Social Inclusion
2025 • Volume 13 • Article 10435
https://doi.org/10.17645/si.10435

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Open Access Journal

Great Eggspectations: Narratives of Elective Oocyte Cryopreservation in Canadian Medical Journals

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Submitted: 29 March 2025 **Accepted:** 2 July 2025 **Published:** 3 September 2025

Issue: This article is part of the issue "Contemporary Changes in Medically Assisted Reproduction: The Role of Social Inequality and Social Norms" edited by Anne-Kristin Kuhnt (University of Rostock), Jörg Rössel (University of Zurich), and Heike Trappe (University of Rostock), fully open access at https://doi.org/10.17645/si.i523

Abstract

Also called oocyte cryopreservation or oocyte banking, "egg freezing" is an assisted reproductive procedure that allows people with ovaries to preserve oocytes for use in the future. "Medical egg freezing" has become established as a procedure for patients undergoing gonadotoxic chemotherapy or gynaecological surgery. In contrast, "social egg freezing" (SEF) is undertaken by patients with no current fertility issues in anticipation that they will be delaying childbearing. There is a sense that demand for SEF is growing, and it has been a rich case study for sociologists through lenses including medicalization theory, the nuclear family, intensive mothering, neoliberalism, ableism, and eugenics. Research presented in medical journals, recommendations made by clinical guidelines, and commentary and opinion pieces both reflect and shape the acceptability and availability of reproductive technologies. Therefore, the goal of this study was to explore narratives of SEF in Canadian medical journals and how these might shape medical perceptions of SEF. A qualitative, inductive content analysis of eight Canadian medical journal articles discussing SEF revealed key themes of "uncertainty," "ethical conflict," "age-related fertility decline," "extending fertility," and "technological advancement." A key finding of this study was that the boundaries between medical and social justifications for SEF are becoming blurred. On one hand, authors reframed SEF as a medical procedure indicated to manage age-related fertility decline (which is pathologized). On the other hand, authors upheld SEF as a potential solution to broad social problems, including delayed parenthood.

Keywords

Canada; content analysis; medical journals; medicine; social egg freezing

1. Introduction

Also called oocyte cryopreservation or oocyte banking, "egg freezing" is an assisted reproductive procedure that allows people with ovaries to preserve oocytes for use in the future. While "medical egg freezing" has a long history of being offered to patients undergoing gonadotoxic chemotherapy or gynaecological surgery, "social egg freezing" (SEF) is a more recent development. SEF is undertaken by patients with no current fertility issues in anticipation that they will be delaying childbearing. In other words, the goal of SEF is to sidestep age-related fertility decline.

In Canada, assisted reproduction regulations are developed, administered, and enforced by Health Canada under the Assisted Human Reproduction Act (Government of Canada, 2004). The AHRA does not specifically address elective egg freezing but does prohibit the purchase of oocytes and sets safety guidelines for the storage of oocytes. The availability of egg freezing has been greatly shaped by medical literature and professional associations. Beginning in 2013, several authorities in reproductive medicine—including the Canadian Fertility and Andrology Society (CFAS)—released position statements asserting they considered SEF to be a "well-established technique no longer considered to be experimental" (CFAS, 2014, p. 1). This was based on the development of vitrification, or "flash-freezing," which greatly increased frozen oocytes' chance of survival. For example, a 2021 American Society for Reproductive Medicine (ASRM) practice guideline found moderate evidence of no significant difference in pregnancy rates between fresh and frozen donor oocytes (49.8–60.9% for fresh donor oocytes, 50.2–63.2% for cryopreserved donor oocytes; Practice Committee of the American Society for Reproductive Medicine, 2021, p. 42).

Since this, elective oocyte cryopreservation has gained in momentum and popularity in Canada. Its rise, associated possibilities, and pitfalls have been chronicled in news media (see, e.g., Aziz, 2023; Braich et al., 2024; d'Oro, 2024; "The promise of egg freezing," 2019). In a 2012 study by Liu and Greenblatt, only nine clinics identified themselves as offering SEF. By 2021, one of the authors' graduate research (Michaud, 2021) found 26 clinics across Canada were now offering elective oocyte cryopreservation. Data presented by the Canadian Assisted Reproductive Technologies Register (CARTR) and the Better Outcomes Registry and Network (BORN) Ontario showed that, across Canada, there were 1758 oocyte retrieval cycles done for elective reasons in 2023 (CARTR-Plus & BORN Ontario, 2024)—a thirteen-fold increase from 2014 (CARTR-Plus & BORN Ontario, 2021). In comparison, 562 retrievals were completed for medical reasons in Canada in 2023 (CARTR-Plus & BORN Ontario, 2024).

Elective egg freezing is typically undergone in the same assisted reproductive technology clinics that treat infertile patients and provide in-vitro fertilization. It is paid for out-of-pocket by patients, as there is no provincial health plan coverage for this procedure. The *Canadian Medical Association Journal* (CMAJ) cites costs between 9000–17000 Canadian dollars per cycle, not including costs for storage (Gale et al., 2020).

There are a number of reasons for increased interest in egg freezing, but medical discourse—research presented in medical journals and at conferences, recommendations made by clinical guidelines, and commentary and opinion pieces—is key in shaping the accessibility and acceptability of egg freezing. For example, Stoop et al. (2014) argue in favour of reframing SEF as a preventative health intervention targeting "anticipated gamete exhaustion," which carries very different connotations from an "elective" procedure.

Clinics and clinicians, who ultimately act as gatekeepers to SEF, use medical literature in discussions with their patients. In addition, patients may research SEF using medical literature to inform their decision to forgo or proceed with SEF. Given this, the goal of this study was to explore narratives of SEF in Canadian medical journals. Our study was guided by the following research questions: How might narratives around SEF in Canadian medical journals shape medical perceptions of SEF? Which values or framings do these narratives prioritize?

2. Literature Review

SEF has been a rich case study for sociologists, who have tackled it with theoretical lenses ranging from medicalization theory to the nuclear family and intensive mothering, to neoliberalism, to ableism and eugenics. Based on international studies (see Inhorn, 2020), we know that the women turning to egg freezing are overwhelmingly highly educated, high-income professionals in their late thirties to early forties. In Canada, for example, 70% of oocyte retrievals for elective reasons occur in women between 35 and 40 years old (CARTR-Plus & BORN Ontario, 2024).

A number of qualitative studies have explored patients' reasons for undergoing SEF and their experiences freezing their eggs (see, e.g., Baldwin, 2019; Brown & Patrick, 2018; Carroll & Kroløkke, 2018; de Proost & Coene, 2022; de Proost et al., 2025; Inhorn et al., 2022; Myers, 2017; Zeno, 2022). The most common reason provided for egg freezing is generally the lack of a partner: either buying time to find the right person (Baldwin, 2019; Brown & Patrick, 2018; Carroll & Kroløkke, 2018) or being faced with the dissolution of a long-term relationship (Inhorn et al., 2022). Egg freezing may provide an opportunity to detangle biological, social, and emotional "timelines" and get back on course with an expected sequence of life events (Baldwin, 2019; Myers, 2017; van de Wiel, 2018; Waldby, 2019). Other authors note their participants' desire to accumulate life experience, financial stability, and a safe home before becoming mothers (Baldwin, 2019; Myers, 2017).

For some, increasing medical knowledge around reproduction provides more ways that women's bodies can "fail" at being fertile and conceiving, requiring heightened medical surveillance and intervention (Baldwin, 2019; Franklin & Ragoné, 1998). Authors have argued that with the advent of elective egg freezing, medicine has effectively created new "diagnoses" of "anticipated" (Martin, 2010) or "speculative" (van de Wiel, 2020) infertility. When anyone can (and will) become infertile at any moment, new responsibilities emerge to measure, manage, and optimize fertility through a plethora of new technologies (Baldwin, 2019; Martin, 2010; Myers, 2017). In some ways, this represents a continuation of "scientific motherhood" (Apple, 1995), a current which holds women morally responsible for the well-being of their families, yet expects them to engage and comply with expert scientific and medical advice.

Social scientists highlight that assisted reproductive technologies are more readily accepted when they assist or imitate "natural" reproduction (cf. Bühler, 2015; Franklin & Ragoné, 1998). Authors have explored representations of egg freezing across popular and news media (cf. Bhatia & Campo-Engelstein, 2018; Bühler, 2015; Campbell, 2011; Campo-Engelstein et al., 2018), professional association statements (Bhatia & Campo-Engelstein, 2018; Campo-Engelstein et al., 2018), and blogs (van de Wiel, 2018), and how these construct categories of acceptable and irresponsible types of technology-assisted motherhood.

Analysis of online information around SEF from medical clinics (for Australia, see Beilby et al., 2020; for the UK, see Gürtin & Tiemann, 2021; for Canada, see Liu & Greenblatt, 2012; Shao et al., 2020) has raised concerns around the lack of transparency regarding the medical risks and the "true" financial costs of SEF. There was marked ambiguity in how medical clinics defined and presented "successful" SEF, potentially leading to confusion for patients and clinicians. One factor is clinics' lack of their own data on live birth rates from frozen eggs and live birth rates from planned cryopreservation (Practice Committee of the American Society for Reproductive Medicine, 2021), given that very few women have returned to use them (Argyle et al., 2016; Beilby et al., 2020; Inhorn et al., 2022). In Canada, so far, only about 3% of women with frozen oocytes have thawed them for fertilization (CARTR-Plus & BORN Ontario, 2024).

Other than the analysis of fertility clinic websites, medicine's representations of SEF seem relatively understudied in the literature, and there were no studies on Canadian medical journals so far.

3. Methods

This qualitative content analysis examines how online Canadian medical journal articles represent SEF. Qualitative content analysis is a method used for the systematic analysis of social life through the close reading and coding of texts (Bernard, 2017; Hsieh & Shannon, 2005; Krippendorff, 2018). Content analysis moves beyond merely *describing* the content to study how topics are framed and the complex contexts in which they are read (Krippendorff, 2018).

3.1. Sample Characteristics

This study is based on eight online Canadian medical journal articles. Bibliographic details can be found in Table 1. Due to the narrow topic, the text corpus includes every article published on SEF in Canadian medical journals, as of June 2023. The date range was 2012–2021. Five of these were from the *Journal of Obstetrics and Gynecology Canada* (JOGC), two were from *CMAJ*, and one was from the *BC Medical Journal* (BCMJ). All articles were written in English. All were peer-reviewed articles. The sample including one commentary, one abstract, three articles, one clinical guideline, and two original research articles.

3.2. Inclusion/Exclusion Criteria

The main criterion for inclusion was a focus on elective egg freezing. Emily Michaud screened articles using their abstracts. For instance, four articles that discussed closely related topics of fertility decline, egg donation, and/or delayed parenthood, but did not mention SEF, were not analyzed.

3.3. Data Collection and Analysis

Data collection and analysis took place in June 2022. Based on her previous graduate research, author Emily Michaud used the search query "elective egg freezing" OR "social egg freezing" OR "elective fertility preservation" OR "elective oocyte cryopreservation" to retrieve articles from journal websites. She reviewed the journals' websites in June 2023 with the same query for any new publications to potentially add to the content analysis, with none found.

Table 1. Canadian medical journal articles included in content analysis.

Authors	Title	Journal	Year	Volume/Issue	Type
F. Baylis	*Left out in the cold: Arguments against non-medical oocyte cryopreservation*	JOGC	2015	37(1)	Commentary
L. Drost, S. Dason, C. Jones, J. Han, T. Doshi, A. Scheer, and E. Greenblatt	*Patients' and providers' perspectives on elective egg freezing decision-making: A needs assessment*	JOGC	2021	43(5)	Abstract
C. Dunne and J. Roberts	*SEF: A viable option for fertility preservation*	BCMJ	2016	58(10)	Article
J. Gale, A. A. Clancy, and P. Claman	*Elective egg freezing for age-related fertility decline*	CMAJ	2020	192(6)	"Practice" article
K. E. Liu and E. M. Greenblatt	*Oocyte cryopreservation in Canada: A survey of Canadian ART clinics*	JOGC	2012	34(3)	Research article
A. Petropanagos, A. Cattapan, F. Baylis, and A. Leader	*SEF: Risk, benefits and other considerations*	CMAJ	2015	187(9)	"Analysis" article
J. Saumet, A. Petropanagos, K. Buzaglo, E. McMahon, G. Warraich, and N. Mahutte	*No. 356-Egg freezing for age-related fertility decline*	JOGC	2018	40(3)	Clinical guideline
Y.-H. Shao, T. Tulandi, and H. A. Abenhaim	*Evaluating the quality and reliability of online information on social fertility preservation*	JOGC	2020	42(5)	Research article

Content analysis is "a set of methods for systematically coding and analyzing qualitative data" (Bernard, 2017, p. 321). Emily performed the content analysis, reading manuscripts closely and coding using NVivo 12 Pro. Codes emerged inductively during the coding and the author revisited, renamed, and re-hierarchized several times throughout this process, based on an evolving understanding of the data. Author Robin Oakley reviewed and provided input on the codebook.

3.4. Ethics

There was no Research Ethics Board approval required for this research, as it makes use of peer-reviewed articles available online.

4. Results

The full codebook can be found in the Supplementary File, including all themes, codes, and descriptions. Major themes, identified in nearly all articles, included "uncertainty," "ethical conflict," "age-related fertility decline," "extending fertility," and "technological innovation." This already conveys a sense of egg freezing

being a future-oriented procedure, full of ambiguities that blur the boundaries between social and medical indications of ART. Some other common codes were—in no particular order—"success depends on age," "physician role," "false hope," "no guarantees," and "women not using eggs."

4.1. The Blurring of the Social/Medical Divide

Journal articles generally differentiate "medical" egg freezing—for example, performed before gonadotoxic chemotherapy or gynecological surgery—from "social" egg freezing, requested by people with healthy ovaries. However, the medical risks of age-related fertility decline were often presented as a justification for freezing eggs at a younger age, blurring the social/medical divide. Many authors made use of statistics on infertility rates, measures of plummeting follicle and oocyte counts, reduced chance of conception with age, increased chance of abnormal embryos from older eggs at older ages, and increased medical risks for mother and baby.

In this way, normal age-related fertility decline became a medical problem that should trouble both physicians and patients. Some authors cautioned that patients may not even be aware of their dwindling fertility, framing delayed parenthood as a lifestyle issue requiring counselling. Dunne and Roberts (2016, p. 572) write:

> It is therefore incumbent on health care providers to educate women about the risks of advancing reproductive age and to ensure that patients are not "sleepwalking" into unintended childlessness. Women need to be made aware of the three main risks of delayed childbearing: infertility, aneuploidy, and miscarriage.

In line with the blurring of the medical and the social, articles that were targeted at a physician audience emphasized the holistic role of the physician in guiding patients wondering about SEF. There was an expectation that physicians engage with "the whole patient" and their social and emotional concerns, as well as potential ethical issues of SEF:

> Family physicians have a unique opportunity to assist women in accessing accurate and balanced information about their reproductive health. This information should be provided to all women who ask….Family physicians should frame discussions about this practice within the broader context of reproductive health and family-making to assist women in making informed choices. (Petropanagos et al., 2015)

> Prior to treatment, women considering social egg freezing should be counselled about the medical, physical, psychological, and financial aspects, and social risks/benefits of this technique and the alternatives listed above. (Saumet et al., 2018)

4.2. Facing Uncertainty With Optimization

Narratives around SEF reflected excitement around the development of oocyte cryopreservation. Authors described SEF as a "fast-changing technology" (Liu & Greenblatt, 2012, p. 254) and the advent of vitrification as "an exciting new frontier in reproductive medicine" (Dunne & Roberts, 2016, p. 573). This sense of innovation, however, existed in constant tension with uncertainty. In the interest of representing oocyte cryopreservation fairly, articles grappled with balancing the potential of the technology with its

limitations and available evidence. Articles were preoccupied with dispelling the myth of SEF being a guarantee or "fertility insurance policy." Freezing eggs may lead to other murky problems:

> There is the risk of basing future decisions/behaviour on the assumption that one's frozen eggs will ensure future fertility. Clearly, those eggs may or may not survive the thaw, they may or may not fertilize, and they may or may not produce viable embryos. (Saumet et al., 2018, p. 363)

Articles attempted to define an optimal outcome to SEF by providing algorithms for success based on age, cost, number of cycles, and oocytes frozen.

Authors cautioned that SEF could lead to false hope or a false sense of security in patients who are not fully informed about the uncertainties of this technology. One concern was that freezing eggs would require a cascade of further steps, or interventions, to be used, multiplying the costs, and the ambiguities. This is illustrated by Baylis (2015, p. 65):

> Oocyte preservation is at best a halfway technology….Oocytes in storage are of no personal value to a woman who wants to make a baby unless she chooses to reproduce using IVF. In many ways, therefore, consenting to oocyte cryopreservation is but a first step on the path to future IVF.

Along similar lines, six articles warned that many women have not returned to use their frozen eggs. Authors implied the procedure may be unnecessarily wasteful and/or risky unless banked oocytes lead to a pregnancy.

4.3. Progress in Service of Tradition

The articles analyzed generally did reaffirm—indirectly and directly—the importance to patients of having a healthy child who is biologically theirs. For example, Petropanagos et al. (2015) state: "Social egg freezing…provides [women] with the possibility of becoming a genetic parent using their frozen–thawed eggs, and it reduces the risk of having children with chromosomal abnormalities associated with ovarian aneuploidy" (p. 667). Genetic kinship and health were often grouped in these narratives, with SEF offered as a solution for both.

The same authors acknowledge that SEF "reinforces assumptions about the value of having genetically related children, which may not be of equal importance to all women" (Petropanagos et al., 2015, p. 668). However, these authors were in the minority. Few articles discussed alternate, non-biological mothering options such as adoption or using donor eggs.

Articles described broader Canadian demographic and social trends to contextualize increasing interest in SEF. Examples included Canadians choosing to start families later in life, experiencing conflicting timelines, being "forced to choose" between parenting and career, or feeling socially pressured to become mothers. While articles referenced these social issues to explain why SEF is in demand, progressive but non-medical solutions—such as policy changes to childcare or parental leave programs—were not suggested. The focus was generally on medical choices to be made by the informed and self-sufficient individual or couple. To be fair, discussion of social policy may have been outside the scope of medical journal articles.

5. Discussion

The key finding of this content analysis was that Canadian medical journal articles legitimized the use of a medical procedure in an otherwise-healthy population by framing it as a treatment for managing age-related fertility decline. The ticking biological clock is pathologized, providing a justification for SEF. In her 2010 paper, Martin referred to a clear delineation between representations of "medical" and "social" egg freezers in mainstream and scientific media. Our data suggests a possible evolution of this dichotomy, at least in this sample of Canadian medical literature. Here, SEF settles into an ambiguous position somewhere between medically necessary procedure and elective lifestyle decision. Fertile/infertile and pregnant/not pregnant divides become fractured. The focus on age-related fertility decline creates a sense of urgency to proactively seek out medical management.

Our data reflects ongoing tension between technological innovation and the creation of new uncertainties in the field of assisted reproduction. Excitement around the technical innovation of oocyte cryopreservation was also a feature of the website analyses performed by Beilby et al. (2020) and Gürtin and Tiemann (2021). These authors note that the language of technological progress creates an illusion of clarity while obfuscating information that could be helpful to patients and clinicians. In the articles we analyzed, it remained ambiguous at what point to call SEF a success, or indeed how to measure its success: Is it so based on the number of eggs frozen, on a successful pregnancy, or a successful live birth (which requires further treatment, including IVF)?

In line with the blurring of the medical and the social, articles emphasized the holistic role of the physician in guiding patients wondering about SEF. In the transition to "scientific motherhood" (Apple, 1995), women are held responsible for the well-being of their families, yet expected to engage and comply with expert scientific and medical advice. This is reflected in our data as well: Narratives around SEF implied that would-be mothers should be assuming responsibility for optimizing their biological clock, according to expert medical knowledge. This framing of fertility as something to be optimized creates new burdens (Baldwin, 2019). In our data, however, physicians were asked to allow information flow in the other direction—to engage with "the whole patient" and their social and emotional concerns. This represents somewhat of a departure and an attempt to de-medicalize the counselling encounter.

Authors have recently argued that SEF is a purely medical phenomenon and, therefore, that the term "SEF" should be retired (Hirsch et al., 2024). But what is medicine without social considerations? Our data reflects medical and ethical concerns around SEF as a "halfway technology" (Baylis, 2015)—that banked oocytes are valueless unless they result in a clinical pregnancy. On the contrary, in the literature, sociologists have provided compelling arguments that oocytes inherently have deeply personal value to the women who freeze them. As one example, oocytes embody "generational time" (Waldby, 2019): They are meaningful because they connect women with past generations through the genetic line, while carrying the potential for future children. Having oocytes banked provided the women in Baldwin's (2019) research with freedom in their lives and romantic relationships, even if their oocytes were never used.

Sociologists have argued that broader destabilization and de-traditionalization of the life course have set the stage for elective egg freezing. "Getting back on course" with an expected sequence of life events is a key factor in the decision to freeze oocytes (Baldwin, 2019; Brown & Patrick, 2018; Myers, 2017; van de Wiel, 2018; Waldby, 2019). The medical literature examined also frames the rise of SEF as due to a disconnect

between biological and social timelines. However, rather than opening up new trajectories for fertility and mothering, our data showed SEF being portrayed as a technology for restoring very traditional goals: biological kinship, able-bodied children, and the nuclear family. Medicine may perceive from this narrative that biological motherhood is the most acceptable to women who are considering freezing eggs (cf. Melhuus, 2012). Indeed, authors have previously shown how egg freezing, which enables "unnatural" motherhoods—such as post-menopausal or posthumous reproduction—or children with more than two parents, is vilified (Bühler, 2015; Campbell, 2011; Melhuus, 2012).

5.1. Limitations

This study is limited by the small number of articles available on the topic. In addition, while medical journals are convenient for textual analysis, clinicians obtain and share information through many other mediums, including online resources, conferences, teaching, textbooks, and in-person discussion. Given the small number of articles on SEF in Canadian journals, it is likely that Canadian clinicians also make use of US and European materials, which were excluded from this study. Furthermore, while it examines how SEF is being represented to and by physicians, this study cannot provide insight into how medical literature actually shapes the day-to-day reality of clinicians' practice.

To assume that these articles represent a single, inherent truth would be falling into the trap of textual determinism (Franklin & Ragoné, 1998). Content analysis data is always dependent on the author's interpretation. By allowing codes to emerge based on the data, we hoped to reduce the impact of any preconceived notions on our findings. While qualitative content analysis cannot exhaust all possible interpretations of the data, when done rigorously, it provides reliable data and has even been used in court cases (see Bernard, 2017).

SEF is still a relatively new development in the field of assisted reproduction, and there is still much unknown. The data collected represents a snapshot in time of medical discussion around SEF. We expect representations of egg freezing to continue to shift and evolve over time.

6. Conclusion

The goal of this study was to explore the values/framings of SEF contained in Canadian medical journals and how these might shape medical perception of SEF. The analysis of journal articles showed medical discourse frames so-called "social" egg freezing as a treatment for pathological age-related fertility decline. The articles reflect tension between a constant drive for optimization and the uncertainties of infertility—a tension which creates more and new uncertainties. Medical articles also framed SEF as one solution to broad social and demographic developments changing the course of parenthood. In expecting physicians to engage with "the whole patient" and their social constraints, the boundaries between medical and social infertility continue to blur. In terms of shaping perceptions and practices by medicine, these narratives could contribute to broadening the indications for egg freezing, and impact which patients could be seen as suitable candidates. This topic could benefit from future research into Canadian medical professionals' beliefs and practices around SEF, analysis of other types of medical media, or an anthropological study of patient–clinician encounters.

Acknowledgments

The authors thank the Research in Medicine Program at the Dalhousie Faculty of Medicine, as well as the Department of Sociology and Social Anthropology at Dalhousie University.

Funding

The authors wish to gratefully acknowledge financial support through the Dalhousie Faculty of Medicine's Ross Stuart Smith Research in Medicine Summer Studentship and Research in Medicine Knowledge Translation Fund.

Conflict of Interests

The authors declare no conflict of interest.

Data Availability

Data available from the corresponding author on request.

LLMs Disclosure

No LLMs were used throughout this project; specifically, no LLMs were used for data collection, data analysis, or in the preparation or editing of this manuscript.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

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