewed effective interventions that address them. The present study updates the evidence base since 2016 using a review of reviews approach. Searches were implemented using the Epistomenikos database. One hundred and fifteen reviews of interventions were identified and assessed for quality and risk of bias. Over half of reviews (53%) were high- or moderate quality, with the remaining low or critically low quality due to weaknesses in assessment of bias. A large portion of studies addressed high-income and upper-middle income settings, (41%), and a majority (63%) addressed health systems, followed by community and family settings (39%). Findings from reviews continue to strengthen the evidence base for effective interventions that improve breastfeeding outcomes across all levels of the social-ecological model, including supportive workplace policies; implementation of the Baby-Friendly Hospital Initiative, skin to skin care, kangaroo mother care, and cup feeding in health settings; and the importance of continuity of care and support in community and family settings, via home visits delivered by CHWs, supported by fathers', grandmothers' and community involvement. Studies disproportionately focus on health systems in high income and upper-middle income settings. There is insufficient attention to policy and structural interventions, the workplace and there is a need for rigorous assessment of multilevel interventions. Evidence from the past 5 years demonstrates the need to build on well-established knowledge to scale up breastfeeding protection, promotion and support programmes.

KEYWORDS

breastfeeding, breastfeeding promotion, breastfeeding support, community-based, programme components, systematic review

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1 | INTRODUCTION

Most women globally want to breastfeed but continue to face barriers that hinder their ability to do so as they desire (Pérez-Escamilla, 2020). Previous research has established that these barriers are pervasive and operate at numerous levels across the social-ecological model, ranging from structural to the individual levels (Pérez-Escamilla, 2020; Rollins et al., 2016). The wealth of literature on the social determinants of health (World Health Organization, 2018) suggests that the majority of health outcomes are shaped by social and structural determinants that may not be apparent by individual families who attempt to breastfeed. Therefore, what may be expected to be decisions made on the individual level are often shaped by broader historical and social, political and economic systems structures (Tomori et al., 2017).

There is a substantial and well-established literature addressing barriers to breastfeeding that target health systems, the workplace, and community or family settings, or a combination of these settings (Pérez-Escamilla, 2020; Rollins et al., 2016; Sinha et al., 2015). The 2016 Lancet Breastfeeding Series reviewed this literature in depth and found that interventions in these settings can substantially increase the prevalence, exclusivity and duration of breastfeeding in diverse settings. Rollins et al. (2016) also noted that studies that address a combination of settings were particularly effective. The authors observed that there was less attention to addressing workplace settings than healthcare, community and family settings, and few interventions focused on policies that shape the broader context of breastfeeding decisions, such as addressing the influence of industry. The present study evaluates interventions that address breastfeeding barriers in the last 5 years since this landmark review using a review of reviews approach. We investigate the quality of reviews, distribution of the studies across income settings and the social-ecological model, and summarize key findings from the literature.

2 | METHODS

We carried out a systematic review of reviews using the Epistemonikos database (Rada et al., 2020), which has been previously used to conduct reviews of reviews (Heidkamp et al., 2021), to identify reviews of breastfeeding interventions that address breastfeeding barriers and facilitators published in English between 2016 and 2021. The time period was selected to reflect updated literature since the 2016 Lancet Breastfeeding Series (Rollins et al., 2016). Five searches were conducted in July 2021 using select keywords from abstract or title corresponding with the levels of breastfeeding interventions across the social-ecological model as outlined by Rollins et al. (2016). The search strategy was developed in collaboration with a research librarian and reviewed by the authors (Table 1, Figure 1). Primary studies were excluded. There were no geographical restrictions but only reviews in English were included due to resource limitations (Table 2).

Key messages

- Women globally continue to face barriers to breastfeeding. This review assessed effective interventions that address these barriers in the past 5 years.
- Studies disproportionately focus on high income and upper-middle income settings, and on health systems, and on single settings.
- There is insufficient attention to policy and structural interventions, and there is a need for rigorous assessment of multilevel interventions.
- Research in the past 5 years strengthens the evidence base for effective breastfeeding interventions across all levels of the social-ecological model.
- There is an urgent need to implement interventions that combine established and effective measures to improve breastfeeding outcomes.

2.1 | Screening and data extraction

After the removal of duplicates, titles and abstracts were screened for eligibility by Natalie Busath under the close supervision of Cecilia Tomori and reviewed by the rest of the author team. Discrepancies about inclusion/exclusion were resolved by group consensus regarding studies evaluating the implementation and cost-effectiveness of interventions.

The remaining records were reviewed at full text to assess whether they met inclusion/exclusion criteria (Table 2, Figure 1). Data on authors, year of publication, number of articles related to breastfeeding included in the review, World Bank Income Classification (The World Bank, 2021) and setting(s) of interventions across the social-ecological model were systematically extracted by N. B. using a predesigned form agreed upon a priori by all authors (Table S1). C. T. reviewed 20% of the extractions and carried out additional spot checks to ensure consistency. Any questions or concerns were addressed collaboratively with the author team.

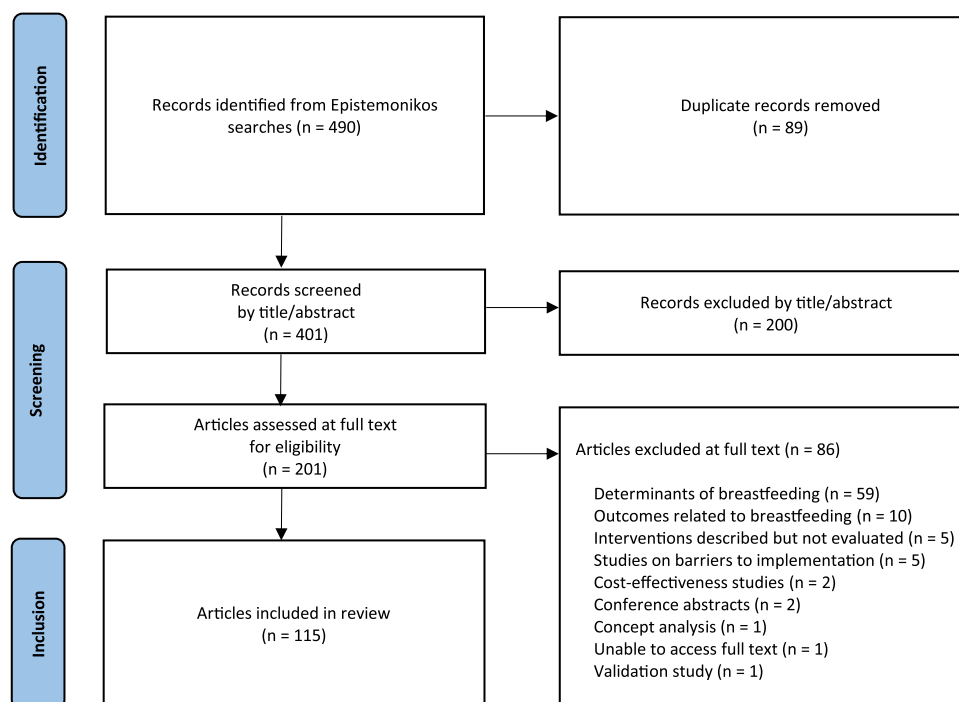
2.2 | Quality assessment

Reviews were assessed for quality and risk of bias using the AMSTAR 2 Critical Appraisal Tool (Shea et al., 2017) and assigned one of the following confidence ratings: (1) high, showing no critical weaknesses and 0–1 noncritical weaknesses; (2) moderate, showing no critical weaknesses and 2 noncritical weaknesses; (3) low, showing 1 critical weakness; or (4) critically low, showing 2 critical weaknesses.

N. B. applied the AMSTAR 2 rating system and C. T. reviewed the application of the tool. C. T. reviewed 20% of the ratings applied, with additional spot checks across each category. In the sample of studies reviewed jointly by two authors, there was

TABLE 1 Search strategy

Database	Search strategy	Result
Epistemonikos	('breast feeding' OR breastfeeding OR breastfed OR 'breast fed') AND	-
	• (barrier* OR facilitator* OR program* OR intervention*)	381
	• (behaviour AND chang*) OR (behaviour AND chang*) OR 'social marketing' OR 'social behaviour change communication' OR 'mass marketing' OR 'mass communication' OR SBCC)	16
	• ('evidence based policy' OR 'evidence-based policy' OR 'evidence based policies' OR 'evidence-based policies' OR 'evidence informed policy' OR 'evidence informed policies' OR 'maternity benefit' OR 'maternity benefits' OR 'WHO Code' OR 'international code of marketing of breast-milk substitutes' OR 'international code of marketing of breastmilk substitutes' OR structural)	10
	• ('rooming in' OR 'rooming-in' OR 'health care system' OR 'health care systems' OR 'Baby Friendly Hospital' OR 'Baby Friendly Hospitals' OR 'Baby-friendly hospital' OR 'Baby-friendly Hospitals' OR 'Baby Friendly Initiative' OR 'lactation counselling' OR 'lactation counselling' OR 'breastfeeding counselling' OR 'breast feeding counselling' OR 'breastfeeding counselling')	28
	• (work OR worksite* OR workplace* OR 'work site' OR 'work sites' OR job OR jobs OR jobsite* OR employment OR 'working women' OR 'working woman' OR 'maternal employment' OR 'formal economy' OR 'informal economy')	55
Total records		490

**FIGURE 1** PRISMA flow diagram. Adapted from: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: [10.1136/bmj.n71](https://doi.org/10.1136/bmj.n71)**TABLE 2** Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> Evaluates the effectiveness of an intervention on breastfeeding outcomes Full-text available in English language 	<ul style="list-style-type: none"> Focused on determinants of breastfeeding; no evaluation of interventions Measures indirect indicators of breastfeeding (e.g., self-efficacy, knowledge, attitudes, beliefs) Focused on theoretical development or measurement Cost-effectiveness studies

one instance where there was initial disagreement between N. B. and C. T. that was resolved in the final draft (Tiruneh et al., 2019). Any questions, concerns or uncertainties about the application were discussed in detail with C. T. and resolved in those discussions. Additional questions were brought to the author team and discussed and resolved collaboratively.

3 | RESULTS

A total of 490 records were identified, 89 of which were duplicates. Of the remaining 401 titles and abstracts screened, 201 were included and eligible for full-text review. Of these 201 articles, 86 were excluded after full-text reading for reasons outlined in Figure 1. The

remaining reviews ($n = 115$) evaluating breastfeeding interventions were included in the present review and were assessed for quality and risk of bias.

Over half (53%) of reviews had no critical weaknesses (Figure 2), with confidence ratings of high (45%) and moderate (8%). The remaining reviews had at least one critical weakness, with confidence ratings of low (23%) and critically low (24%). Responses by individual questions are shown in Figure 3.

Most common weaknesses on critical domains (items 2, 4, 7, 9, 11, 13 and 15) included lack of plan for assessing bias, insufficient assessment of bias, and lack of assessment of publication bias. Notably, 90% of reviews ($n = 103$) failed to investigate or report the funding sources for individual studies in the review. Interestingly, one review (Ashman et al., 2017) investigated funding sources as part of

AMSTAR 2 Confidence Ratings for Reviews of Breastfeeding Interventions ($n=115$)

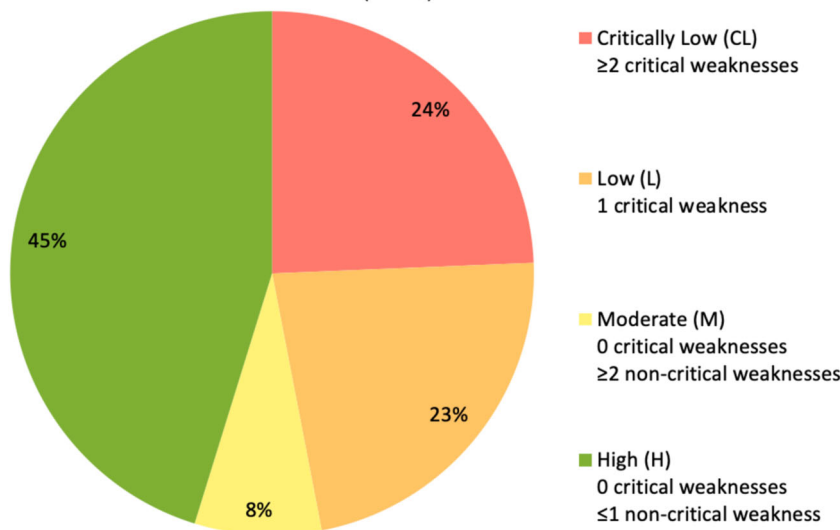


FIGURE 2 AMSTAR 2 confidence ratings for breastfeeding interventions ($n = 115$)

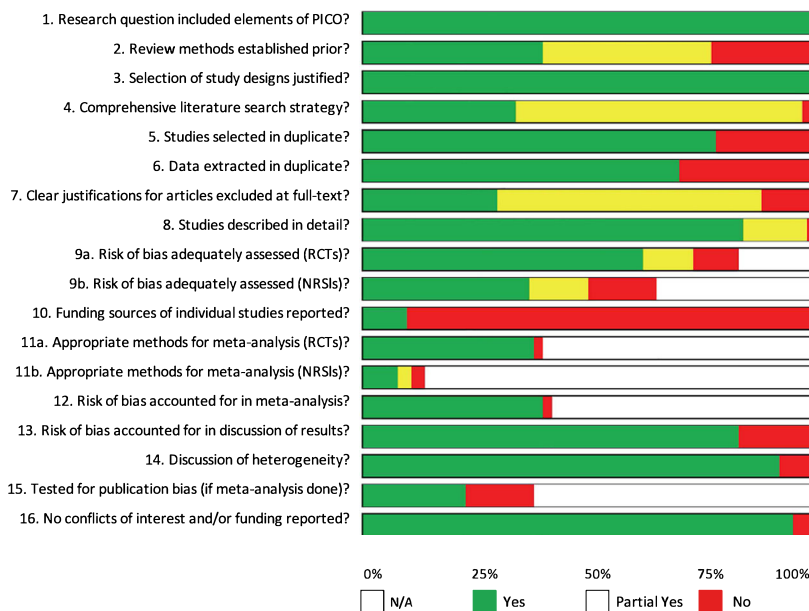


FIGURE 3 AMSTAR 2 critical appraisal of included systematic reviews of breastfeeding interventions ($n = 115$)

PICO = Population, Intervention, Control, Outcomes; RCT = Randomized controlled trials; NRSI = Non-randomized studies of interventions

its risk of bias assessment while another (Sinclair et al., 2018) explicitly stated that studies funded by a commercial milk formula company were excluded from the review to avoid risk of bias from conflicts of interest.

3.1 | Distribution of reviews across income levels

Reviews primarily addressed studies conducted in high and upper-middle income settings (40.9%, $n = 47$), or a combination of high-, middle-, and low-income countries (41.7%, $n = 48$). However, these comprehensive reviews were skewed towards higher-income settings. Similarly, less than one-fifth (17.4% or $n = 20$) of studies focused solely on low- and middle-income settings (Table S1).

3.2 | Distribution of reviews across the social-ecological model

Of the 115 reviews included, a majority (63%, $n = 72$) involved interventions conducted within health systems, followed by 39% ($n = 45$) within home or community settings, and 9% ($n = 10$) addressed workplace interventions. Only 8 (7%) reviewed addressed interventions with a structural component, such as policy changes, community mobilization, mass communication, or enhanced monitoring and enforcement of the International Code of Marketing of Breast-milk Substitutes. Most reviews were limited in focus to interventions conducted in one setting alone; but 21 (18%) reviews studied interventions involving multiple settings (e.g., health system interventions that involve home visits, engagement of family members, and community mobilization) (Table S1).

3.3 | Key findings from included reviews

Reviews addressing health systems primarily focus on hospital settings. There is consistent evidence that implementation of early skin-to-skin care (Karimi et al., 2020; Moore et al., 2016), kangaroo mother care (KMC) (Boundy et al., 2016; Mekonnen et al., 2019), rooming in (van Veenendaal et al., 2019), and cup feeding (Cartwright et al., 2017; Flint et al., 2016) improves breastfeeding outcomes such as early initiation, duration, and exclusivity for both pre-term and full-term infants. Additionally, there is consistent evidence that the implementation of the Baby Friendly Hospital Initiative (BFHI) is associated with better breastfeeding outcomes both within the hospital and in the community (Fair et al., 2021; Fallon et al., 2019; Feltner et al., 2018; Pérez-Escamilla et al., 2016; Wouk et al., 2017). Evidence certainty from studies assessing BFHI, however, is limited by study heterogeneity and risk of bias (Fair et al., 2021) (Table 3).

Most commonly, community-, family-, and individual-level interventions also involved elements of the health system that

extend beyond the hospital. For instance, health care providers and community health workers (CHWs) engaged in prenatal and postnatal breastfeeding education and counselling efforts and home visits. The most effective efforts spanned the prenatal and postnatal period (Feltner et al., 2018; Olufunlayo et al., 2019; Wouk et al., 2016) and engaged family members (Lassi et al., 2019; Wouk et al., 2017). Several reviews demonstrated the importance of engaging fathers (Abbass-Dick et al., 2019; Mahesh et al., 2018; Tadesse et al., 2018) and grandmothers (Martin et al., 2020; Negin et al., 2016) (Table 4).

Home visits were a highly effective mode of delivering pre- and postnatal education and lactation support with both trained health workers and CHW, across different settings (Tiruneh et al., 2019; Tol et al., 2020; Yonemoto et al., 2017). Prenatal visits that incorporate maternal mental health components improved exclusive breastfeeding (Tol et al., 2020). Postnatal home visits were associated with higher exclusive breastfeeding and longer breastfeeding duration (Tiruneh et al., 2019; Yonemoto et al., 2017), although further research is needed to determine the specific aspects of the most effective package (e.g., the frequency, timing and duration of the visits) (Yonemoto et al., 2017). Importantly, CHW bridged healthcare as well as community and family settings (Lassi et al., 2019), including in home visits (Tiruneh et al., 2019). CHW played a crucial role in building community engagement and delivering respectful and culturally appropriate care and support, which is particularly important in supporting historically marginalized communities (Ashman et al., 2017; Browne et al., 2018). Similarly, CHW played a pivotal role in establishing effective networks of support in complex situations, such as humanitarian emergencies (Dall'Oglio et al., 2020) (Table 5).

Comparatively few reviews address work settings. Paid maternity leave is a key policy with significant impacts on breastfeeding prevalence and duration, although disparities in access and utilization persist (Andres, 2016; Nandi et al., 2018). Upon returning from paid leave, a broader package of supportive workplace policies and practices that include lactation spaces and breaks for milk expression were most effective (Jiménez-Mérida et al., 2020; Tang et al., 2021) rather than just focusing on single policies. Research highlighted that broader organizational and interpersonal changes are necessary to achieve equitable working conditions for breastfeeding mothers (Vilar-Compte et al., 2021) (Table 6).

On an individual level, behaviour change-based interventions were moderately effective (Kassianos et al., 2019), and theory-based interventions using theories of self-efficacy or planned behaviour were more effective at improving exclusive breastfeeding (Chipojola et al., 2020). A growing area of research supports the use of digital health interventions at the individual level, in the form of SMS/text messaging, and other online formats (Ekambareshwar et al., 2021; Lau et al., 2016; Palmer et al., 2020), although with low certainty due to the quality of the studies (Table 7).

The limited number of multilevel interventions draw on a combination of multiple, previously established interventions to demonstrate effective ways to improve breastfeeding outcomes.

TABLE 3 AMSTAR 2 confidence ratings for reviews of breastfeeding interventions involving health systems (n = 72)

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9a	Item 9b	Item 10	Item 11a	Item 11b	Item 12	Item 13	Item 14	Item 15	Item 16	Individual	Health Systems	Workplace	Family/Community	Structural	Confidence Level
Mirshahi et al., 2021																			x					L
Chepkirui et al., 2020																			x					CL
Kassianos et al., 2019																			x	x				H
Lumbiganon et al., 2016																			x					H
Chutiyami et al., 2019																			x					CL
Chuisano & Anderson, 2020																			x					CL
Chen et al., 2017																			x					H
Habtewold et al., 2019																			x					H
Tsai & Doan, 2016																			x					CL
Karacam & Saglik, 2018																			x	x				L
Feltner et al., 2018																			x					H
Dall'Oglio et al., 2020																			x	x	x			H
Chetwynd et al., 2019																			x					L
Coca et al., 2018																			x					CL
Wouk et al., 2016																			x					H
Bohren et al., 2017																			x					H
Flint et al., 2016																			x					H
Jones et al., 2021																			x					H
Moore et al., 2016																			x					H
Meedya et al., 2017																			x					L
Chen et al., 2018																			x					CL
Rana et al., 2021																			x	x	x			M
Wong et al., 2021																			x					L
Lee et al., 2016																			x					H
Davie et al., 2020																			x					H
Sultan et al., 2020																			x					H
Ashman et al., 2017																			x	x	x			H
McKinney et al., 2016																			x					CL
Browne et al., 2018																			x	x				H
Balogun et al., 2017																			x					H
Van Veenendaal et al., 2019																			x					H
Segura-Pérez et al., 2021																			x	x	x			H
Lassi et al., 2020																			x	x				CL
Pérez-Escamilla et al., 2016																			x					L
Koplin et al., 2019																			x	x				CL
Sinha et al., 2017																			x	x				CL
Cartwright et al., 2017																			x	x				M
Skouteris et al., 2017																			x					M
Balogun et al., 2016																			x	x				H
Beake et al., 2017																			x					H
Kim et al., 2018																			x	x				L
Boss et al., 2021																			x					H
Wood et al., 2016																			x					CL
Olufunlayo et al., 2019																			x	x				H
Cordell & Elverson, 2020																			x	x				M
Brockway et al., 2017																			x	x				CL
Boundy et al., 2016																			x					L
Oliveira et al., 2017																			x	x				CL
Sandall et al., 2016																			x					H
Lange et al., 2020																			x	x				CL
Abbass-Dick et al., 2019																			x	x				H
Gómez et al., 2021																			x					CL
Patnode et al., 2016																			x					H
Fang et al., 2021																			x					L
Jaafar et al., 2016																			x					H
Tassanee & Parnnarat, 2017																			x					CL
McFadden et al., 2017																			x	x				H
Doerzbacher & Chang, 2019																			x					CL
Wouk et al., 2017																			x					M
DeNicola et al., 2020																			x					L
Howe-Heyman & Lutenbacher, 2016																			x					CL
Fotiou et al., 2018																			x					CL
Karimi et al., 2020																			x					L
Ng et al., 2019																			x					CL
Patel & Patel, 2016																			x	x				L
D'Haenens et al., 2019																			x					M
Mekonnen et al., 2019																			x					L
Fair et al., 2021																			x					H
Fallon et al., 2019																			x					H
Huda et al., 2021																			x					H
Hilditch et al., 2019																			x					CL
Deeney & Harris-Fry, 2020																			x	x	x			H

AMSTAR 2 Confidence Ratings

H High: 0 critical weaknesses, ≤1 non-critical weakness
M Moderate: 0 critical weaknesses, ≥2 non-critical weaknesses
L Low: 1 critical weakness
CL Critically Low: ≥2 critical weaknesses

AMSTAR 2 Individual Item Scoring

Green Yes
Yellow Partial Yes
Red No
White Not Applicable
15 Critical
16 Non-critical

AMSTAR 2 Individual Items

1. Did the research questions and inclusion criteria for the review include the components of PICO?
2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?
3. Did the review authors explain their selection of the study designs for inclusion in the review?
4. Did the review authors use a comprehensive literature search strategy?
5. Did the review authors perform study selection in duplicate?
6. Did the review authors perform data extraction in duplicate?
7. Did the review authors provide a list of excluded studies and justify the exclusions?
8. Did the review authors describe the included studies in adequate detail?
- 9a. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review? (RCTs)
- 9b. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review? (NRSIs)
10. Did the review authors report on the sources of funding for the studies included in the review?
- 11a. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? (RCTs)
- 11b. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? (NRSIs)
12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?
13. Did the review authors account for RoB in individual studies when interpreting/ discussing the results of the review?
14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?
15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

For instance, Sinha et al. (2017) found that multilevel interventions were most effective at improving breastfeeding outcomes in low- and middle-income settings, and S. K. Kim et al. (2018) had similar findings across all settings. Rana et al. (2021) also evaluated breastfeeding support packages in LMIC and found that

combination breastfeeding counselling and education packages were most effective in improving outcomes, including exclusive breastfeeding at 6 months. Dall'Oglio et al. (2020) similarly found that multilevel interventions were effective in complex humanitarian emergencies. The assessment of multilevel interventions was

TABLE 4 AMSTAR 2 confidence ratings for reviews of breastfeeding interventions involving family and community settings (n = 45)

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9a	Item 9b	Item 10	Item 11a	Item 11b	Item 12	Item 13	Item 14	Item 15	Item 16	Individual	Workplace	Health Systems	Family/Community	Structural	Confidence Level	
Whitford et al., 2017																									H
Ogbo et al., 2020																									CL
Dall'Oglio et al., 2020																				x	x	x	x		H
Gonzales, 2021																									CL
Hanson et al., 2017																									L
Lassi et al., 2019																									L
McFadden et al., 2019																									H
Tiruneh et al., 2019																									H
Tadesse et al., 2018																									L
Rana et al., 2021																				x	x	x	x		M
Mahesh et al., 2018																									H
Chipjola et al., 2020																				x					H
Seward et al., 2017																									L
Ashman et al., 2017																				x	x	x			H
Browne et al., 2018																									H
Rodríguez-Gallego et al., 2021																									H
Segura-Pérez et al., 2021																				x	x	x	x		H
Silva et al., 2016																									M
Lassi et al., 2020																				x	x				CL
Tol et al., 2020																									H
Koplin et al., 2019																				x	x				CL
Sinha et al., 2017																				x	x				CL
Askie et al., 2020																									L
Balogun et al., 2016																				x	x				H
Fair et al., 2019																									H
Kim et al., 2018																				x	x				L
Olufunlayo et al., 2019																				x	x				H
Cordell & Elverson, 2020																				x	x				M
Brockway et al., 2017																				x	x				CL
Sinclair et al., 2018																									H
Buckland et al., 2020																									H
Tokhi et al., 2018																									H
Oliveira et al., 2017																				x	x				CL
Martin et al., 2020																									H
Yamashita et al., 2020																									CL
Lange et al., 2020																				x	x				CL
Abbass-Dick et al., 2019																				x	x				H
Yonemoto et al., 2021																									H
McFadden et al., 2017																				x	x				H
Redsell et al., 2016																									H
Cheng et al., 2019																									M
Patel & Patel, 2016																				x	x				L
Janmohamed et al., 2020																									L
Negin et al., 2016																									L
Deeney & Harris-Fry, 2020																				x	x	x			H

AMSTAR 2 Confidence Ratings

- H** High: 0 critical weaknesses, ≤1 non-critical weakness
- M** Moderate: 0 critical weaknesses, ≥2 non-critical weaknesses
- L** Low: 1 critical weakness
- CL** Critically Low: ≥2 critical weaknesses

AMSTAR 2 Individual Item Scoring

- Green** Yes
- Yellow** Partial Yes
- Red** No
- White** Not Applicable
- 15** Critical
- 16** Non-critical

AMSTAR 2 Individual Items

- Did the research questions and inclusion criteria for the review include the components of PICO?
- Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?
- Did the review authors explain their selection of the study designs for inclusion in the review?
- Did the review authors use a comprehensive literature search strategy?
- Did the review authors perform study selection in duplicate?
- Did the review authors perform data extraction in duplicate?
- Did the review authors provide a list of excluded studies and justify the exclusions?
- Did the review authors describe the included studies in adequate detail?
- Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review? (RCTs)
- Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review? (NRSIs)
- Did the review authors report on the sources of funding for the studies included in the review?
- If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? (RCTs)
- If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? (NRSIs)
- If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?
- Did the review authors account for RoB in individual studies when interpreting/ discussing the results of the review?
- Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?
- If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?
- Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

Adapted from: Shea BJ, Reeves BC, Wells G, Thuku M, Hamel C, Moran J, Moher D, Tugwell P, Welch V, Kristjansson E, Henry DA. AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. *BMJ*. 2017 Sep 21;358:j4008.

TABLE 5 AMSTAR 2 confidence ratings for reviews of breastfeeding interventions involving workplace settings (n = 10)

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9a	Item 9b	Item 10	Item 11a	Item 11b	Item 12	Item 13	Item 14	Item 15	Item 16	Individual	Workplace	Health Systems	Family/Community	Structural	Confidence Level	
Hilliard, 2017																									L
Karacam & Saglik, 2018																					x	x			L
Dinour & Szaro, 2017																					x				CL
Silva et al., 2016																					x	x			M
Tokhi et al., 2018																					x	x			H
Navarro-Rosenblatt & Garmendia, 2018																					x				CL
Andres et al., 2016																					x		x		M
Taylor et al., 2020																					x				L
Nandi et al., 2018																					x		x		L
Jiménez-Mérida et al., 2020																					x				H
Tang, X et al., 2021																					x				H

Adapted from: Shea BJ, Reeves BC, Wells G, Thuku M, Hamel C, Moran J, Moher D, Tugwell P, Welch V, Kristjansson E, Henry DA. AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. *BMJ*. 2017 Sep 21;358:j4008.

complicated by methodological challenges of the different components of these studies.

Finally, few studies focused on policy-level interventions. Of these, it is notable that breastfeeding-friendly policies had a substantial impact

on minority women in the United States (Segura-Pérez et al., 2021). Very few studies included in this review addressed inequities within settings, and Segura-Pérez et al. (2021) noted the need for multilevel interventions in addressing breastfeeding inequities.

TABLE 6 AMSTAR 2 confidence ratings for reviews of individual-level breastfeeding interventions ($n = 10$)

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9a	Item 9b	Item 10	Item 11a	Item 11b	Item 12	Item 13	Item 14	Item 15	Item 16	Individual	Health Systems	Workplace	Family	Structural	Community	Confidence Level
Kassianos et al., 2019	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x					H
Petkovic et al., 2021	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x					H
Oriá et al., 2018	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x					H
Almohanna et al., 2020	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x					L
Galipeau et al., 2018	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x					L
Chipojola et al., 2020	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x					L
Lau et al., 2016	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x					L
Tang, K et al., 2019	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x					CL
Ekambareshwar et al., 2021	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x					H
Palmer et al., 2020	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x					H

Adapted from: Shea BJ, Reeves BC, Wells G, Thuku M, Hamel C, Moran J, Moher D, Tugwell P, Welch V, Kristjansson E, Henry DA. AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. *BMJ*. 2017 Sep 21;358:j4008.

TABLE 7 AMSTAR 2 confidence ratings for reviews of breastfeeding interventions involving a structural component ($n = 8$)

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9a	Item 9b	Item 10	Item 11a	Item 11b	Item 12	Item 13	Item 14	Item 15	Item 16	Individual	Health Systems	Workplace	Family	Structural	Community	Confidence Level
Dall'Oglio et al., 2020	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x	x	x			H
Rana et al., 2021	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x	x	x			M
Ashman et al., 2017	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x	x	x			H
Segura-Pérez et al., 2021	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x	x	x			H
Andres et al., 2016	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x	x	x			M
Washio et al., 2021	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x	x	x			H
Nandi et al., 2018	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x	x	x			L
Deeney & Harris-Fry, 2020	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	x	x	x	x			H

Adapted from: Shea BJ, Reeves BC, Wells G, Thuku M, Hamel C, Moran J, Moher D, Tugwell P, Welch V, Kristjansson E, Henry DA. AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. *BMJ*. 2017 Sep 21;358:j4008.

4 | DISCUSSION

Building on previously reported barriers and evidence that breastfeeding rates can rapidly improve by scaling up known interventions, policies, and programs (Rollins et al., 2016), studies in the past five years have continued to explore effective interventions at different levels across the social-ecological model. However, there are concerns with the quality of reviews and the evidence base the reviews build on, the distribution research by income setting, and disproportionate attention paid to some parts of the socio-ecological model over others.

Over half of reviews in the past five years are high- or moderate quality, with the remaining low or critically low quality due to weaknesses in assessment of bias. The lack of reporting of funding source is a notable noncritical weakness across studies. This is of concern because of the well-documented influence of the formula industry in shaping research favourable to it (Baker et al., 2021). Most studies in the included reviews addressed high- and upper-middle-income settings, with limited focus on low-income settings. This represents an inverse relationship between research focus and settings where the majority of the world's population resides.

In triangulating the distribution of reviews across the social-ecological model (Rollins et al., 2016), the limited number of interventions that

address workplace setting remains notable, despite a wealth of evidence that work policies can present substantial barriers to breastfeeding globally (Litwan et al., 2021; Rollins et al., 2016; Tang et al., 2021; Vilar-Compte et al., 2021). This pattern has persisted over the past 5 years, indicating a substantial gap in research in the work setting.

The majority of interventions that address barriers to breastfeeding continue to focus on health systems, particularly immediate postpartum care. Within hospital settings, there is continued high-quality evidence for components of BFHI, as well as for KMC and skin-to-skin-contact and strengthening evidence for cup feeding. There is also a substantial body of literature that continues to focus on community and family settings, which bridges health systems via education and support efforts carried out by health care providers or CHWs. The importance of home visits has been reinforced in recent literature (Rhodes et al., 2021; United Nations Children's Fund [UNICEF], & WHO, 2021). The strength of evidence for the importance of community engagement, including via CHW, and family involvement from fathers and grandmothers, continues to grow (Aubel et al., 2021). At the individual level, digital health interventions offer promising new opportunities for improving breastfeeding outcomes, but better-quality research design is necessary to ascertain the most effective types of interventions.

Multicomponent interventions have emerged as a promising way to combine insights across multiple levels of the socioecological model and to apply synergistic benefits (Dall'Oglio et al., 2020; S. K. Kim et al., 2018; Pérez-Escamilla, 2020; Rana et al., 2021; Sinha et al., 2017). However, most interventions remain focused on a specific setting. This may be due to challenges of funding for such larger packages as well as methodological challenges because of the multiple components involved which can lead to mixed study quality. Additional research gaps exist to address inequities within populations (Segura-Pérez et al., 2021). Implementation science offers frameworks and mixed-methods that can be used to guide and enhance the effectiveness of implementation of complex multicomponent breastfeeding interventions on a large scale in a changing policy landscape (Menon et al., 2016; Peven et al., 2020; Tumilowicz et al., 2019; Vilar-Compte et al., 2021). This is especially true for interventions that are well-supported by evidence. Additionally, implementation science offers comprehensive approaches to strengthen the enabling environments (Pérez-Escamilla et al., 2012) and to develop the quality assurance systems needed to sustain the reach and quality of multilevel programs on a large scale (S. S. Kim et al., 2015; Pérez-Escamilla et al., 2014; Peven et al., 2020; Vilar-Compte et al., 2021).

4.1 | Limitations

The review of reviews approach is limited by the reviews that were carried out in the past five years; they may not reflect the full scope of interventions that were undertaken to address breastfeeding barriers. Our study only examined literature in English and does not capture interventions that were published in other languages. This study was also not designed to ascertain the magnitude of effects of interventions. Nevertheless, the study presents an overview of the current state of research on interventions that aim to address breastfeeding barriers across the social-ecological model.

The application of the AMSTAR 2 Critical Appraisal Tool can only indicate the methodological quality of the review, not of the individual studies included in the review. Confidence scores should be interpreted as the level of confidence in the reviewers' methods and findings of the review, regardless of the quality of the evidence reviewed. For example, a systematic review carried out with poor methodology may receive a score of Critically Low, even if the quality of evidence among individual studies itself is strong. For these reasons, the authors have included a brief description of each review's assessment of quality and risk of bias for individual studies in Table S1.

5 | CONCLUSION

This study highlights the growing body of literature on effective interventions that address breastfeeding barriers. The literature suffers from some methodological challenges and continues to be primarily focused on high- and upper-middle income settings. Moreover, the literature is dominated by single-setting interventions primarily focused on healthcare settings, followed by community and family

settings. There is inadequate attention to interventions addressing policy and structural factors, and workplace settings. There is an additional need for rigorous assessment of multicomponent interventions, and further attention is necessary to address inequities within settings. Nevertheless, our review supports previous findings indicating that there is already a critical mass of knowledge available for effectively scaling up breastfeeding protection promotion and support programs (Pérez-Escamilla et al., 2012). This knowledge should be put immediately into action across the globe (Global Breastfeeding Collective, 2021).

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

Rafael Pérez-Escamilla conceived the study, with input from Cecilia Tomori, Sonia Hernández-Cordero, and Purnima Menon. Detailed methods were discussed by the group, and implemented by Natalie Busath. All authors contributed to the analysis of findings. Cecilia Tomori and Natalie Busath drafted the paper, and all authors participated in revision and finalization of the manuscript.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available in the supplementary material of this article.

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SUPPORTING INFORMATION

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