

Breastfeeding and the Impact on Postpartum Weight

A Focused Practice Question

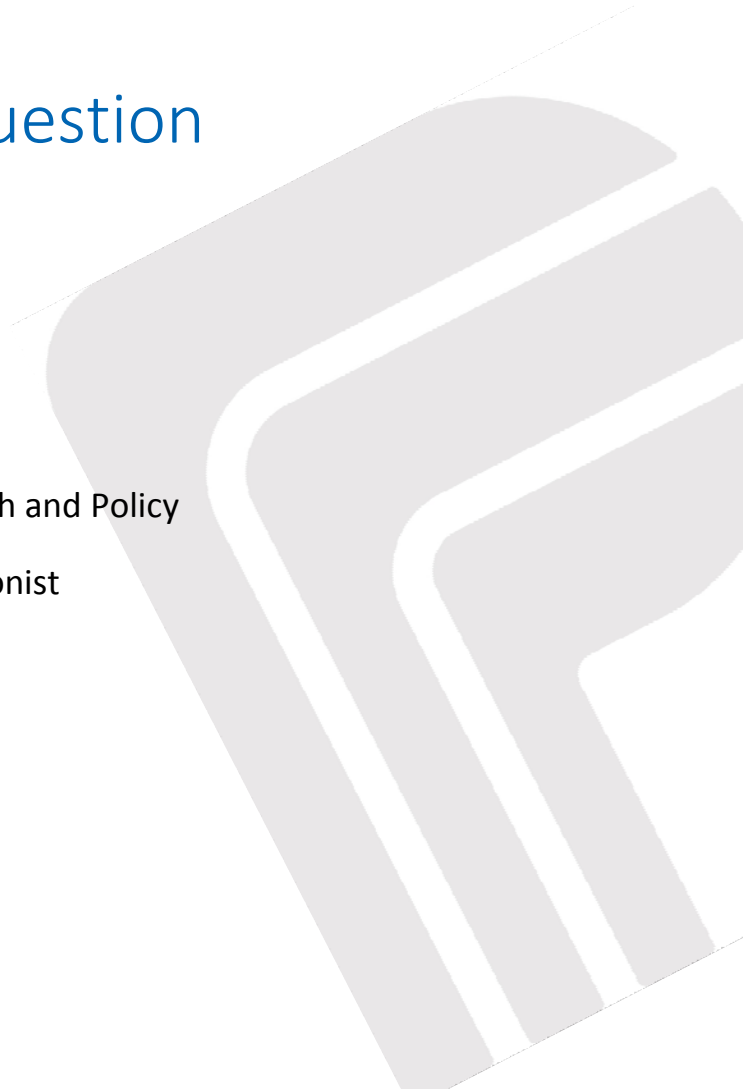
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Key Messages

1. Among postpartum women, the association between breastfeeding and postpartum weight is unclear.

1 Issue & Context

Following childbirth, mothers can experience increased challenges in achieving and maintaining a healthy body weight. In Peel, approximately one third (33%*- use with caution) ^A of women are overweight or obese entering pregnancy, increasing health risks to both mother and infant (e.g., gestational diabetes, gestational hypertension).¹ Many women also gain more weight than recommended in pregnancy. Approximately one quarter (24%*- use with caution) ^A of women in Peel gain the appropriate amount of weight, while 30%*(use with caution) gain above the recommended weight gain range. ^A There is moderate evidence that excessive gestational weight gain is positively associated with weight retention in the postpartum period. ² Entering subsequent pregnancies at a higher body weight has health risks for mom and baby. Weight gain above current recommendations in successive pregnancies can have cumulative adverse effects over the childbearing years.³ There is a window of opportunity to intervene with women to improve health prior to entering subsequent pregnancies.

As part of the Nurturing the Next Generation strategic priority, Region of Peel – Public Health (ROP-PH) aims to support women of childbearing age and pregnant women to achieve and maintain a healthy body weight. Adjusting to life after a baby can present many challenges for women attempting to lose weight or return to pre-pregnancy weight.³

Previously, ROP-PH provided messaging that “breastfeeding helps with weight loss after birth” in the *Formula No Thanks* campaign. However, the evidence base for this messaging is unknown. Anecdotally, nurses’ providing prenatal classes, breastfeeding clinic services, Healthy Babies Healthy Children home visits, and other direct services, share messages that weight loss is one of the benefits of breastfeeding. Local data show that 67% of mothers surveyed in 2016,

reported any breastfeeding at 6 months.⁴ The impact breastfeeding has on a mother's postpartum weight is unclear. A review of the most current evidence to determine the relationship between breastfeeding and maternal weight is needed.

2 Literature Review Question

Among postpartum women, what are the effects of breastfeeding on maternal weight?

Population (P):	Postpartum women
Exposure (E):	Any intensity or duration of breastfeeding
Comparator (C):	No breastfeeding, different intensities or durations of breastfeeding
Outcome (O):	Maternal weight or BMI change

3 Literature Search

In August 2018, a librarian searched published literature for synthesized evidence in the following databases: MEDLINE, MEDLINE In-Process, Healthstar, Cochrane Database of Systematic Reviews, Global Health, and CINAHL. Grey literature sources were: Turning Research into Practice (TRIP), Google, Open Grey, National Guideline Clearinghouse, United States Centers for Disease Control, Dietitians of Canada (Practice-based Evidence in Nutrition), National

Institute of Health and Care Excellence (NICE), Health Canada, and the World Health Organization (WHO). All searches were limited to English language. No date limits were used. See Appendix A.

4 *Relevance Assessment*

Relevance assessment was based on the following criteria:

- Inclusion criteria:
 - Postpartum women
 - Breastfeeding, pumping, or lactation
 - Outcomes of maternal body weight or BMI
 - English language
 - Systematic reviews and guidelines
 - All settings
- Exclusion criteria:
 - Women diagnosed with or receiving treatment for an existing condition (such as type 1 or type 2 diabetes, clinically diagnosed with postpartum mood disorder)
 - Women receiving other therapies, coaching, or treatments for weight management
 - Intervention effectiveness

5 *Results of the Search*

A search of published and grey literature identified 2831 articles. After removal of duplicates, first level relevance screening by a single reviewer was completed on 2582 articles. Two independent reviewers performed secondary relevance assessment of titles and abstracts. Full text assessment was completed on the 29 remaining articles. Any disagreements were resolved through discussion with a third reviewer. After full text review 22 articles were excluded. One review was initially considered, but later excluded as the two studies relevant to the Focused Practice Question (FPQ) were conducted in a developing country. The reviewers critically appraised the remaining seven articles. See Appendix B.

6 *Critical Appraisal*

Two reviewers independently appraised the seven systematic reviews using the Health Evidence™ Quality Assessment Tool. Disagreement was resolved in consultation with a third reviewer.

One strong quality (10/10) systematic review is included in this report. One moderate quality systematic review (6/10) was excluded because the data did not support the authors interpretation. This review was also excluded from the strong quality systematic review. Five systematic reviews were excluded due to low quality.

7 *Description of Included Papers*

Feltner C, Weber R, Stuebe A, Grodensky C, Viswanathan M (2018). Breastfeeding Programs and Policies, Breastfeeding Uptake, and Maternal Health Outcomes in Developed Countries. AHRQ Review. ⁵

This strong quality systematic review summarized the effectiveness of community, workplace, and health care system-based programs and policies aimed to support and promote breastfeeding. A secondary objective was to determine the association between breastfeeding and maternal health outcomes.

In total, 128 unique studies and 10 systematic reviews were included. Eighty-eight studies (51 case-control/cohort, 37 cohort) and 10 systematic reviews (178 cohort/case-control, 54 cohort studies) were relevant to the secondary objective of breastfeeding and maternal health outcomes. Specifically, 16 prospective cohort studies (n= 47,655) examining the relationship between breastfeeding and postpartum weight change were relevant to this FPQ (12 medium risk of bias (ROB), 4 high ROB). The population of interest was adolescent and adult childbearing women from developed countries. The exposures were exclusively breastfeeding (EBF), any breastfeeding (BF), mixed breastfeeding (MBF), bottle/formula feeding, and no BF at various time points. Exposures were categorized by breastfeeding duration, intensity, and exclusivity. The comparators included no breastfeeding, mixed feeding, formula feeding, and/or short BF duration. The outcome focused on postpartum weight change measured at various time points. Pre-weight measurement ranged from pre-pregnancy, during pregnancy and immediate postpartum. Postpartum weight measurement ranged from three months to 15 years

postpartum. The authors used a narrative synthesis with no pooled results due to significant heterogeneity across studies. See Appendix C.

8 Findings

Among postpartum women, the association between breastfeeding and postpartum weight is unclear.⁵ (Strength of Evidence: Insufficient)

There were mixed results from the 16 prospective cohort studies. The review authors graded the strength of evidence as insufficient because findings were inconsistent and imprecise.⁵ Due to significant heterogeneity in study design, BF exposure definitions, outcomes, and inconsistency in results, the authors found insufficient evidence to determine an association between breastfeeding and postpartum weight change.⁵

Of the 16 studies, nine reported significant results of an association between breastfeeding (various durations and intensities) and postpartum weight (measured at different times). Continuous outcomes were reported as mean differences (2 studies), correlations (2 studies), and regression coefficients (3 studies). Dichotomous outcomes were reported as odds ratios (2 studies). Despite statistically significant findings from these studies, results were small and did not reflect clinically meaningful changes in postpartum weight. Seven studies found no significant results. Overall the effect of breastfeeding and postpartum weight cannot be summarized from these results. See Appendix C.

The relationship between breastfeeding and weight retention is not clearly understood due to related factors that influence weight, such as pre-pregnancy weight, parity, activity level,

nutritional intake, socioeconomic status, and ethnicity.⁵ This makes it difficult to isolate the effects of breastfeeding on weight change. Most studies relied on self-report to determine breastfeeding exposure, and intensity of breastfeeding is not well described. The inconsistent measures of both exposure and outcome makes the association between breastfeeding and maternal weight challenging to assess.⁵

10 Recommendations

Region of Peel-Public Health should:

- 1) Share findings of this review with staff and relevant external partners to ensure consistent evidence-based messages are delivered to the public.
- 2) Ensure Family Health messaging related to breastfeeding and maternal weight is up-to-date and consistent in all web and paper-based resources.

References

- 1) National Institute for Health and Care Excellence. Public health guideline: Weight management before, during and after pregnancy. 2010; updated 2014; reviewed 2017. Available from: <https://www.nice.org.uk/guidance/ph27>
- 2) Muresan J, Carkner J, Morin C, Machado D. Outcomes associated with weight gain during pregnancy: A rapid review. Region of Peel. 2017 Jan. Available from: <http://www.peelregion.ca/health/library/pdf/outcomes-associated-GWG-rapid-review-report.pdf>
- 3) Institute of Medicine (IOM) and National Research Council (NRC). Weight gain during pregnancy: Re-examining the guidelines. Washington, DC: The National Academies Press; 2009. Available from: <https://www.nap.edu/catalog/12584/weight-gain-duringpregnancy-reexamining-the-guidelines>
- 4) Region of Peel Public Health. Peel Infant Feeding Survey. 2016
- 5) Feltner C, Weber RP, Stuebe A, Grodensky CA, Orr C, Viswanathan M. Breastfeeding Programs and Policies, Breastfeeding Uptake, and Maternal Health Outcomes in Developed Countries. Comparative Effectiveness Review No. 210. Agency for Healthcare Research and Quality; July 2018. Available from: <https://effectivehealthcare.ahrq.gov/topics/breastfeeding/research>

Data References

- A. Public Health Unit Analytic Reporting Tool (Cube), 2016, BORN Information System (BIS), BORN Ontario. Information accessed on March 25, 2018.

Data Notes

- A. Data are noted as 'use with caution', as 10-30% of records are missing.

Analyses of pre-pregnancy BMI and gestational weight gain do not include women with 3 or more fetuses, as there is not enough evidence to make a weight gain recommendation.

Analyses of gestational weight gain do not include women in the obese II and III categories, as there is no separate weight gain recommendation for these BMI categories.

Appendices

Appendix A: Search Strategy

Appendix B: Literature Search Flowchart

Appendix C: Data Extraction Tables

Appendix A: Search Strategy

Database: EBM Reviews - Cochrane Database of Systematic Reviews <2005 to August 15, 2018>, Global Health <1973 to 2018 Week 32>, Ovid Healthstar <1966 to June 2018>, Ovid MEDLINE(R) <1946 to August Week 2 2018>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <August 20, 2018>

Search Strategy:

1 ("data synthesis" or "evidence synthesis" or metasynthesis or meta-synthesis or "narrative synthesis" or "qualitative synthesis" or "quantitative synthesis" or "realist synthesis" or "research synthesis" or "synthesis of evidence" or "thematic synthesis" or metanaly* or meta-analy* or "systematic map*" or "systematic overview*" or "systematic review*" or "systematically review*" or "bibliographic search" or "database search" or "electronic search" or handsearch* or "hand search*" or "keyword search" or "literature search" or "search term*" or "article reviews" or "literature review" or "overview of reviews" or "review literature" or "reviewed the literature" or "reviews studies" or "this review" or "scoping stud*" or "overview study" or "overview of the literature" or meta-ethnograph* or meta-epidemiological or "data extraction" or "meta-regression").af. (5789289)










2 ((infant adj feeding) or (breast adj feeding) or (breast adj milk) or (mother* adj milk) or (maternal adj milk) or (human adj milk) or (infant adj lactation) or breastfeeding or breastfed or breastmilk).af. (146105)

3 (postpartum or post-partum or maternal or mother* or postnatal or post-natal or antenatal or perinatal or peri-natal or puerperal or post-parturient or post-pregnant*).af. (1083375)

4 (obesity or obese or overweight or bodyweight or weight or body or bodymass or mass or BMI or fat or adipos* or thin* or skin or skinfold).af. (6023302)

5 1 and 2 and 3 and 4 (4056)

6 remove duplicates from 5 (2397)

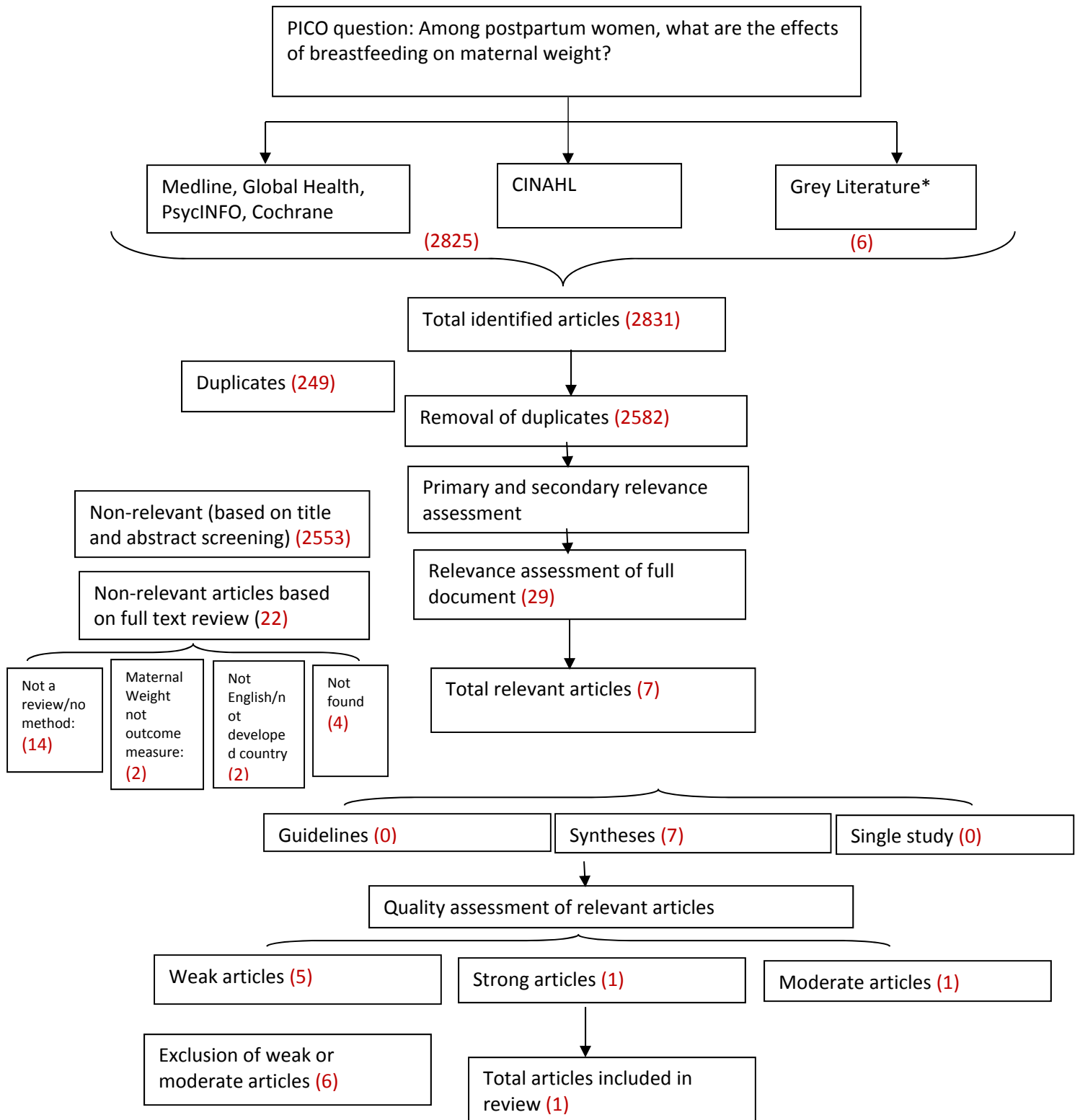
S6	 S1 AND S2 AND S3 AND S4	Limiters - Exclude MEDLINE records Search modes - Boolean/Phrase	View Results (445) 
S5	 S1 AND S2 AND S3 AND S4	Search modes - Boolean/Phrase	View Results (590) 
S4	 (obesity or obese or overweight or bodyweight or weight or body or bodymass or mass or BMI or fat or adipos* or thin* or skin or skinfold)	Search modes - Boolean/Phrase	View Results (3,855,646)
S3	 (postpartum or post-partum or maternal or mother* or postnatal or post-natal or antenatal or perinatal or peri-natal or puerperal or post-parturient or post-pregnan*)	Search modes - Boolean/Phrase	View Results (577,860)
S2	 ((infant adj feeding) or (breast adj feeding) or (breast adj milk) or (mother* adj milk) or (maternal adj milk) or (human adj milk) or (infant adj lactation) or breastfeeding or breastfed or breastmilk)	Search modes - Boolean/Phrase	View Results (30,926) 
S1	 ("data synthesis" or "evidence synthesis" or metasyntesis or meta-synthesis or "narrative synthesis" or "qualitative synthesis" or "quantitative synthesis" or "realist synthesis" or "research synthesis" or "synthesis of evidence" or "thematic synthesis" or "metanaly" or meta-analy* or "systematic map" or "systematic overview" or "systematic review" or "systematically review" or "bibliographic search" or "database search" or "electronic search" or handsearch" or "hand search" or "keyword search" or "literature search" or "search term" or "article reviews" or "literature review" or "overview of reviews" or "review literature" or "reviewed the literature" or "reviews studies" or "this review" or "scoping stud" or "overview study" or "overview of the literature" or meta-ethnograph* or meta-epidemiological or "data extraction" or "meta-regression") Show Less	Search modes - Boolean/Phrase	View Results (3,391,351)

* Final results screened from CINAHL were 428 articles. Seventeen duplicates were automatically removed when results were imported into RefWorks.

Grey Literature Search

Grey Literature Search - FPQ (Breastfeeding and Maternal Weight Outcomes)						
Source	Search Terms Used	Number of Titles Screened/Found	Title and Abstract Relevance		Full Text Relevance	
			Yes/Unsure	NO	Yes	NO
TRIP	breastfeed* AND "maternal weight"	102/102 Details: 5 systematics reviews (1 relevant), 3 guidelines (0 relevant), 1 synopses (0 relevant)	1	101	1	0
Google	breastfeed* AND "maternal weight" AND review	50/115000	8	42	1	3
Open Grey	breastfeed	11/11 reviewed	0	11	0	0
National Guideline Clearinghouse		60/119				
Centres for Disease Control		4/4 reviewed	0	4	0	0
Dietitians of Canada - PEN	breastfeed and maternal weight > Women's health - Lactation knowledge pathway	37/37 reviewed 1 knowledge pathway reviewed that included all 3 relevant results	3	0	3	0
NICE-Evidence	breastfeed* AND "maternal weight"	50/92	2	48	0	2
Health Canada	breastfeed* AND "maternal weight"	3/3 reviewed	0	3	0	0
WHO		8/8 reviewed	0	8	0	0

Appendix B: Literature Search Flowchart



* Refer to Appendix A for grey literature search strategy

Source: Health-evidence.ca. (2009, November 25). Keeping track of Search results: a Flowchart. Available at: http://www.healthevidence.org/practice-tools/HETools_KeepingTrackSearchResultsFlowchart_18.

Appendix C: Data Extraction Tables

Feltner C, Weber R, Stuebe A, Grodensky C, Viswanathan M. (2018). Breastfeeding Programs and Policies, Breastfeeding Uptake, and Maternal Health Outcomes in Developed Countries. AHRQ Review
https://effectivehealthcare.ahrq.gov/sites/default/files/pdf/cer-210-breastfeeding-report_1.pdf

General Information and Quality Rating	
Country (of authorship)	United States
Quality Rating using HE™QA Tool	10/10 (Strong) by two independent appraisers
Details of the Review	
Objective	<ul style="list-style-type: none"> To summarize the effectiveness of community, workplace, and health care system-based programs and policies aimed at supporting and promoting breastfeeding. To determine the association between breastfeeding and maternal health. <p><u>Key Questions</u></p> <p>Key Question 1 (KQ1):</p> <p>1a) What are the effectiveness and harms of programs and policies on initiation, duration, and exclusivity of breastfeeding?</p> <p>1b) To what extent do the effects and harms of programs and policies on initiation, duration, and exclusivity of breastfeeding differ for subpopulations of women defined by sociodemographic factors (e.g., age, race, ethnicity, socioeconomic status)?</p> <p>1c) To what extent do intervention-related characteristics (e.g., type of breast pump provided – manual or electric; delivery personnel) influence the initiation, duration, and exclusivity of breastfeeding?</p> <p>Key Question 2 (KQ2):</p> <p>2a) What are the comparative benefits and harms for maternal health outcomes among women who breastfeed for different intensities and durations?</p> <p>2b) To what extent do benefits and harms for maternal health outcomes differ for subpopulations of women defined by age, race, ethnicity, and comorbidity?</p>

Search period	<ul style="list-style-type: none"> • Updated search from previous 2007 AHRQ - November 1, 2005 to October 12, 2017 • Original search from 1966 to November 2005
Search Strategy	<ul style="list-style-type: none"> • PubMed/MEDLINE, Cochrane Library, and CINAHL • Unpublished studies using ClinicalTrials.gov • Manually searched reference lists of pertinent reviews
Inclusion/exclusion criteria for KQ2	<p>Inclusion and exclusion criteria were developed using PICOTS (populations, interventions, comparators, outcomes, time frames, setting), study designs, and study durations</p> <p><u>Inclusion criteria:</u></p> <ul style="list-style-type: none"> • P- Childbearing women and adolescents and subgroups of women defined by age, race, ethnicity, comorbidity, and socioeconomic status • I – Exposure to breastfeeding • C – No breastfeeding (BF), shorter duration (e.g., 1 month vs 12 months) and/or less intensive BF (e.g. exclusive BF vs. mixed feeding or formula feeding) • O – Postpartum depression, postpartum weight change, breast cancer, ovarian cancer, osteoporotic fracture, type 2 diabetes, hypertension, cardiovascular outcomes • Country setting – Studies conducted in a developed country (very high and high human development index per the United Nations Development Programme) • Study designs – RCTs, NRCTs, cohort studies, case-control studies, systematic reviews • Publication language - English <p><u>Exclusion criteria:</u></p> <ul style="list-style-type: none"> • P - Nulliparous women • I – All other exposures • C – All other comparisons or no comparisons • O – Any other outcome not specified, including complications of lactation and other maternal outcomes • Setting – studies conducted in other countries • Study designs – all other study designs • Publication language – all other languages excluded
Number and type of primary studies included	<ul style="list-style-type: none"> • 128 individual studies and 10 systematic reviews <p>KQ1 (40 studies)</p> <ul style="list-style-type: none"> • Randomized Control Trials (RCT) (13), Non-randomized Control Trials (NRCT) (8), Cohort studies (19)

	<p>KQ2 (88 studies and 10 systematic reviews)</p> <ul style="list-style-type: none"> Case control (1), cohort (37), case control/cohort (50) <p>Systematic reviews (10) included: cohort/case control (178), cohort (54)</p>
Quality of included studies	<ul style="list-style-type: none"> Evaluated risk of bias of individual studies using an adapted version of the ROBINS-I for observational studies, and the Cochrane Risk of Bias (ROB) assessment tool for trials. Risk of Bias (ROB) assessment of observational studies included: <ul style="list-style-type: none"> Selection Confounding Measurement of exposure Attrition Measurement of outcomes Reporting Studies rated as high, medium, or low ROB based on scores in each domain
Characteristics of the studies included in review	
Studies relevant to the FPQ	<ul style="list-style-type: none"> 16 prospective cohort studies related to postpartum weight change (reported in 18 publications) (n=47,655 women) Focused analysis on the furthest time point available for each study Developed countries: United States (11), Canada (1), Taiwan (1), Sweden (1), Australia (1), Norway (1)
Study population(s)	<ul style="list-style-type: none"> Childbearing women (adults and adolescents)
Description of exposure(s)	<p>BF exposure varied in terms of duration and exclusivity. Measures of BF exposure included:</p> <ul style="list-style-type: none"> Exclusive breastfeeding (EBF), any breastfeeding (BF), Mixed breastfeeding (MBF), bottle/formula feeding, no BF Definitions of BF varied according to study
Outcome measures	<p>Maternal weight was measured at various time points ranging from pre-pregnancy to 15 years postpartum.</p>
Results of the Review	
Main results relevant to FPQ	<p>Among postpartum women, the association between breastfeeding and postpartum weight change is unclear. The magnitude of postpartum weight change varies by BF exposure and outcome measure.</p> <ul style="list-style-type: none"> 16 cohort studies; 12 medium ROB, 4 high ROB Strength of evidence: Insufficient (inconsistent,

	<p>imprecise)</p> <p>Duration of BF and postpartum weight (10 Studies) Breastfeeding quantified in terms of duration, however measurement outcome varied:</p> <ul style="list-style-type: none"> • 3/10 studies reported weight change between an early postpartum period (1-14 days after delivery) to later in the postpartum period (12 to 24 months). <ul style="list-style-type: none"> ○ Of these, only 1/3 studies (high ROB) reported a significant result: women who breastfed for at least 3 months had lower odds of postpartum weight retention from pre-pregnancy to 12 months within the top quintile, when compared with breastfeeding for less than 3 months or not breastfeeding (Adjusted OR: 0.673; 95% CI, 0.471 to 0.961, p=0.03).¹ • 1/10 studies (medium ROB) reported on weight change between early pregnancy (first prenatal visit) and 1 year postpartum and found greater weight reduction among women who breastfed vs those who did not (duration of BF not specified in systematic review).² (Regression coefficient: -1.20, Standard Error (SE): 0.52, p=0.02) • 6/10 studies reported on weight change from pre-pregnancy to postpartum: weight measured at time points ranging from 6 months to 8 years postpartum. <ul style="list-style-type: none"> ○ 3/6 studies reported results that were not significant. ○ 2/6 studies (high ROB) used linear regression analysis to report statistical difference among women who breastfed for ≥ 5 months. <ul style="list-style-type: none"> ▪ 1/6 studies reported a significant correlation for the group with the longest period of exposure. BF for 20
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¹ Adjusted for Maternal age, employment, education, alcohol intake and smoking during pregnancy, nonmedical drug use, primiparity, pre-existing hypertension, marital status, paternal employment and education, household ownership, number of children under age 16, and year of recruitment

² Adjusted for age, marital status, income, gestational weight gain, food intake, and exercising often

	<p>weeks or more has a negative correlation to postpartum weight change. (Regression coefficient, β: -0.39, SE: 0.18, $p=0.03$).³</p> <ul style="list-style-type: none"> ▪ 1/6 studies reported lower odds of weight retention among those who were still breastfeeding at 6 months postpartum compared with those who were not. (Weight as a categorical outcome: OR = 0.53, 95% CI, 0.36 to 0.79. Weight as a continuous outcome: β = -3.29, 95% CI, -4.88 to -1.76).⁴ ○ 1/6 studies (medium ROB) reported a lower odds of weight retention of 20 pounds or more among those who partially or exclusively breastfed for 6 months or more when compared with those who did not (OR 0.46, 95% CI: 0.24 to 0.87)⁵ <p>Duration and Intensity of BF and postpartum weight (3 studies)</p> <ul style="list-style-type: none"> • 2/3 studies (using the Stockholm Pregnancy and Women’s Nutrition Study) evaluated weight change from pre-pregnancy to different time points: 1 year, 18 months, and 15 years postpartum. Reported significant results favoring greater intensity of breastfeeding. <ul style="list-style-type: none"> ○ Correlation between weight change through 1 year postpartum and lactation score (using amount and duration), ($r= -0.09$, $p,0.01$, multiple stepwise regression analysis had a regression coefficient of -0.04, $p,0.001$, high ROB).⁶ ○ Women who became overweight had lower lactation scores than women who remained normal weight at 15 years follow-up (BMI
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³ Adjusted for age, race, ethnicity, education, parity, GWG, smoking status, and pre-pregnancy BMI

⁴ Adjusted for pre-pregnancy BMI, age, cortisol slope, public health insurance status, race/ethnicity, cortisol covariates such as tobacco use, birth control pill usage, wake time

⁵ No adjustments

⁶ Adjusted for GWG, age, pre-pregnancy BMI, and parity

	<p>21.7 vs. BMI 24.0, p,0.05 for t test, medium ROB)⁷</p> <ul style="list-style-type: none"> • 1/3 studies (medium ROB) evaluated weight change from immediately after delivery to 9 months postpartum, found no significant results based on intensity.⁸ <p>Duration and Exclusivity of BF and postpartum weight (4 publications of 3 studies)</p> <ul style="list-style-type: none"> • One study (medium ROB) (Infant Feeding Practices Study II) evaluated weight change from the highest pregnancy weight to 12 months postpartum. The authors reported significant results in postpartum weight loss, return to pre-pregnancy BMI category, and return to pre-pregnancy weight among those who were exclusively breastfeeding for 3 or more months compared with those who did not.⁹ <ul style="list-style-type: none"> ○ Postpartum weight loss: difference of -3.2 pounds (95% CI, -1.7 to -4.7 pounds, p,0.05) ○ Return to pre-pregnancy BMI: 6.0 percentage point increase (95% CI, 2.3 to 9.7), p,0.01) ○ Return to pre-pregnancy weight: 6.1 percentage point increase (95% CI, 1.0 to 11.3, p,0.05) • One publication using a subset of women from the above study evaluated change in weight from pre-pregnancy to 6 years postpartum and found benefit only for obese women who were most adherent to breastfeeding guidelines (duration and exclusivity) (n=19, mean change in kg: -8.0, 95% CI -15.4 to -0.7, medium ROB) • One study stratified results by BMI, parity, and intensity- generally found no differences in weight from a pre-pregnancy measurement to weight at 1 to 2 years postpartum with two exceptions: <ul style="list-style-type: none"> ○ Higher weight retention (approximately 1 kg) in underweight nulliparous women who breastfed exclusively for up to 7 months vs
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⁷ no adjustments. unclear reporting of lactation scores in systematic review

⁸ Intensity of breastfeeding among groups is not reported in systematic review

⁹ Adjusted for maternal age, race/ethnicity, parity, education, pre-pregnancy obesity, prenatal insurance coverage, postpartum smoking, C-section, infant in ICU postpartum, and BF support

	<p>those who did not ($p=0.05$; medium ROB)</p> <ul style="list-style-type: none"> ○ Higher weight retention (approximately 1kg) in obese primiparous women who breastfed exclusively ≥ 12 months vs. those who did not ($p=0.04$, medium ROB) ● One study (medium ROB) evaluated change in weight and weight-height index from 1-2 days to 6 months postpartum- found no significant results.
<p>Comments and limitations</p>	<p>The review authors noted the following:</p> <ul style="list-style-type: none"> ● Due to significant heterogeneity in study design, BF exposure definitions, outcomes, and inconsistency in results, the authors found insufficient evidence to determine an association between breastfeeding and postpartum weight change ● The relationship between breastfeeding and weight retention is not clearly understood due to related factors which influence weight, making it difficult to isolate the effect of breastfeeding on weight change. ● Other factors associated with weight change include pre-pregnancy weight, parity, activity level, nutritional intake, socioeconomic status, and ethnicity. ● Majority of studies rely on self-report to categorize breastfeeding exposure (recall bias). ● Evidence on the association between breastfeeding from older cohorts of women may or may not reflect the strength of association for women currently breastfeeding (taken from a study investigating weight change up to 15 years postpartum). ● Standardized definitions of breastfeeding, as well as consistent methods of collecting data, are needed to facilitate future systematic reviews and meta-analyses.