

# Literature Review on Women's Knowledge and Attitudes Toward Oocyte Cryopreservation

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DOI: <https://doi.org/10.36348/sjls.2025.v10i10.003>

| Received: 10.09.2025 | Accepted: 04.11.2025 | Published: 06.11.2025

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## 1. Abstract

**Background:** Non-medical oocyte cryopreservation (NMOC), also known as elective egg freezing, has become an established reproductive option that enables women to preserve fertility for social or personal reasons. Assessing women's knowledge and attitudes toward NMOC is critical for enhancing awareness, supporting informed decision-making, and refining counseling practices. **Objective:** This literature review synthesizes current evidence regarding women's knowledge, attitudes, and influencing factors related to NMOC, with particular emphasis on gaps identified among Saudi women. **Methods:** A systematic search was performed in PubMed, Medline Plus, Web of Science, and Google Scholar for studies published from 2020 to 2024. Of the 260 articles initially identified, 23 met the inclusion criteria. Each study was analysed based on its aim, setting, sample size, and key findings. Thematic synthesis was used to organize results into four main areas: knowledge and attitudes toward NMOC, factors influencing women's decision-making, factors affecting attitudes, and sources of information. **Results:** The findings indicate that most women possess limited knowledge of NMOC, particularly concerning optimal age, success rates, and medical procedures. However, attitudes toward NMOC are generally positive, especially among highly educated, employed, and medically trained women. Variables such as age, marital status, education, income, fertility awareness, and cultural or religious beliefs significantly influence both knowledge and attitudes. Online resources and healthcare professionals are the primary sources of information shaping women's understanding. **Conclusion:** Although global awareness of NMOC is increasing, significant gaps remain, particularly among Saudi women. Future research and culturally tailored educational initiatives are necessary to improve women's reproductive literacy, facilitate informed choices, and support equitable access to fertility preservation counselling.

**Keywords:** Non-medical oocyte cryopreservation, elective egg freezing, fertility preservation, knowledge, attitudes, Saudi women, reproductive decision-making.

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## 2.1 INTRODUCTION

In this chapter, the researcher conducts a complete literature review encompassing all relevant current studies on this topic. The initial subject highlights the technique for the review, involving the search strategy and engine, search keywords, inclusion and exclusion criteria, as well as the processes for data extraction and management relevant to the review's results. The final section provides an outline for major results, the literature gap and limitations.

## 2.2 METHODS OF THE REVIEW

In order to investigate the knowledge and attitude of Saudi Females towards elective non-medical Oocyte Cryopreservation (NMOC), a thorough and comprehensive literature review was undertaken. This

review aimed to identify the most suitable and reliable peer-reviewed sources that effectively address the research objective.

The following section will provide further explanation of the process of generating a body of knowledge through defining inclusion and exclusion criteria, search strategies, search keywords, and evidence selection methods.

### 2.2.1 Search Strategy

A two-step search method was implemented to identify relevant articles relating to the research topic. The initial phase entailed a comprehensive examination of full-text articles on search engines. The process consisted identifying potential sources, assessing their

relevance, and evaluating the reliability of the information inside the references.

Upon identifying a viable source, the title was evaluated for eligibility. further, the abstract's content was reviewed to ensure its relevance and suitability for the research, further refining it to the most pertinent elements for evaluating females' knowledge and attitude towards elective NMOC. The subsequent phase entailed a manual examination of the reference lists and bibliographies of the initially acquired research to uncover additional papers that may have been neglected in the databases.

### 2.2.2 Search Engines

Related articles were retrieved by conducting searches across the Saudi Digital Library (SDL) for the specified electronic databases: Medline Plus, Web of science and PubMed. These databases have been determined for their capacity to offer high-quality content appropriate for evaluation of literature, namely within the field of healthcare (Oermann et al., 2021). Furthermore, Google Scholar was considered as a secondary source.

### 2.2.3 Search key terms

A variety of research terms, including medical subject headings (MeSH) and associated terminology, were utilized in multiple combinations. The terms utilized in the review were knowledge, education, understanding, awareness, attitudes, Female, non-medical, elective, oocyte cryopreservation and freezing egg with the application of Boolean operators "and," "or," and "not" to structure and integrate sentences.

### 2.2.4. Inclusion and Exclusion Criteria

#### Inclusion Criteria

The criteria for inclusion in this review are as follows.

- To narrow down on the latest literature, the review assessed articles published between 2020 to 2024.
- Peer-reviewed article addressing the knowledge and attitudes of females on NMOC
- Published in English language.
- This review will examine qualitative, quantitative, mixed-methods, and systematic review studies.

#### Exclusion Criteria

The subsequent criteria for exclusion were as follows:

- Articles that examine NMOC in the context of male knowledge and attitudes.
- Editorials, conference abstracts, notes, letters, comments, and descriptive reports, along with grey literature sources, are deemed unreliable due to their dependence on perspectives from individuals who have not undergone rigorous evaluation to substantiate judgments and conclusions.

### 2.3 Study Selection Process

The initial phase involved searching using keywords and narrowing the electronic database using inclusion criteria, resulting in a total of 260 probable outcomes. 21 articles were obtained from MEDLINE Plus, 23 Web of science, 44 from PubMed, and 172 from Google Scholar. After the removal of duplicate article, the total was 239. The articles were subsequently evaluated for eligibility based on their title, abstract, and full text content. A total of 69 articles were selected. The researcher subsequently examined each study to determine its main findings. Ultimately, researcher chose 23 articles for inclusion in this review. The PRISMA flow diagram (Figure 2.1) illustrates the search methodology and article selection criteria.

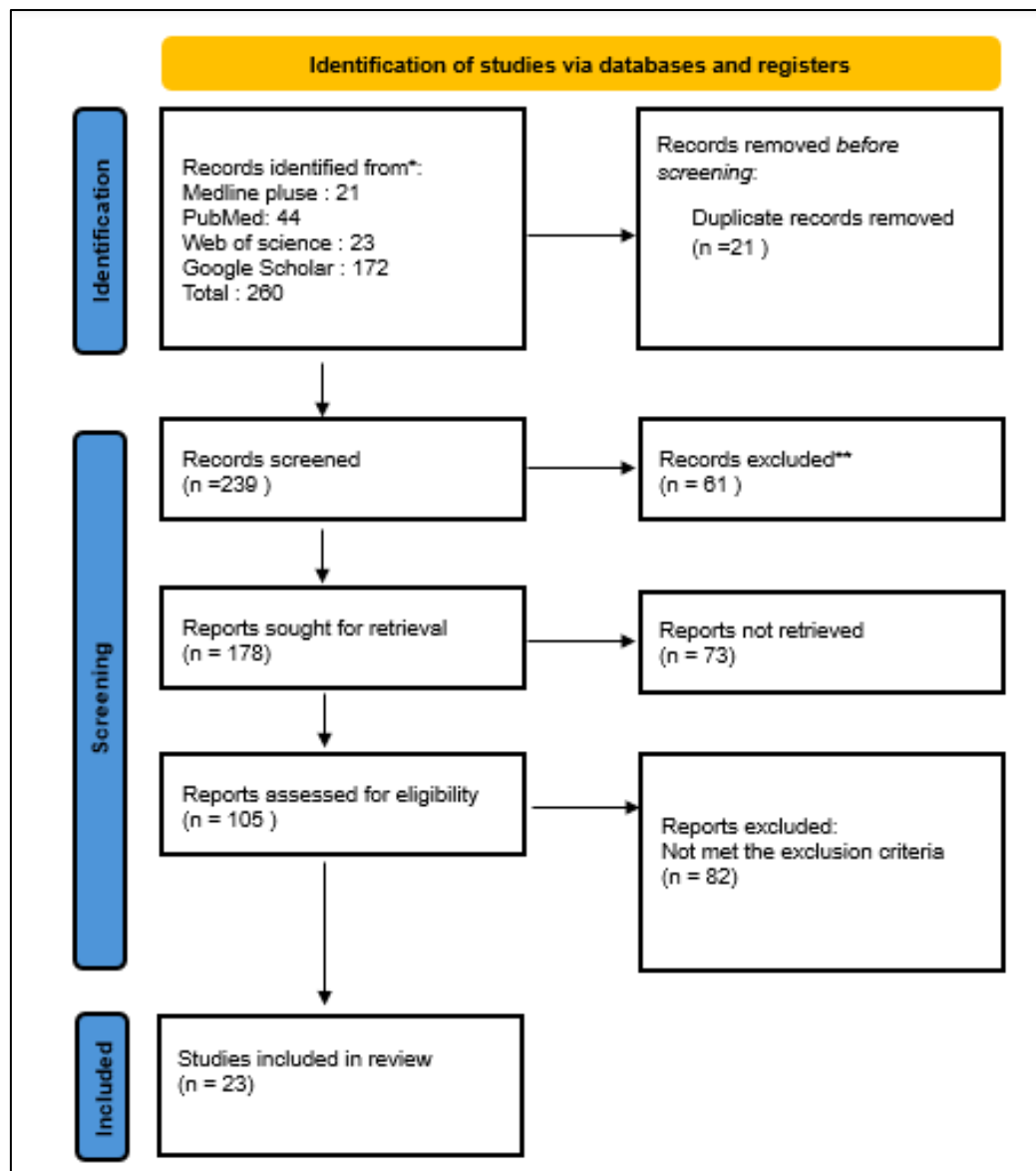


Figure 2.1: PRISMA 2020 Flow Diagram (Page *et al.*, 2021)

## 2.4 Data Extraction and Management

Data extraction for reviews requires gathering all relevant information from included studies to address the study question and acquire relevant data (Schmidt *et al.*, 2023). The data obtained from each article included the author(s), publication year, study objective, design, setting, sample size, participant type, and main conclusions of the study. A literature review matrix template was used to obtain the necessary data (Appendix 1). The utilization of a matrix facilitated the finding of relevant themes and the subsequent evaluation of the selected article. The extracted data contained 17 article quantitative, 3 systematic review, one literature review, one qualitative and one mixed-method.

## 2.5 MAIN FINDINGS / RESULTS

Twenty-three articles have been selected, analysed, and categorized based on their conceptual or descriptive similarities. Data were collected, compared,

summarized, and subsequently evaluated across and within research studies to uncover themes from the existing literature concerning the knowledge and attitudes of females regarding oocyte cryopreservation. As a result, four major themes emerged: "knowledge and attitude of women regarding NMOC.", "Factors impacting women's decision-making regarding NMOC.", "Factor affecting women's Attitude regarding NMOC." and "source of information regarding NMOC."

### 2.5.1 knowledge and attitude of women regarding NMOC

Extensive research has explored women's awareness and perspectives on non-medical oocyte cryopreservation (NMOC), revealing a spectrum of views influenced by educational background, cultural norms, and access to fertility-related information. For example, a cross-sectional study conducted at the Royan Institute in Tehran, Iran by Hafezi *et al.*, (2022) assessed

the knowledge and attitudes of 216 female applicants regarding social egg freezing. This study highlighted significant gaps in understanding the implications of age-related fertility decline and the technical processes involved in egg freezing. Despite these knowledge gaps, participants generally exhibited positive attitudes, primarily driven by a strong preference for biological motherhood over alternatives such as adoption or donor conception. These findings underscore the complex interplay between knowledge deficits and attitude formation in this context.

Similarly, Saadia *et al.*, (2024) examined 437 women of reproductive age in Al-Qassim, Saudi Arabia, to assess their awareness and perception of NMOC. Their findings showed that although many women recognized social egg freezing, a substantial proportion felt insufficiently informed. Notably, higher educational attainment was strongly associated with more positive views and greater understanding of the procedure, echoing trends observed in other regions.

Further supporting this, a systematic review by Platts *et al.*, (2021) in the United Kingdom analyzed data from 35 studies evaluating public and user perceptions of elective oocyte cryopreservation (EOC). The review concluded that women who had undergone or considered EOC were generally well-informed about procedural aspects, whereas public awareness remained limited—especially regarding age-related fertility decline and success rates. This persistent information gap between users and the broader public is a recurring theme. Similarly, Armstrong *et al.*, (2023) surveyed 520 female medical students in the United States, finding that while participants had a general awareness of oocyte cryopreservation, they often lacked accurate knowledge of success rates, costs, and medical risks. Nevertheless, most expressed positive attitudes and intentions to consider the procedure for future fertility preservation, signaling growing openness among younger, educated women. In Ghana, Osaah *et al.*, (2024) assessed 402 female college students and found low knowledge levels but generally positive perceptions of egg freezing, attributing these attitudes to sociocultural and religious influences that may limit open discussion about fertility preservation and shape acceptance of reproductive technologies.

Studies from Asia and Europe further illustrate these patterns. In China, Zhou *et al.*, (2022) surveyed 1,236 female university students, both medical and non-medical. Nearly half lacked adequate understanding of the advantages and disadvantages of oocyte cryopreservation; however, 36.9% still indicated approval, and medical students in particular demonstrated notably more favorable attitudes. Likewise, Kasaven *et al.*, (2023) conducted a comprehensive study in the United Kingdom involving 1,000 women, which showed increased knowledge of oocyte cryopreservation for cancer patients, though

considerable deficiencies persisted—especially regarding success rates and procedural details.

Sayegh *et al.*, (2023) investigated the knowledge and attitudes of 278 women who received fertility consultations in the United Arab Emirates and found insufficient understanding of planned oocyte cryopreservation (POC), particularly around hormonal protocols and oocyte viability. Women with higher education in health-related fields displayed greater knowledge and more positive attitudes. In Portugal, Nunes *et al.*, (2024) evaluated 350 women and observed limited knowledge about fertility preservation options, yet many participants expressed an eagerness for further information, highlighting potential receptiveness to NMOC initiatives.

Sandhu *et al.*, (2023) examined the attitudes of 120 Australian women seeking information about elective egg freezing, finding limited awareness of success rates and potential health hazards. Nonetheless, the participants' proactive approach to seeking information reflected generally positive attitudes. In Lebanon, Ghazeeri *et al.*, (2023) studied 318 women visiting reproductive health clinics and found inadequate procedural knowledge but unexpectedly high acceptability of NMOC, suggesting a gradual shift in cultural perspectives.

Akhondi *et al.*, (2023) investigated the knowledge and attitudes of 470 Iranian university students from diverse academic fields. The study indicated limited knowledge of the costs, duration, and consequences of oocyte cryopreservation, especially among individuals not majoring in health-related fields, regardless of mostly positive attitudes.

Some studies in North Africa offer additional insights. Sewidan & Abd Elhamid (2023) surveyed 389 female students at Suez University in Egypt, noting high levels of awareness and positive attitudes, especially among those in medical faculties. Fahmy & Mohamed (2021) also found that, although 60% of 310 unmarried nursing students in Egypt had insufficient knowledge, many showed a strong interest in further education, pointing to a cautiously positive outlook.

Overall, these studies suggest that while knowledge gaps about NMOC remain widespread across different populations, women tend to display favorable or cautiously supportive attitudes—especially those with medical backgrounds or higher educational attainment. This consistent pattern highlights the importance of targeted educational efforts to bridge knowledge gaps and further empower informed decision-making.

## 2.5.2 Factors impacting women's decision-making regarding NMOC

The literature thoroughly investigates multiple factors that affect women's decision-making regarding

egg freezing methods. For example, in a cross-sectional study, the main factors affecting decisions to freeze oocytes included offspring health, absence of an appropriate spouse, socioeconomic circumstances, employment, educational conditions, and concern regarding being alone in advanced age (Hafezi *et al.*, 2022).

In addition, Platts *et al.*, (2021) systematic review states that the biggest drive for women to engage in OFNMR was the absence of an appropriate spouse for procreation. The high cost was recognized as a major obstacle to the utilization of OFNMR. The systematic review emphasized that societal perceptions, media representations, and misconceptions regarding fertility and age-related decline substantially impact women's choices regarding OFNMR. Furthermore, Saadia *et al.*, (2024) revealed that women with advanced education degrees demonstrate more comprehension and more positive attitudes towards the process.

In the United States, a cross-sectional study highlighted that the factors impacting decision-making identified by all participants were the health of the children, possibility of success, desire for a child, and preservation of fertility (Armstrong *et al.*, 2023).

In accordance with earlier studies, Kynigopoulou *et al.*, (2024) conducted a Literature Review of 73 articles. The review aimed to provide an overview of the societal factors that prompt women to consider egg cryopreservation, along with their attitudes toward and understanding of this procedure. According to the findings, the phenomenon of "Egg Cryopreservation for Social Reasons" indicates that an increasing percentage of women are choosing to freeze their eggs mostly due to social considerations, including the absence of a suitable spouse, professional development, and financial instability.

In 2020, Johnston *et al.*, (2020) conducted a cross-sectional study on 656 female participants in Australia with the primary goal of investigating public perceptions of both medical and non-medical egg freezing, evaluating the determinants shaping these perceptions, and comprehending the ramifications of egg freezing on family planning and reproductive decisions. The study's findings revealed that participants' desires for parenthood influenced their perspectives on oocyte cryopreservation. The research also revealed that cost constitutes an important obstacle to accessing egg freezing services, with participants indicating a preference for these services to be offered at reasonable costs.

Also, Osaah *et al.*, (2024) indicated that participants would consider preserving fertility owing to the potential of having a biological child in the future. Furthermore, Zhou *et al.*, (2022) indicated that the extended academic timeline in medical education often

leads to the postponement of important life events, such as marriage and childbirth, prompting medical students to consider oocyte cryopreservation as a viable option.

Moreover, five more studies proved that financial burden is seen as a significant barrier to pursuing oocyte cryopreservation. (Kasaven *et al.*, 2023; Sayegh *et al.*, 2023; Arendt & Oxlad, 2023; Akhondi *et al.*, 2023 ; Sewidan & Abd Elhamid, 2023)

A quantitative study in Portugal by Nunes *et al.*, (2024) examined women's motivations, barriers, and attitudes regarding elective oocyte cryopreservation. The study found that 56.3% of participants would consider egg freezing to prevent age-related fertility decline, and 26.3% would do so due to the absence of a partner. Financial concerns were the primary barrier for 32.5% of respondents. Additionally, 68.9% expressed disinterest in oocyte cryopreservation, citing limited awareness, reluctance, and anxiety about aging.

Tandoğan *et al.*, (2023) conducted a qualitative study in Istanbul, Turkey, involving 12 unmarried academic women to examine factors influencing their decisions regarding oocyte cryopreservation. The participants generally viewed the procedure as a valuable means of preserving fertility. However, their decision-making was influenced by several concerns, such as uncertainty about the likelihood of successful pregnancies using frozen oocytes and moral discomfort associated with assisted reproductive technologies. In addition, sociocultural expectations related to marriage and motherhood played a significant role in shaping their willingness to consider egg freezing. Similarly, Sandhu *et al.*, (2023) carried out a cross-sectional survey in Australia with 332 women to assess decision-support needs for elective oocyte cryopreservation. The findings indicated that many women were hesitant to pursue the procedure due to limited knowledge of its success rates and potential health risks. Participants expressed a preference for receiving accurate, evidence-based information from healthcare providers and reliable online sources, particularly before the age of 30. Taken together, these studies suggest that women's decisions about non-medical oocyte cryopreservation are influenced by a combination of individual motivations, informational limitations, emotional uncertainty, and sociocultural factors.

In 2023, Ghazeeri *et al.*, conducted a cross-sectional study in Lebanon, revealing significant concerns among women regarding the safety of the procedure for potential children and its implications for future fertility. Women aged 18-30 were shown to be 2.09 times more predisposed to consider egg freezing than those aged 31-39. Moreover, unmarried women were 4.31 times more inclined to consider sterilization than their partnered counterparts, while childless women were 5.00 times more predisposed in comparison to those with children.



In alignment with previous studies, a cross-sectional study was conducted by Güngör Satılmış *et al.*, (2022) involving 342 Turkish midwifery and nursing students to assess their knowledge and attitudes towards oocyte cryopreservation. Researchers have identified several factors influencing the decision to consider social egg freezing, including career prioritization, the desire to delay childbirth due to a lack of acceptable partners, and personal preparedness.

Kostzer *et al.*, (2021) employed Q-methodology in the Netherlands to explore the perspectives of 34 women of reproductive age on oocyte cryopreservation. Participants ranked statements according to their level of agreement, which helped identify prevalent viewpoints. The study revealed that women's choices were shaped by multiple factors. Some expressed caution and ethical concerns regarding the procedure and traditional notions of motherhood. Others prioritized autonomy, seeing egg freezing as an option to exercise reproductive control. Overall, the findings indicate that decisions about non-medical oocyte cryopreservation are influenced by practical considerations, knowledge, ethical values, personal beliefs, and social attitudes.

In his systematic review, Hathaway (2021) examined and analyzed 20 studies on women's motivations and experiences concerning assisted reproductive technologies, specifically elective oocyte cryopreservation, and its consequences within societal norms and reproductive choices. The results suggest that over 80% of women mentioned the absence of a committed partner as a significant reason for opting for social egg freezing (SEF). Additionally, many women have an increased sense of urgency due to declining fertility with increasing age. Many women reports feeling empowered by exercising control over their reproductive decisions. Cultural conventions surrounding family and parenting can influence decisions regarding egg freezing. Although not the dominant perspective, some women perceive SEF as a means to prioritize their professions before starting a family. The need for financial security before procreation serves as an additional motivating factor. Concerns regarding personal health and fertility may lead women to consider SEF as a viable option.

A descriptive research design was carried out by Fahmy, G., & Mohamed, H. (2021) revealed many challenges faced by participants regarding egg freezing in Egypt. Approximately 75% of the students recognized the anxiety of their future husbands' possible rejection as a significant barrier to considering egg freezing. Approximately 73.3% of respondents recognized cultural perspectives as substantial barriers affecting their decision to consider egg freezing.

In alignment with prior research, a systematic review conducted by Nasab *et al.*, (2020) in the USA

aimed to examine women's perspectives and motivations regarding elective oocyte cryopreservation, encompassing 22 articles. noted that possible motivations for choosing to preserve oocytes included desiring additional time to select a suitable partner, economic stability and career advancement, and concerns about future fertility. Numerous women expressed that the ability to defer parenthood allowed them to achieve personal and professional success before having children. The review also mentioned factors that interfere with the decision about the egg freezing method and concerns regarding physical discomfort and possible consequences associated with the procedure.

### 2.5.3 Factors Affecting Women's Attitudes on NMOC

A wide range of research has investigated the factors influencing women's attitudes toward NMOC. In Tehran, Iran, Hafezi *et al.*, (2022) revealed that the desire for biological motherhood was a primary motivator of favorable attitudes among 216 women contemplating social egg freezing, indicating significant cultural tendencies towards standard family structures. In a study of 437 women in Al-Qassim, Saudi Arabia, Saadia *et al.*, (2024) found that elevated educational levels significantly impacted positive attitudes and improved awareness of NMOC.

Armstrong *et al.*, (2023) discovered that 520 female medical students in the United States indicated an interest in egg freezing, motivated by knowledge of age-related fertility decline and career considerations. A literature review by Kynigopoulou *et al.*, (2024), synthesizing findings from 25 worldwide studies, revealed divergent attitudes: some women demonstrated interest in NMOC, while others articulated concerns regarding medical risks, limited success rates, and ethical difficulties. The analysis highlights the urgent need for enhanced fertility education.

In Sweden, Gambadauro *et al.*, (2023) conducted a study of 270 women to evaluate their perceptions of egg freezing for medical and social purposes. Although both scenarios received support, acceptance was greater for medical indications. Participants' willingness to pay (WTP) fluctuated and was influenced by financial considerations. In Scotland, Johnston *et al.*, (2020) conducted a poll of 500 women aged 25–45 years, revealing that younger women, particularly those aged 30–39 years, and individuals with postgraduate degrees exhibited more support for the NMOC, underscoring the influence of age and education.

Zhou *et al.*, (2022) found that medical students in China exhibited greater support for egg freezing than their non-medical counterparts in a sample of 1,236 university students. Tandoğan *et al.*, (2023) conducted a study of 412 women in Turkey and found predominantly positive attitudes, especially among those knowledgeable about fertility technology.

Arendt and Oxlad (2023) carried out a cross-sectional study in Australia with 514 women to explore their attitudes toward non-medical oocyte cryopreservation (NMOC) and the factors influencing these views. Results showed that most participants held moderate to high acceptance of NMOC. Favourable attitudes correlated with personal reproductive goals and career plans, suggesting that women aiming to prolong fertility while pursuing professional or personal ambitions tended to view NMOC positively. Conversely, negative or uncertain perspectives were mainly driven by concerns over costs, identified as a major obstacle, along with medical and ethical issues related to egg freezing. These results indicate that perceptions of NMOC are shaped by individual goals, financial concerns, and attitudes toward the procedure.

In Lebanon, Ghazeeri *et al.*, (2023) found unexpectedly elevated acceptability levels among 318 women, indicating shifting cultural attitudes, even in more traditional environments. (Akhondi *et al.*, 2023; Sewidan & Abd Elhamid, 2023) Likewise, substantial support was found among university students in Iran and Egypt, especially in health-related disciplines. G. Fahmy & H. Mohamed (2021) observed that, despite knowledge gaps among 310 nursing students, their attitudes remained positive and hopeful. Finally, Nasab *et al.*, (2020) conducted a study including 400 Iranian women, revealing favorable opinions on fertility preservation, particularly among younger and more educated individuals.

These data suggest that women's attitudes towards NMOC are influenced by a complex interaction of factors, including age, education, cultural background, financial considerations, and exposure to health education.

#### 2.5.4 source of information regarding NMOC

The literature review highlights the source of information as a factor influencing the level of knowledge and attitudes towards NMOC. For instance, a systematic review by Platts *et al.*, (2021) demonstrated that cultural beliefs, media representations, and misconceptions regarding fertility and age-related decrease significantly influence women's decisions on OFNMR.

A cross-sectional study conducted in Ghana by Osaah *et al.*, (2024) demonstrated that the primary sources of knowledge on fertility awareness for the respondents were health professionals (33.33%), the Internet (30.37%), and television (14.81%). The source of information influenced the participants' knowledge, as their understanding of egg freezing was limited.

In addition, a quantitative study conducted in Portugal by Nunes *et al.*, (2024) illustrated a substantial desire for additional information, with 82.1% of participants wishing for healthcare practitioners to discuss fertility preservation options during consultations. A cross-sectional study conducted in Australia by Sandhu *et al.*, (2023) demonstrated that participants expressed a preference for receiving planned oocyte cryopreservation information by the age of 30, particularly from healthcare practitioners and online resources. Additionally, Akhondi *et al.*, (2023) conducted a cross-sectional study in Iran to evaluate the knowledge and beliefs of 1,279 female university students regarding oocyte cryopreservation for medical and social reasons. While most participants expressed positive attitudes toward egg freezing, their understanding of its implications, associated costs, and optimal timing was limited. The majority (95.5%) agreed that healthcare providers should routinely inform women of reproductive age about egg freezing during medical consultations. These findings suggest a need for professional guidance and structured fertility counseling. In a similar cross-sectional study, Sewidan and Abd Elhamid (2023) surveyed 1,279 female medical students in Egypt and found a moderate level of awareness and generally positive attitudes toward oocyte cryopreservation. Cost emerged as a significant factor influencing decision-making. Participants also indicated that healthcare personnel should regularly provide information about egg freezing during routine health consultations. Collectively, these studies emphasize the critical role of healthcare professionals in disseminating reproductive health information and highlight the necessity for systematic educational initiatives to address existing knowledge gaps.

#### 2.6 Knowledge Gap

Numerous international studies have examined the knowledge and attitudes of oocyte cryopreservation, including one conducted in Al-Qassim, Saudi Arabia. Nonetheless, the literature assessment performed through electronic databases uncovered a research gap regarding the knowledge and attitudes of oocyte cryopreservation across Saudi Arabia.

#### 2.7 Limitations of the Included Literature

This literature review is constrained by the possible omission of relevant research due to the limitations of the English-language publication search criteria. Furthermore, it is conceivable that certain studies were not excluded due to the utilization of varied terminology to characterize knowledge and attitudes regarding oocyte cryopreservation. Moreover, research aimed at evaluating the knowledge and attitudes regarding egg freezing in males were omitted.

## Appendix 1

Study reference	Research setting and country	Study aim	Study design	Participant	Main finding
(Hafezi <i>et al.</i> , 2022)	Tehran, Iran at Royan Institute	The objective of the study was to evaluate the knowledge and attitudes of female candidates for social egg freezing (SEF) concerning fertility, motherhood, and the implications of oocyte cryopreservation . It aimed to comprehend the elements affecting their decisions on fertility preservation.	cross-sectional study with a questioner	216 women participated	There is exist significant deficiencies in women's knowledge regarding age-related fertility decline and the process of egg freezing. Main factors affecting decisions to freeze oocytes included: The offspring health Absence of an appropriate spouse Socioeconomic circumstances Employment and educational conditions Concern regarding alone in advanced age Expenses related to oocyte cryopreservation and in vitro fertilization Cultural Perspectives The preference for a biological child was emphasized above adoption or donor conception, reflecting a significant societal inclination towards conventional family arrangements.
(Saadia <i>et al.</i> , 2024)	Al-Qassim, Saudi Arabia	This study aims to examine the knowledge, attitudes, and perspectives of women of reproductive age in Al-Qassim, Saudi Arabia, concerning fertility and elective oocyte cryopreservation .	cross-section study with online questioner	612 participants	The study indicated that although numerous participants were aware of social egg freezing, a considerable portion felt inadequately informed about the process. The results revealed a significant association between level of education and awareness of oocyte cryopreservation, with women possessing higher degrees exhibiting superior



					understanding and more favourable views towards the process. Although acknowledging the hazards linked to late maternal age and the possible advantages of fertility preservation, several individuals conveyed less apprehension regarding their own diminishing fertility.
(Platts et al., 2021)	London, UK	The aim of this review was to explore women's attitudes, knowledge, and intentions regarding the use of OFNMR among both users and the wider public.	systematic review	35 studies	OFNMR users typically had an adequate knowledge of the reduction in fertility associated with aging and the procedure for oocyte cryopreservation. However, public understanding was unclear, with numerous individuals underappreciating the influence of age on fertility. The biggest drive for women to engage in OFNMR was the absence of an appropriate spouse for procreation. The high cost was recognized as a major obstacle to utilizing OFNMR. The review emphasized that societal perceptions, media representations, and misconceptions regarding fertility and age-related decline substantially impact women's choices on OFNMR.
(Armstrong <i>et al.</i> , 2023)	University of Kansas School of Medicine - Wichita, United States	This study aims to evaluate medical students' knowledge and attitudes towards oocyte cryopreservation, along with their intentions to utilize this	cross-sectional	122 female	A significant proportion of female medical students would think about planned oocyte cryopreservation. A considerable number of women experienced pressure to delay childbirth

		method in the future.			and self-identified as prospective users of oocyte cryopreservation. While most students were aware of oocyte cryopreservation, their understanding of general fertility and the success rate of oocyte cryopreservation was limited. Factors impacting decision-making identified by all participants were the health of kids, possibility of success, desire for a child, and the preservation of fertility. The necessity of self-administering injections and uncertainty on the desire for children were less frequently mentioned as factors affecting decision-making.
(Kynigopoulou <i>et al.</i> , 2024)	Greece	This research aims to provide an overview of the societal factors that prompt women to think about egg cryopreservation, along with their attitudes and understanding of this procedure.	Literature Review	73 article	The phenomenon of "Egg Cryopreservation for Social Reasons" indicates that an increasing percentage of women are choosing to freeze their eggs mostly due to social considerations, including the absence of a suitable spouse, professional development, and financial instability. The review indicates that although some women are interested to the concept of social egg freezing, several individuals expressed fears regarding its success rates, health dangers, and ethical considerations. In addition, there exists an essential requirement for

					enhanced knowledge about fertility decline and the available alternatives for fertility preservation.
(Gambadauro <i>et al.</i> , 2023)	Sweden	The research intended to examine opinions toward oocyte cryopreservation (OC) in various contexts, particularly contrasting medical and age-related situations. It aimed to obtain insights into citizens' acceptability and openness towards OC, specifically about public funding and willingness to pay (WTP) for the procedure.	prospective survey designed	270 participants	The study revealed that a significant percentage of students accepted and would think about OC, despite the circumstances (medical or age-related). Public Funding Support: Support for public funding of OC was more pronounced in medical contexts than in age-related situations. The study assessed individuals' Willingness-to-Pay (WTP) for OC, focusing the economic factors associated with fertility preservation alternatives.
(Johnston <i>et al.</i> , 2020)	Australia	The objective of the study was to investigate public perceptions of both medical and non-medical egg freezing, evaluate the determinants shaping these perceptions, and comprehend the ramifications of egg freezing on family planning and reproductive decisions. The study aimed to provide evidence-based policy and guidelines for access to EF services.	cross-sectional	656 female participants	Advocacy for Medical Egg Freezing: More than 97% of respondents endorsed access to egg freezing for medical purposes. The degree of support for non-medical egg freezing exhibited considerable variation based on demographic characteristics. Participants under 40 exhibited greater support for non-medical egg freezing than their older counterparts. Women aged 30 to 39 exhibited significant support for egg freezing alternatives. The educational background affects behaviors, as individuals with post-

					<p>graduate degrees exhibited varying amounts of support for non-medical reasons in contrast to others. Parental Intentions: Participants' desires toward parenthood influenced their perspectives on oocyte cryopreservation. Financial Obstacles: The research revealed that cost constitutes an important obstacle to accessing egg freezing services, with participants indicating a preference for these services to be offered at reasonable costs.</p>
(Osaah <i>et al.</i> , 2024)	private university in Kumasi, Ghana	This study intended to assess female reproductive awareness, childbearing desires, and attitudes about elective egg freezing among female college students in Kumasi.	cross-sectional design	140 participants	<p>The respondents had a considerable gap in understanding age-related reproductive reduction. Erroneously assumed that the reduction in a woman's egg quantity and quality becomes most significant after the age of 40, highlighting a substantial deficiency in comprehension. The main sources of information regarding fertility awareness for the respondents were health professionals (33.33%), the Internet (30.37%), and television (14.81%). Knowledge about elective egg freezing was limited; nonetheless, over half (48.89%) of the participants expressed interest, mainly to preserve the possibility of having a biological child in the future. A majority of students</p>

					(74.81%) asserted that parenthood was essential to them and conveyed a readiness to pursue reproductive treatment should they encounter difficulties in conceiving. This differs from findings in other nations where students favored prioritizing professions above adoption.
(Zhou <i>et al.</i> , 2022)	Hefei, an eastern city in China, included five comprehensive universities	The main objective of the study was to investigate university students' knowledge, beliefs, and attitudes regarding elective egg freezing.	cross-sectional	750 participants	<p>About 50% of female participants indicated limited understanding of the benefits and risks associated with egg freezing.</p> <p>Approximately 36.9% of participants approved elective egg freezing.</p> <p>The main element affecting support for egg freezing was the students' field of study. Medical students generally exhibit a superior understanding of reproductive technologies, such as egg freezing, which is associated with increased acceptability.</p> <p>Postponed Childbearing: The prolonged academic schedule in medical education frequently results in the deferral of significant life events, including marriage and childbearing, leading medical students to contemplate oocyte cryopreservation as a feasible alternative.</p> <p>Approximately 60% contended that marital status ought not to be a criterion for egg freezing.</p>
(Kasaven <i>et al.</i> , 2023)	UK	The main objective of the	cross-sectional	5482 women.	Research reveals that awareness of oocyte



		research is to enhance knowledge and understanding of oocyte cryopreservation (OC) as an option for minimizing age-related reproductive decline (ARFD). The survey aims to examine the knowledge, attitudes, and perspectives of women aged 18–50 years in the UK about fertility preservation choices, with a particular emphasis on OC.			<p>cryopreservation (OC) as a strategy to address age-related reproductive decline (ARFD) has increased, however substantial knowledge gaps persist. The cost load is identified as a major obstacle to seeking OC for ARFD. Optimal Timing for OC: There is no agreement on the ideal age for undergoing OC. Although numerous women perceive the optimal age as between 20 and 29, research indicates that ovarian cryopreservation is frequently sought too late, diminishing the likelihood of healthy live deliveries.</p> <p>Rationale for Evaluating OC: The predominant causes for contemplating OC are the absence of a partner (63%), the pursuit of financial stability (69.4%), and a concentration on profession (51.4%).</p>
(Sayegh <i>et al.</i> , 2023)	United Arab Emirates	The objective of this research is to evaluate the knowledge and attitudes of reproductive-aged women regarding planned oocyte cryopreservation (POC) in the United Arab Emirates (UAE).	cross-sectional	422 women	<p>Inadequate Knowledge: Although awareness of oocyte cryopreservation was high at 91.2%, the overall knowledge score among participants was poor, averaging 44.44%. A significant majority of women were uninformed about essential elements of the treatment, including the quantity of hormone injections necessary and the viability rate</p>

					<p>of cryopreserved oocytes. The research indicated that educational background was a crucial factor influencing understanding about POC. Women possessing advanced educational qualifications, especially in the medical domain, had superior knowledge scores relative to individuals with lesser educational attainment. The expense of the oocyte cryopreservation method became a significant obstacle for several participants. A considerable number of women indicated that they would contemplate POC if expenses were subsidized by public financing or health insurance. Motivation for POC: The main reasons for contemplating POC were the absence of an appropriate spouse (42.6%) and professional progression (25.7%). This underscores the emotional and practical considerations affecting women's choices about fertility preservation.</p>
(Nunes <i>et al.</i> , 2024)	Portugal.	The objective of the study was to explain general fertility knowledge, determinants influencing fertility, awareness of fertility preservation, attitudes towards	quantitative research	257 Portuguese women	<p>The findings reveal a substantial deficiency in understanding about fertility among participants. Specifically, 51.4% wrongly identified the optimal age range for female fertility, while 65.4% misidentified the age at which fertility</p>

		<p>fertility preservation, and the inclination to seek additional information on these subjects among reproductive-age Portuguese women.</p>			<p>markedly drops. Nonetheless, a majority acknowledged that lifestyle variables, like smoking and obesity, in conjunction with age, influence fertility. Concerning fertility preservation, 80.1% of participants recognized oocyte cryopreservation, whereas 68.9% indicated a lack of interest in this option. The principal reasons for this disinterest were a failure to contemplate these approaches, a refusal to conceive, and apprehensions around aging. A significant demand for additional information was seen, with 82.1% of participants desiring healthcare practitioners to address fertility preservation alternatives during consultations. This indicates an acknowledged necessity for enhanced education regarding fertility and preservation techniques. Perspectives on Fertility Preservation Younger individuals shown a higher tendency for asking questions about fertility preservation. Rationale for Considering Preservation: 56.3% would think about it to avert age-related deterioration in oocyte quality, whilst 26.3% would do it due to the absence of a partner. Financial</p>
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					<p>Concerns: The financial consequences were a primary concern for 32.5% of individuals about fertility preservation.</p> <p>Awareness of Techniques: Knowledge regarding numerous fertility preservation approaches was restricted, with merely 34.2% cognizant of multiple techniques.</p> <p>Education on Fertility: A substantial majority concurred that fertility-related education had to be incorporated into school curricula and medical consultations.</p>
(Tandoğan <i>et al.</i> , 2023 )	Istanbul, Turkey	The objective of this study was to assess the perspectives of female academicians on oocyte cryopreservation .	qualitative study	12 unmarried academic women	Participants generally expressed favorable views of the benefits of oocyte cryopreservation; yet, they expressed concerns about pregnancies resulting from frozen oocytes.
(Arendt & Oxlad, 2023)	Australian	The major objective of this study was to examine Australian women's perspectives on non-medical egg freezing and to ascertain the factors influencing their decisions to freeze eggs.	cross-sectional	514 Australian women	The results indicate a moderate to high level of acceptance of non-medical egg freezing among Australian women, while simultaneously emphasizing that cost constitutes a barrier influencing women's decisions.
(Sandhu <i>et al.</i> , 2023)	Australia	The main goal of the paper is to ascertain the information and decision support requirements of women seeking information regarding	cross-sectional survey	332 women	<p>Knowledge Deficiencies: Women interested in POC demonstrated considerable deficiencies in their understanding of the potential health concerns and success</p>

		planned oocyte cryopreservation			rates related to the procedure. A significant number of women experienced uncertainty concerning their decisions related to POC. Participants indicated a preference for obtaining POC information by the age of 30, particularly from healthcare providers and digital sites.
(Ghazeeri <i>et al.</i> , 2023)	Lebanon	The main aim of this study is to evaluate Lebanese women's awareness and acceptance of oocyte cryopreservation, commonly referred to as egg freezing.	cross-sectional survey	402 women	<p>Considerable awareness among Lebanese women about this fertility-preserving findings indicated that medical egg freezing garnered greater acceptance than social egg freezing. The primary justification for social egg freezing is to assist women who encounter difficulties in locating an appropriate spouse during their optimal reproductive years. The predominant issue among women considering egg freezing was the insufficient knowledge pertaining to the technique. Additional notable issues encompassed the procedure's safety for prospective offspring and its effects on future fertility. Women aged 18-30 were determined to be 2.09 times more inclined toward thinking about egg freezing than those aged 31-39. Furthermore, unmarried women were 4.31 times more like to consider it than their peers in</p>



					relationships, while childless women were 5.00 times more likely in comparison to those with children. The study indicated that, despite the traditional and conservative characteristics of Lebanese society, awareness and acceptance of egg freezing were greater than anticipated, implying a possible change in attitudes towards fertility preservation in the region.
(Akhondi <i>et al.</i> ,2023 )	Iran	The primary objective of this study is to assess the knowledge and beliefs regarding oocyte cryopreservation (OC) for medical and social purposes among female students in Iran.	cross-sectional study	1,279 women	Female students in Tehran universities demonstrate a positive disposition towards oocyte cryopreservation although possess insufficient understanding of its effects, expenses, and optimal time. Cost was a crucial element influencing the student's selection. A strong agreement (95.5%) said that healthcare providers ought to frequently furnish information regarding egg freezing to women of reproductive age during medical consultations.
(Sewidan & Abd Elhamid, 2023)	Egypt	The study primarily seeks to evaluate the understanding and perceptions of egg freezing among female students.	Cross-Sectional Study	1279 student	The study indicated a significant awareness and mostly favorable attitude towards oocyte cryopreservation among female medical students. Cost was a crucial element in the decision-making process. Participants concurred that healthcare personnel needed to frequently

					apprise women of reproductive age regarding egg freezing throughout standard health consultations.
(Güngör Satılmış <i>et al.</i> , 2022)	Istanbul, Turkey	The main goal of this research is to examine the knowledge and attitudes of Turkish midwifery and nursing students regarding oocyte cryopreservation .	cross-sectional research	342 participants	The study underlines an increasing interest in oocyte cryopreservation among healthcare students, mostly motivated by job aspirations and a desire for reproductive autonomy. Cultural and ethical factors profoundly impact attitudes toward the practice. Students articulated many motivations for contemplating social egg freezing, with prevalent causes encompassing job prioritization, the intention to postpone delivery due to the absence of suitable partners, and personal readiness.
(Kostenzer <i>et al.</i> , 2021 )	Netherlands	The main goal of the research is to systematically examine and identify the various perspectives about egg freezing among women of reproductive age.	Q-methodology	34 women	Prudent Regarding Oocyte Cryopreservation Technology: This viewpoint highlights a cautious and ethical stance on oocyte cryopreservation. My Body, My Autonomy: This perspective is grounded in liberal feminist principles, promoting women's independence. Egg freezing is perceived as unnatural by some respondents, who voice apprehensions over the technology's artificiality and its impact on conventional perspectives of motherhood and reproduction.

(Hathaway, 2021)	New Zealand	This paper aims to critically review and analyze studies on women's motivations and experiences regarding assisted reproductive technologies, particularly elective oocyte cryopreservation, and its implications within societal norms and reproductive choices.	Systematic review	20 articles	<p>Principal Motivations for SEF</p> <p>Absence of an Appropriate Partner: More than 80% of women identified the lack of a dedicated spouse as a significant reason for selecting SEF.</p> <p>Age-Related Fertility Concerns: Numerous women experience a heightened sense of urgency owing to diminishing fertility with advancing age. The aspiration for a contingency strategy: SEF is perceived as a method to ensure future reproductive alternatives.</p> <p>Empowerment: Numerous women express a sense of empowerment derived from exercising control over their reproductive decisions.</p> <p>Social Pressure: Cultural norms regarding family and parenting can impact decisions related to egg freezing.</p> <p>Career Advancement: While not the prevailing viewpoint, several women regard SEF as a means to prioritize their careers prior to commencing a family.</p> <p>Financial Stability: The aspiration to attain financial security prior to procreation serves as an additional motive.</p> <p>Personal Health: Worries over individual health and fertility may prompt women to contemplate SEF.</p>
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(G. Fahmy & H. Mohamed, 2021)	Egypt	to evaluate the knowledge, attitudes, and obstacles faced by unmarried female nursing students in a bridging program about egg freezing (EF)	Descriptive Research Design	60 participants	<p>knowledge Level: Approximately 60% of nursing students possessed insufficient understanding regarding egg freezing. This signifies a substantial deficiency in comprehension of this reproductive technology among the participants.</p> <p>Attitude Towards Egg Freezing: Despite the existing knowledge deficit, 61.7% of participants demonstrated a favorable attitude towards egg freezing. This indicates that, despite having inadequate understanding, numerous students are receptive to the idea of egg freezing as a reproductive alternative.</p> <p>Obstacles to Oocyte Cryopreservation: The research highlighted multiple obstacles encountered by participants about egg freezing. Approximately 75% of the students identified the apprehension regarding their future husband's potential refusal as a substantial obstacle to engaging in egg freezing.</p> <p>Approximately 73.3% of interviewees identified cultural views as a significant obstacle influencing their choice to contemplate egg freezing.</p>
(Nasab <i>et al.</i> , 2020)	USA	seeks to investigate women's	qualifies as a systematic review	22 original studies	Favorable Justifications for Elective Oocyte

		viewpoints and motivations concerning elective oocyte cryopreservation .			<p>Cryopreservation: Prevalent motivations for opting to preserve oocytes encompassed: Wishing for further time to identify an appropriate spouse. Economic stability and professional progression. Apprehension regarding future fertility Thirty-six. Many women articulated that the capacity to postpone parenting enables them to attain personal and professional accomplishments prior to having children.</p> <p>Negative Rationales: Concerns over the physical discomfort and possible consequences related to the egg freezing procedure were observed. Certain women used their youth and present relationship status as justifications for deferring egg freezing.</p> <p>Cultural and Geographical Variations: Support for elective egg freezing is significantly greater among women in Western nations than in non-Western areas. Factors affecting attitudes comprised cultural ideas, individual experiences, and knowledge about reproductive technologies.</p> <p>Overall Sentiments: Women in multiple trials demonstrated considerable</p>
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					<p>endorsement for elective egg freezing, perceiving it as a feasible method for safeguarding fertility while achieving life objectives.</p> <p>The prevailing mood toward the surgery is predominantly favorable, as numerous women feel empowered by the decision to postpone parenting.</p>
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## 2.8 CHAPTER SUMMARY

This section outlines the methodologies used in gathering information for the literature review. These methodologies encompassed the databases used for the investigations under discussion. This section defines the technique utilized to evaluate the chosen papers. A synthesis of the literature is provided, and the research need is defined.

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