Experiences of Breastfeeding at Work for Physicians, Residents, and Medical Students

Appendices
Table of Contents

Appendix 1: Scoping Review Protocol and Search Terms

Appendix 2: Data Extraction Tool

Appendix 3: Table of the characteristics of all included citations, including themes and outcomes reported and risk of bias assessment.
Appendix 1: Scoping Review Protocol and Search Terms

Background:

The benefits of breastfeeding for both the mother and baby are well known. Current Canadian guidelines recommend exclusive breastfeeding until six months of age, with continuation of complimentary breastfeeding until 24 months or longer.\textsuperscript{1,2}

In North America, the proportion of female trainees and physicians in practice is rising. In Canada, 41\% of the current physician workforce is made of women.\textsuperscript{3} For the first time in the United States, female trainees make up more of the current medical school classes than males. Medical students, residents, and newly practicing physicians train during the peak of their reproductive years. Therefore, support for breastfeeding in this patient population is particularly important if these individuals are to meet their breastfeeding goals, and current guideline recommendations.

The purpose of this study is to conduct a review of studies to explore rates and barriers to breastfeeding among female trainees and physicians.

1.0 Focused Question:

Primary
1. What are the barrier and facilitators to breastfeeding upon return to training or practice?

Secondary
1. What is the rate of breastfeeding among medical trainees and physicians?

2.0 Search Strategy:

The online databases to be searched are Medline (between 1940-2019) and EMBASE (Excerpta Medica Database) and between 1980 and 2019.

1. ("residen*" or "junior doctor*" or "doctor*" or "physician*" or "intern" or "attending*" or "medical student*" or "trainee").mp.
2. ("residen*" or "junior doctor*" or "doctor*" or "physician*" or "intern" or "attending*" or "medical student*" or "trainee").tw.
3. ("breastfeed*" or "breastfed*").mp.
4. ("breastfeed*" or "breastfed*").tw.
5. 1 OR 2
6. 3 OR 4
7. 5 AND 6

3.0 Initial Screen of Abstracts:

One individual will conduct an initial screen of identified abstracts. Abstracts will be considered for further review if:
1. They report on mothers who have had children while in medical school, in residency, or as staff physicians
2. Comment on breastfeeding

Abstracts will not be considered for further review if:

1. They do not mention physician or medical trainee mothers
2. They do not mention breastfeeding

The initial screen is intentionally broad in an attempt to capture any relevant literature.

4.0 Second Screen of Articles Identified for Eligibility:

Two individuals (AF, AM) will scan full-text articles for eligibility based on the following criteria:

Participants:

Include:

a. Mothers who have had children
   i. During medical school training
   ii. During residency training
   iii. As staff physicians

Intervention

b. Providing facilities and policies that support breastfeeding and expressing breastmilk

Comparison:

a. Lack of facilities and policies that support breastfeeding and expressing breastmilk

Outcome:

Include:

a. Ability to maintain breastfeeding upon:
   i. Return to work
   ii. 6-months postpartum
   iii. 12-months postpartum
   iv. 18-months postpartum
   v. 24-months postpartum
b. Subjective quality of life assessment after return to work
c. Barriers to breastfeeding upon return to work

References:

1. Critch JN, Canadian Paediatric S, Nutrition, Gastroenterology C. Nutrition for healthy term infants, six to 24 months: An overview. Paediatr Child Health. 2014;19(10):547-552.
2. Health C, Canadian Paediatric S, Dietitians of C, Breastfeeding Committee for C. Nutrition for healthy term infants: recommendations from birth to six months. Can J Diet Pract Res. 2012;73(4):204.
3. Glauser W. Medicine changing as women make up more of physician workforce. *CMAJ News* 2018.

4. More Women Than Men Enrolled in U.S. Medical Schools in 2017. *AAMC News* 2017.
### Data Extraction Form

Date form completed: _____________________________________________
Name: _________________________________________________________

| Study Demographics |
|---------------------|
| Paper Title         |
| First Author        |
| Year                |
| Journal             |
| Publication type    |
| *Letter, abstract, poster, article* |
| Study type          |
| *Survey, interviews, mixed methods* |
| Country where study was conducted | |
| Number of participating centres | |
| Funding |  |
| --- | --- |
| Conflicts? |  |

### Eligibility

| Inclusion |  |
| --- | --- |
| Abstract screen: physician mothers, breastfeeding addressed. | Yes | No |
| Study participants include mothers who have had children while: |  |
| 1) In medical school | Yes | No |
| 2) In residency |  |
| 3) As staff |  |
| Study must report on (a) or (b): |  |
| Rates of breastfeeding on return to work and/or at 6, 12, 18, 24 months postpartum. | Yes | No |
| Barriers or experiences of breastfeeding. | Yes | No |

### Exclusion

|  |
| --- |
| Study aim is to assess physician knowledge, attitudes, or practice patterns of breastfeeding as it related specifically to patients who breastfeed. | Yes | No |

### Population, Setting & Methods

|  |
| --- |
| Population (mother) |  |
| Student, trainee, staff. |  |
| Woman in medicine, man in medicine, partner of man in medicine. |  |
| Population (comparison) | Non-parents, program directors |
|-------------------------|---------------------------------|
| Study site              | Hospital, clinic, residency program. |
| Method of recruitment   |                                  |
| Notes                   |                                  |
| Study start date        |                                  |
| Study end date          |                                  |
| Number of participants  |                                  |
| Response rate           | If applicable, specify all groups. |
| Data type               | If survey, specify distribution (mail, electronic) and type of instrument (named, validity). |

**Outcomes**

| Intended to breastfeed |
| (n, %)                         |               |
|-------------------------------|---------------|
| Initiated breastfeeding       |               |
| (n, %)                        |               |
| Met breastfeeding goal        |               |
| (n, %)                        |               |
| Breastfeeding goal (duration) |               |
|                                |                                      |
|--------------------------------|--------------------------------------|
| **Actual breastfeeding duration** | *(mean, median, SE, SD)*             |
| **Reasons for not meeting goal** | *With rates, if applicable*          |
| **Intended duration of maternity leave** |                                |
| **Actual duration of maternity leave** |                                |
| **Attempted to breastfeed at work** | *(n, %)*                             |
| **Barriers identified**          | *Structural, discrimination, etc.*  |
|                                 | *Include as much detail as possible (location, frequency).* |
| **Other outcome data**           |                                      |
| Themes                                | Comment | Positive/Favourable or Negative/Barrier |
|--------------------------------------|---------|----------------------------------------|
| Length of maternity leave            |         |                                        |
| Planned, actual (if applicable)      |         |                                        |
| Qualitative description              |         |                                        |
| Time constraints for breastfeeding at work |         |                                        |
| Colleague support                    |         |                                        |
| Perceived, actual (if applicable)    |         |                                        |
| Qualitative description              |         |                                        |
| Structural support                   |         |                                        |
| Limitations |  |
|---|---|
| List all: |  |

| Harassment & discrimination |  |
|---|---|

| Other |  |
# Risk of Bias Assessment

**Surveys (Cochrane)**

https://www.evidencepartners.com/wp-content/uploads/2017/09/Risk-of-Bias-Instrument-for-Cross-Sectional-Surveys-of-Attitudes-and-Practices.pdf

| Question                                                                 | Definitely yes | Probably yes | Probably no | Definitely no |
|--------------------------------------------------------------------------|----------------|--------------|--------------|---------------|
| Is source population representative of the population of interest?       |                |              |              |               |
| Is the response rate adequate?                                           | Definitely yes | Prob. yes    | Prob. no     | Definitely no |
| Missing data?                                                             | Definitely yes | Prob. yes    | Prob. no     | Definitely no |
| Is the survey clinically sensible?                                       | Definitely yes | Prob. yes    | Prob. no     | Definitely no |
| Survey was pilot tested?                                                 | Definitely yes | Prob. yes    | Prob. no     | Definitely no |
| Survey was reliable and validated?                                       | Definitely yes | Prob. yes    | Prob. no     | Definitely no |
## Risk of Bias Assessment
Qualitative/Interview Studies (CASP)

https://casp-uk.net/wp-content/uploads/2018/01/CASP-Qualitative-Checklist-2018.pdf

| Question                                                                 | Yes | Can't tell | No  |
|--------------------------------------------------------------------------|-----|------------|-----|
| Was there a clear statement of the aim of the research?                  |     |            |     |
| Is the qualitative methods appropriate?                                  | Yes | Can't tell  | No  |
| Was the research design appropriate to address the aims of research?     | Yes | Can't tell  | No  |
| Was the recruitment strategy appropriate?                                 | Yes | Can't tell  | No  |
| Was the data collected in a way that addressed the research issue?       | Yes | Can't tell  | No  |
| Has the relationship between research and participants been adequately considered? | Yes | Can't tell  | No  |
| Have ethical issues been taken into consideration?                       | Yes | Can't tell  | No  |
| Was data analysis sufficiently rigorous?                                  | Yes | Can't tell  | No  |
| Is there a clear statement of findings?                                  | Yes | Can't tell  | No  |
| How valuable is the research?                                            | Yes | Can't tell  | No  |
## Appendix 3: Characteristics of all included citations with outcomes and themes reported and risk of bias assessment, where relevant.

| First Author | Year | Journal | Study Design | Participants | Participants(n)* | Breastfeeding intentions & goals | Breastfeeding duration | Space | Time | Complications from inadequate milk expression | Milk Supply | Duration of leave | Colleague Support | Harassment & Discrimination | RoB |
|--------------|------|---------|--------------|--------------|------------------|----------------------------------|------------------------|-------|------|-----------------------------------------------|-------------|------------------|------------------|--------------------------|-----|
| Gjerdingen   | 1995 | Family Medicine | Survey | Residents | 171             | Yes                             | Yes                    | Yes   | Yes  | Yes                                           | Yes          | Yes              | Yes              | Low                      |     |
| Miller       | 1996 | Pediatrics | Survey | Physicians | 60              | Yes                             | Yes                    | Yes   | Yes  | Yes                                           | Yes          | Yes              | Yes              | High                     |     |
| Arthur       | 2003 | Southern Medical Journal | Survey | Physicians | 155             | Yes                             | Yes                    |       | Yes  | Yes                                           | Yes          | Yes              | Yes              | Low                      |     |
| Arthur       | 2003 | Journal of the Mississippi Medical Association | Survey | Physicians | 251             | Yes                             | Yes                    | Yes   | Yes  | Yes                                           | Yes          | Yes              | Yes              | High                     |     |
| Yaman        | 2004 | Coll Anthropol | Survey | Physicians | 221             | Yes                             |                        |        |      |                                               |              |                  |                  | High                     |     |
| Walsh        | 2005 | Canadian Family Physician | Survey | Residents | 6               | Yes                             | Yes                    | Yes   | Yes  | Yes                                           | Yes          | Yes              | Yes              | Low                      |     |
| Kacmar       | 2006 | Medicine and Health | Survey | Residents | 15              | Yes                             |                        |        |      |                                               |              |                  |                  | Low                      |     |
| Duke         | 2007 | Canadian Family Physician | Survey | Physicians | 89              | Yes                             |                        |        |      |                                               |              |                  |                  | Low                      |     |
| Year  | Author | Journal                          | Type        | Participants | Feedback | Comments |
|-------|--------|----------------------------------|-------------|--------------|----------|----------|
| 2008  | Brodribb | Journal of Human Lactation       | Survey      | Residents    | Yes      | Low      |
| 2008  | Brodribb | Maternal and Child Health Journal | Survey      | Residents    | Yes      | Low      |
| 2009  | Cole    | The American Surgeon             | Interviews  | Residents    | Yes      | High     |
| 2010  | Sattari | Breastfeeding Medicine           | Survey      | Residents & Physicians | Yes | High |
| 2010  | Lerner  | The Journal of Urology           | Survey      | Physicians   | Yes      | Low      |
| 2011  | Merchant | Canadian Journal of Surgery      | Survey      | Residents    | Yes      | High     |
| 2011  | Hutchinson | Family Medicine                | Survey      | Residents    | Yes      | Low      |
| 2011  | Farris (Abstract) | Academic Emergency Medicine   | Survey      | Residents    | Yes      | Low      |
| 2011  | Sadoh   | Niger Medical Journal            | Survey      | Physicians   | Yes      | High     |
| Arichondo 2012 | Southern Medical Journal | Survey | Residents & Physicians | 73 | Yes | Low |
|----------------|-------------------------|--------|------------------------|----|-----|-----|
| Hamilton 2012 | Journal of Bone and Joint Surgery of America | Survey | Residents & Physicians | 704 | Yes | Yes | Yes | Yes | High |
| Riggins 2012 | Breastfeeding Medicine | Survey | Residents & Physicians | 37 | Yes | Yes | Yes | Yes | High |
| Orth 2013 | Breastfeeding Medicine | Survey | Residents | 141 | Yes | Yes | Yes | Yes | High |
| Sattari 2013 | Breastfeeding Medicine | Interviews | Residents & Physicians | 152 | Yes | Yes | Yes | Yes | Yes | Low |
| Sattari (Abstract) 2013 | Breastfeeding Medicine | Survey | Physicians | 238 | Yes | Yes |
| Sattari 2013 | Journal of Pediatrics | Survey | Physicians | 238 | Yes | Yes | Yes | Yes | Low |
| Merchant 2013 | Canadian Journal of Surgery | Survey | Residents | 23 | Yes | Yes | Yes | Yes | Low |
| Esan 2013 | African Journal of Medical Sciences | Survey | Physicians | 50 | Yes | High |
| Author(s) | Year | Journal | Study Group | Sample Size | Exposure | Outcome 1 | Outcome 2 | Outcome 3 | Outcome 4 | Outcome 5 | Outcome 6 | Outcome 7 | Country |
|-----------|------|---------|-------------|-------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
| Spatz     | 2014 | Breastfeeding Medicine | Survey Physicians NR | | Low |
| Holliday  | 2015 | International Journal of Radiation, Oncology, Biology, and Physics | Survey Residents 46 | Yes Yes Yes | Yes |
| Dixit     | 2015 | Journal of Human Lactation | Survey Residents & Physicians 361 | | Yes |
| Dixit     | 2015 | Journal of Human Lactation | Survey Medical Students & Residents 421 | Yes Yes Yes Yes Yes Yes | Low |
| Sattari   | 2016 | Breastfeeding Medicine | Survey Physicians 139 | Yes Yes Yes Yes | Low |
| Sandler   | 2016 | Journal of the American College of Surgeons | Survey & Interviews Residents NR | Yes Yes Yes Yes | Low |
| Name         | Year | Journal/Publication                          | Survey Type | Participants | Quality Control | Quality | Methodology Control |
|--------------|------|----------------------------------------------|-------------|--------------|-----------------|---------|---------------------|
| Maraolo      | 2017 | European Journal of Clinical Microbiology and Infectious Diseases | Survey Residents 83 | Yes          | High            |         |                     |
| Rodriguez Lien | 2017 | Breastfeeding Medicine                       | Survey Physicians 95 | Yes          | High            |         |                     |
| Sarma        | 2017 | Journal of the American College of Cardiology | Survey Physicians 501 | Yes Yes Yes Yes Yes | High |                     |
| Eren         | 2018 | Turkish Archives of Pediatrics Postgraduate Medical Journal | Survey Physicians 109 | Yes Yes | Yes | Low |
| Stack        | 2018 | JAMA Surgery                                  | Survey Residents 50 | Yes          | Low             |         |                     |
| Rangel       | 2018 | JAMA Internal Medicine                       | Survey Residents & Physicians 344 | Yes Yes Yes Yes Yes | Low |                     |
| Melnitchouk  | 2018 | Breastfeeding Medicine                       | Survey Medical Students, Residents, & Physicians 1606 | Yes Yes Yes Yes Yes | High |                     |
| Cantu        | 2018 | Breastfeeding Medicine                       | Survey Medical Students, Residents, & Physicians 232 | Yes Yes Yes | High |                     |
| Last Name | Year | Journal Title | Study Type | Participants | Disclosure 1 | Disclosure 2 | Disclosure 3 | Disclosure 4 | Disclosure 5 | Disclosure 6 | High/Low |
|-----------|------|---------------|------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|----------|
| Sattari   | 2018 | Journal of Pediatric Care | Survey Physicians | 947 | Yes | Yes | Yes | Yes | High |
| Landon    | 2018 | Journal of Obstetrics and Gynecology Canada | Survey & Interviews Residents | 15 | Yes | Yes | Yes | Low |
| Stack     | 2019 | Academic Medicine | Survey Residents | 126 | Yes | Yes | Yes | Low |
| Martin    | 2019 | Maternal and Child Health Journal | Survey Resident & Physicians | 300 | Yes | Low |
| Mwakanyjala | 2019 | Journal of the American Heart Association | Survey Residents | 10 | Yes | High |
| Al-Imari  | 2019 | Family Medicine | Survey Residents | 56 | Yes | Yes | Yes | Low |
| Gupta     | 2019 | Breastfeeding Medicine | Survey Residents | 708 | Yes | Yes | Yes | High |
| Pearson   | 2019 | Anesthesia & Analgesia | Survey Residents & Physicians | 66 | Yes | Yes | Yes | Low |
| Ames      | 2019 | Breastfeeding Medicine | Survey Residents | 12 | Yes | Yes | Yes | High |
| First Author | Year | Journal                        | Study Design             | Systematic Search | Breastfeeding intentions & goals | Breastfeeding duration | Space | Time | Complications from inadequate milk expression | Milk Supply | Duration of leave | Colleague Support | Harassment & Discrimination | RoB |
|--------------|------|-------------------------------|--------------------------|-------------------|---------------------------------|-----------------------|-------|------|-----------------------------------------------|-------------|------------------|------------------|-----------------------------|-----|
| Mills        | 2019 | Journal of Obstetrics and Gynecology Canada | Survey | Residents | 118 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | High |
| Ziai         | 2020 | Canadian Women in Medicine Newsletter | Survey | Residents | 170 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | High |

**Reviews**

| First Author | Year | Journal                        | Study Design             | Systematic Search | Breastfeeding intentions & goals | Breastfeeding duration | Space | Time | Complications from inadequate milk expression | Milk Supply | Duration of leave | Colleague Support | Harassment & Discrimination | RoB |
|--------------|------|-------------------------------|--------------------------|-------------------|---------------------------------|-----------------------|-------|------|-----------------------------------------------|-------------|------------------|------------------|-----------------------------|-----|
| Finch        | 2003 | Academic Medicine             | Systematic Review        | Yes               | Yes                             | Yes                   | Yes   | Yes  |                                 |             |                  |                  | N/A                         |     |
| Verlander    | 2004 | Academic Psychiatry           | Narrative Review         | No                |                                 |                       | Yes   |       |                                 |             |                  |                  | N/A                         |     |
| Sattari      | 2010 | Breastfeeding Medicine        | Narrative Review         | No                | Yes                             | Yes                   | Yes   | Yes  |                                 |             |                  |                  | N/A                         |     |

**Editorials & Letters to the Editor**

| First Author | Year | Journal | Study Design                  | Participants | Breastfeeding intentions & goals | Breastfeeding duration | Space | Time | Complications from inadequate milk expression | Milk Supply | Duration of leave | Colleague Support | Harassment & Discrimination | RoB |
|--------------|------|---------|-------------------------------|--------------|---------------------------------|-----------------------|-------|------|-----------------------------------------------|-------------|------------------|------------------|-----------------------------|-----|
| Balk         | 1982 | Pediatrics | Letter to the Editor       | Resident     |                                 |                       |       |      |                                 |             |                  |                  | N/A                         |     |
| First Author | Year | Journal | Study Design | Participants | Breastfeeding intentions & goals | Breastfeeding duration | Space | Time | Milk Supply | Duration of leave | Colleague Support | Harassment & Discrimination | RoB |
|--------------|------|---------|--------------|--------------|---------------------------------|------------------------|-------|------|------------|-----------------|----------------|----------------------|-----|
| MacDonald    | 2003 | Family Physician | Narrative Essay | Resident     | Yes                             |                         |       |      |            |                 |                |                      | N/A |

**Narrative Essays**

- **MacDonald 2003** - Family Physician

**Breastfeeding duration**

- Space
- Time

**Complications from inadequate milk expression**

- Milk Supply
- Duration of leave
- Colleague Support
- Harassment & Discrimination

**RoB**

- N/A
| Author      | Year | Journal                      | Type          | Text Presence | Video Presence | Podcast Presence | N/A Presence |
|-------------|------|------------------------------|---------------|---------------|----------------|------------------|-------------|
| Chretien    | 2008 | Annals of Internal Medicine  | Narrative Essay | Yes           | Yes            | Yes              | Yes         |
| Lawrence    | 2016 | Family Medicine              | Narrative Essay | Yes           | Yes            | Yes              | Yes         |