

ARTICLE

Motherhood, Fairness, and Flourishing: Widening Reproductive Choices in Saudi Arabia

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Abstract

In a landmark *Fatwa*, Saudi Arabia's highest religious authority—the Council of Senior Scholars—declared the Islamic permissibility of oocyte cryopreservation. The fatwa sanctioned the retrieval, preservation, and future use of oocytes, ovarian tissue, and whole ovaries from cancer patients receiving gonadotoxic interventions. Although momentous, the fatwa's specification of cancer patients effectively rendered this technology unavailable to others to whom it may be similarly beneficial, including patients with other medical conditions or patients seeking elective cryopreservation. This article argues in favor of widening reproductive choices through expanded access to oocyte cryopreservation in Saudi Arabia—regardless of the underlying cause of infertility—on three grounds: the technology's compliance with Islamic law, as a matter of fairness in medical practice, and as a means to support the well-being and flourishing of Saudi women within the context of a national societal and economic transformation strategy closely linked to their success.

Keywords: infertility; cryopreservation; Islamic law; Saudi Arabia; reproductive choices; fairness in medical practice; Saudi women

Introduction

In 2019, a landmark *Fatwa*, or religious decree, issued by Saudi Arabia's highest religious authority—the Council of Senior Scholars—declared the permissibility of oocyte and ovarian tissue cryopreservation under Islamic law.¹ The fatwa sanctioned the retrieval, preservation, and future use of oocytes, ovarian tissue, and whole ovaries from cancer patients whose therapeutic courses require the administration of gonadotoxic agents that may result in infertility. This was a revolutionary decision; not only did it advance assisted reproductive technology (ART) in the country, but it also gave hope to a group of patients undergoing essential, albeit infertility-inducing, therapeutic interventions.

The fatwa's specification of cancer patients, however, effectively rendered this technology unavailable to others to whom it may be similarly beneficial, including patients receiving gonadotoxic medications for other diseases, patients with infertility resulting from congenital conditions, or indeed those without ailments but who desire cryopreservation for so-called “social” reasons, that is, elective cryopreservation to protect against the natural, age-related decline of fertility.²

This article argues in favor of widening reproductive choices in Saudi Arabia through expanded access to oocyte cryopreservation—regardless of the underlying cause of infertility—on three grounds. First, there is no indication of an inherent conflict between oocyte cryopreservation and Islamic law. In fact, since the fatwa does not explicitly prohibit other patients from benefiting from cryopreservation, widened permissibility is amenable to further exploration. Second, as a matter of fairness, harm caused by fertility loss in cancer patients should not be deemed morally distinct from the harm caused by fertility loss due to other conditions, including age-related fertility decline. Third, expanded access enhances the well-being and flourishing of Saudi women by enabling them to make informed decisions about when to have children and with whom, without compromising education and career opportunities. This is

particularly salient in the context of Saudi Arabia's ambitious transformative development strategy, Vision 2030, which emphasizes women's participation in the workforce as a central requirement of a thriving economy and a sustainable future.³

The article begins with an account of oocyte cryopreservation and some of the ethical concerns raised by this technology, including challenges to elective cryopreservation. Next, cryopreservation is examined through the lens of Islamic law. Finding no conflict, agreements are presented in support of expanded access, including those based on fairness and flourishing, and recommendations are given for a cryopreservation practice that not only widens reproductive choices, but is also adherent to Islamic values and attentive of Saudi Arabian cultural norms.⁴

Background

Advances in ART have given hope to many individuals unable to conceive naturally. Cryopreservation—the retrieval, freezing, and storage of gametes and zygotes for future fertilization or implantation—has increased reproductive options for women in particular.⁵ The technology was first developed with the successful freezing and thawing of human sperm almost 70 years ago.⁶ The cryopreservation of oocytes, however, proved more complex, largely due to their relative scarcity and declining quality, and their susceptibility to intracellular ice formation.^{7,8} Nevertheless, the first successful pregnancy from a cryopreserved oocyte took place in 1986 resulting in a twin birth.^{9,10}

Oocyte cryopreservation occurs in multiple steps, beginning with the stimulation of ovulation and the induction of maturity through the administration of exogenous gonadotropins.¹¹ Mature oocytes are then retrieved through transvaginal ultrasound (US) guidance after which they undergo freezing and storage.¹² Early protocols favored a controlled slow freezing technique¹³; however, this led to the crystallization and meiotic disruption of the retrieved oocytes, jeopardizing their quality.¹⁴ It was not until the development of vitrification, an ultra-rapid cooling technique preventing ice formation, that oocyte cryopreservation became a popular and reliable option.^{15,16}

In 2012, partly in response to these advancements, multiple medical organizations, including the American Society for Reproductive Medicine (ASRM) and the European Society for Human Reproduction and Embryology (ESHRE) lifted the “experimental” label from oocyte cryopreservation, enabling more women to benefit from the technology.^{17,18} Although oocyte cryopreservation has become well-established—particularly, when it is deemed medically indicated—it also remains a subject of considerable ethical debate.

Ethical Concerns

As the availability of oocyte cryopreservation increased, wary skeptics challenged its alleged efficacy. There does appear to be variability in success rates; larger and more experienced ART programs show more favorable outcomes, as do procedures performed on younger and healthier women.¹⁹ This reported variability precludes generalizable conclusions regarding the overall efficacy of oocyte cryopreservation. However, advocates remain resolute that variable outcomes should be seen as an impetus for more research and better oversight, rather than a premature reason to limit this technology.²⁰

Additionally, critics have raised concerns in regard to the safety of oocyte cryopreservation. Some studies suggest that cryopreservation may increase the risk of ovarian hyperstimulation, bleeding, organ damage, complications from anesthesia and sedation, ectopic pregnancy, preeclampsia, cardiac disease, and gestational diabetes.²¹ Additional research, however, indicates that these risks are minimal, rarely fatal, and comparable to those associated with in vitro fertilization (IVF), an increasingly common and widely available ART.²² Proponents have argued that safety concerns should not prevent women from making informed decisions regarding cryopreservation, in the same manner that they do not for IVF and other ARTs.²³

Although opponents raise worthy concerns regarding oocyte cryopreservation, evidence does not appear to strongly support these claims. Indeed, the ASRM's decision to formally recognize the procedure

as an effective and safe technology, after careful and extensive review of available research,²⁴ lends ample support to oocyte cryopreservation, and enables further exploration of its various indications, including procedures performed electively.

Elective Cryopreservation

A growing number of healthy women are turning to elective cryopreservation—performed with the aim of extending fertility in the absence of an underlying medical condition or gonadotoxic intervention—to preserve their fertility against age-related decline.²⁵ By age 35, the decreased quantity and quality of oocytes negatively impact successful fertilization and fetal development.²⁶ As educational and career opportunities, or the lack of a partner, force some women to delay childbearing until their 30s or 40s, elective cryopreservation has become an appealing option for those wanting to ensure their ability to conceive is preserved.²⁷

Some opponents of elective cryopreservation are critical of the way it is sometimes framed as a guaranteed safeguard against age-related infertility.²⁸ They contend that this misconception undermines the ability of women to make informed decisions.²⁹ Given the variability in success rates, critics argue that women should be advised to have children early, rather than be encouraged to make a misinformed, pricy, and unguaranteed investment.³⁰ Similarly, the ASRM's endorsement of oocyte cryopreservation falls short of procedures performed electively, and instead warns against giving healthy women “false hope” through this technology.³¹

Some skeptics additionally worry that expanded access to elective cryopreservation will result in women delaying motherhood until their 50s or 60s increasing both maternal burden and fetal risk.³² They also raise concerns about older women's suitability to the challenges of motherhood, arguing that children deserve young, healthy mothers who are able to keep up with them.³³

In light of these purported risks, opponents contend that oocyte cryopreservation may only be ethically justified in the context of a medical indication. In their view, cryopreservation performed electively for so-called social reasons does not warrant similar moral justification.

Supporters of expanded access, however, find the distinction between medical and social indications problematic.³⁴ They challenge the assertion that social reasons transform the procedure into a non-medical intervention. Cryopreservation is performed with the aim of safeguarding and extending fertility, the underlying threat—be it cancer, autoimmune disease, or age-related decline—does not alter its medical and preventive objectives, and should therefore be considered morally irrelevant.³⁵ Some advocates further find the mere social designation to be implicitly judgmental and argue its continued use invalidates the needs of women by reducing them to a wish or preference.^{36,37}

Proponents of elective cryopreservation are equally unconvinced by concerns that women might make uninformed decisions regarding this technology.³⁸ They find no evidence to suggest that women are unable to make good decisions when it comes to oocyte cryopreservation, and argue that it is overly paternalistic to restrict access instead of giving good counsel to women.³⁹ They contend that women should be better supported to make informed decisions regarding elective cryopreservation, with a clear understanding of the risks, costs, and variability in outcomes.⁴⁰

Advocates have also rejected the claims that women in their 50s and 60s are unfit for motherhood as a troubling double standard, and argued that men frequently continue to have children until their late 80s without limitation or criticism.⁴¹ Indeed, research finds no evidence that children of working and older mothers are disadvantaged. In fact, these children were found to be healthier, more educated, and experience fewer behavioral, social, and emotional difficulties.^{42,43}

Supporters further hail the value of elective cryopreservation in remedying an obvious gender inequality.⁴⁴ Women frequently have to choose between having children or pursuing education and work opportunities, potentially impacting their career choice and future earnings, or their ability to have children.⁴⁵⁻⁴⁶ The availability of elective cryopreservation enables women to make these difficult choices without guilt or compromise. It also eliminates societal and personal pressures to find a partner without settling for incompatible or marriages.⁴⁷

For Saudi women, the availability of oocyte cryopreservation—elective or otherwise—raises new dilemmas regarding the Islamic permissibility of this newfound technology. It is salient to consider the Islamic values that may affect rulings on cryopreservation, and how those decisions may inform the ethical debate in Saudi Arabia.

Islam, Saudi Arabia, and Oocyte Cryopreservation

The last of the Abrahamic religions, Islam is the world's second-largest religion and fastest growing, resulting in a Muslim community diverse in culture, ethnicity, and of course, religiosity.⁴⁸ This rich diversity contributes to robust and unique understandings of Islamic teachings. Several denominations exist within Islam—each with its own particular interpretive methodology—the largest of which is the Sunni school. This essay will limit its examination of oocyte cryopreservation to the Sunni position as it constitutes the predominant and official school in Saudi Arabia.

Matters of law, morality, community, and personal responsibility are addressed through the Islamic legal system known as *Sharia*. Comprised of the teachings of the *Quran* and the *Sunnah*—Prophetic tradition—*Sharia* is understood by Muslims to be a product of divine intervention and represents the undisputed basis of moral inquiry.^{49,50} For matters not addressed directly by *Sharia*, such as newfound ART, for example, Muslim scholars contemplate sacred texts in an effort to translate *Sharia*'s basic moral tenets into legislation.⁵¹ These scholars are sometimes formally recognized as *Muftis* and are tasked with serving on Islamic Councils, such as The Council of Senior Scholars in Saudi Arabia, and advising governments or Muslim populations through the issuance of fatwas on all matters of moral or legal uncertainty.

Acknowledging the emotional and psychological impact of infertility, and in accordance with Islam's preference for pronatalism, the use of ART has been strongly encouraged by Muslim scholars.⁵² However, *Muftis*' endorsement of ART is strongly dependent upon an individual's marital status, with the majority prohibiting ART use by unmarried persons.^{53,54} The sanctioning of oocyte cryopreservation for unmarried cancer patients requiring gonadotoxic therapy is a rare exception.⁵⁵

In 2019, the Egyptian Dar Al-Ifta—an influential Sunni Muslim council—expanded the permissibility of oocyte cryopreservation to include healthy unmarried women under certain conditions: the safe and secure handling of retrieved oocytes, strict limitation of access to cryopreserved material, the prohibition of donation of cryopreserved oocytes, and the restriction of fertilization to the genetic material of the woman's future husband.⁵⁶

The findings of the Egyptian Council have important implications for Sunni Muslims elsewhere. This decision furthers Islam's interest in pronatalism, promotes the emotional well-being of Muslims, and supports scientific technology without compromising the limitation of reproduction to married couples, a central concept of Islamic family law. It also raises moral questions worthy of contemplation by other Islamic councils, including those in Saudi Arabia.

The Fatwa of the Saudi Senior Council of Scholars

As a modern-day theocracy, religion plays an important role in Saudi Arabia's professional and legal regulations and social norms. The Council of Senior Scholars, an integral branch of government, is responsible for ensuring that law and policy correspond with the teachings of *Sharia* through the issuance of fatwas.⁵⁷

In 2019, seeking religious clarity on a morally complex issue affecting their patients, a group of Saudi oncologists and fertility specialists posed a specific question to the Council: In regard to cancer patients requiring gonadotoxic therapies, was the cryopreservation of oocytes, whole ovaries, and ovarian tissue permissible under Islamic law?⁵⁸

The Council's response was positive, permitting cryopreservation in this group of patients only if no other therapeutic alternative exists. In this landmark fatwa, the Council suggested several safeguards to ensure the process aligns with Islamic law.^{59,60} First, future implantation must be limited to the same

patient from which the oocyte, ovary, or tissue was retrieved. Second, the donation of oocytes or ovarian tissue is strictly prohibited. Third, protections must be taken to ensure adequate informed consent of patients, and the safe extraction and preservation of the oocyte or ovarian material. Fourth, all cryopreserved material must be kept under restricted access in authorized facilities. Fifth, specialized oversight committees must be established to regulate the practice.⁶¹ The Law of Fertilization, Utero-Fetal and Infertility Treatment Units—issued by the Ministry of Health and confirmed by Royal decree—further instructs all infertility treatment centers to abide by the fatwas of the Council,⁶² cementing the authority, and significance, of the fatwa on oocyte cryopreservation.

The Council justifies its ruling as necessary to fulfill one of Sharia's five main moral obligations: the preservation of *nasil*, that is, lineage.^{63,64} Although the Council recognizes certain risks associated with cryopreservation, it concludes that these risks are outweighed by the benefits of cryopreservation and its value in furthering Sharia's interest in preserving lineage and reproduction.

The Council's fatwa is, without doubt, momentous; resulting in breakthrough progress for cancer patients. The limitation to this group can be understood to be a direct consequence of the targeted question put forth to the Council. Still, the Council's approval of cryopreservation for cancer patients raises the possibility of expanding permissibility to include other women likely to benefit. Before examining arguments in support of further expansion, it is instructive to first explore the concerns of Muslim scholars, and consider any potential conflict between oocyte cryopreservation and Islamic family law.

Islamic Challenges to Oocyte Cryopreservation

Despite widespread support for infertility treatment, Muslim scholars are still hesitant to permit oocyte cryopreservation beyond cancer patients. These reservations are concerned with the prevention of harm associated with the retrieval, preservation, and future use of oocytes.

The Preservation of Known Lineage

The main contention against widened permissibility reflects fundamental understandings of Islamic family law which hold that reproduction must be limited to within the bounds of marriage, a position repeatedly and firmly upheld by Muslim scholars.^{65,66,67} This limitation has been historically purposeful; addressing a number of societal issues at the time of Islam's revelation in the seventh century including false accusations of adultery against women.⁶⁸ The restriction to married couples reaffirms Sharia's moral commitment to the preservation of lineage, the significance of which stems from the norms of the tribal society into which Islam was first revealed, and where an individual's family determined their place in the community. Its preservation is believed to have been instructed to ensure that children were recognized by their fathers and were not deprived of their birthrights.⁶⁹ Today, lineage preservation remains an integral part of Islamic family law⁷⁰; Muslim children must always carry the surnames of their biological fathers, regardless of the conditions of their births or subsequent adoption.⁷¹

These clearly articulated teachings regarding reproduction may certainly inspire, in the observant Muslim, an understandable and warranted ambivalence toward novel developments in ART, including cryopreservation. Yet, it is not evident that oocyte cryopreservation is inherently in conflict with these dictates. Restricted to the retrieval and freezing of oocytes, this technology does not involve the fertilization of ova, the use of donated material, or the creation of embryos. Therefore, no reproduction can be said to have occurred outside marriage in an unmarried woman, nor is there any mixing of lineage. Strict guidelines for the process of cryopreservation—already in place for cancer patients—ensure that the process is well-maintained and that safety precautions, including well-marked and identified material and restricted access, are followed. Lastly, there are no reports suggestive of laboratory mix-ups being a common occurrence, and thus these fears appear rather exaggerated and unjustified.

Still, future fertilization or implantation of cryopreserved oocytes does necessitate additional regulation to ensure adherence to Islamic requirements. As in the case in Egypt, further stipulation may be required to prohibit the donation of gametes, and restrict oocyte fertilization to the sperm of a spouse within a valid marriage contract ensuring only the husband and wife are genetically involved in reproduction, thus securing a known lineage for the child.

Beyond the reservations surrounding marriage and potential reproduction, the process in which the oocytes may be retrieved represents an additional concern among some conservative Muslims. In particular, the use of invasive technology for retrieval poses a dilemma for those who consider an intact hymen an indicator of virginity.

The Threat to “Virginity”

As aforementioned, the most common method of oocyte retrieval involves a transvaginal approach, including transvaginal US guidance. In women and girls who have not been previously sexually active, this may compromise the structural wholeness of the hymen—a tissue with no known biological function surrounding the vaginal opening.⁷² The “intact” status of the hymen has been traditionally viewed as the physical marker of virginity, and its absence is commonly attributed to vaginal intercourse.⁷³

Islam prohibits sex outside marriage for both men and women.⁷⁴ Accordingly, Muslim societies do not condone premarital or extramarital sexual relationships, and some Muslim communities regulate sexuality heavily.⁷⁵ Indeed, Islamic law considers sex outside a legal marriage contract a crime with some Muslim countries enforcing strict punishments.⁷⁶ Unsurprisingly, engaging in forbidden sexual contact has significant consequences for an individual’s public image, socioeconomic status, and perhaps even safety or freedom.^{77,78}

The concern with physical virginity is inseparable from the debate on oocyte cryopreservation. In a study in Lebanon in 2019, a country with a significant Muslim population, researchers reported that religiously observant parents of pediatric cancer patients worried that oocyte retrieval might jeopardize their daughters’ hymens.⁷⁹ Another article looking at cryopreservation in Egypt found similar concerns regarding hymen loss, and posited that undergoing any gynecological procedure may greatly affect a woman’s chances of marriage in some communities.⁸⁰ In Saudi Arabia, similarly, culturally pervasive concerns sometimes impact access to and delivery of care, with some practitioners and researchers wary of performing pelvic exams due to their cultural sensitivity and potential social and legal implications.^{81,82,83}

The significance granted to the hymen as a hallmark not only of sexual activity but also of virtue is certainly misplaced. Its intactness may be disrupted by causes other than sexual intercourse including penetrating pelvic injuries, the insertion of objects, or medical procedures.⁸⁴ In fact, studies report that the examination of the hymen has not been found to be a reliable test of sexual activity, and the supposed first-time bleeding is not routinely observed in most women.⁸⁵

Despite these realities, it appears that the presence of an intact hymen has become a critical measure of chastity in many Muslim cultures. Its loss—whether the result of vaginal intercourse, sporting activity, use of female sanitary products, or indeed the transvaginal retrieval of oocytes for cryopreservation—threatens abstract notions of virginity and virtue. The limitation of oocyte cryopreservation based on virginity concerns inadvertently validates these unfounded claims and risks harming women by upholding social constructs of modesty and worth. Further, the consideration of the hymen’s structural wholeness as a barrier to widened permissibility unjustly affects women’s access to beneficial medical technology, and a chance at much-desired motherhood.

Most saliently perhaps, Islamic law places no importance on the hymen’s integrity providing additional, religious-based, evidence of its questionable value.⁸⁶ Accordingly, Muslim scholars have a moral obligation to change misconceptions about virginity in their communities, instead of furthering a prohibition against oocyte cryopreservation rooted in concerns around the hymen. Until then, alternative approaches to oocyte retrieval can be utilized to allow unmarried women concerned with preserving the integrity of their hymen to benefit from this technology, including utilizing a laparoscopic, trans-

abdominal approach.⁸⁷ These alternatives and protections are already in place for unmarried cancer patients undergoing cryopreservation and should be extended to noncancer patients as well.

Indeed, the heavy burden of fertility loss is not unique to cancer; the underlying condition resulting in infertility should not be deemed morally or religiously relevant to the permissibility of oocyte cryopreservation. Next, expanded access to this technology is examined as a matter of fairness.

Fairness

As discussed in the previous section, and as is made evident by the Saudi Council's fatwa, there appears to be no inherent conflict between cryopreservation technology and Islamic dictates. Although significant, the Council's limited sanctioning of oocyte cryopreservation effectively rendered the technology unavailable to other women likely to benefit.

The original question presented to the Council was restricted to a particular group: unmarried cancer patients receiving gonadotoxic interventions. The resulting fatwa, therefore, was similarly restricted and did not speak to other medical or social conditions. This is not unusual; under Islamic law, fatwas must be confined to the parameters of the question in order to avoid further confusion.⁸⁸

In its current form, the Council's fatwa does not address cryopreservation in nonmalignancy conditions—effectively excluding women requiring gonadotoxic interventions for autoimmune diseases and myelodysplastic syndromes, women with infertility-inducing conditions such as premature ovarian failure, and women who choose cryopreservation to protect against age-related fertility decline.⁸⁹ However, since the fatwa does not explicitly prohibit other patients from benefiting from cryopreservation, the matter is amenable to further exploration.

In permitting cryopreservation in this group of patients, the Council recognized the harm caused through the loss of fertility, and aimed to alleviate this harm and fulfill Sharia's moral obligation to the preservation of lineage.⁹⁰ The Islamic principle of *necessity*—which permits matters that may otherwise be prohibited in order to prevent serious harm⁹¹—further justified the Council's decision by permitting this technology outside the traditional marriage requirement and in spite of some concerns regarding known lineage.

Expanding access beyond cancer patients widens reproductive choices and aligns with these stated justifications. The harm caused by the loss of fertility is comparable across all conditions, particularly, when fertility loss is caused by similarly gonadotoxic therapies. There is no moral distinction between the harm caused by loss of fertility due to cancer and the harm caused by loss of fertility due to other causes.⁹² Consequently, the underlying condition leading to the loss of fertility should not be morally relevant to the permissibility of cryopreservation.

Further, the distinction between cancer patients and others facing similar fertility loss appears in conflict with the bioethical principle of justice. As articulated by philosophers Tom Beauchamp and James Childress in their formative text *Principles of Biomedical Ethics*, the principle of justice creates a moral duty to eliminate healthcare disparity.⁹³ The principle emphasizes fairness, particularly in the distribution, and access to, potential health benefits. Fairness commands that similarly situated patients must be treated fairly and must not be discriminated against due to their circumstances.

The limitation of cryopreservation is incompatible with the moral obligations delineated by the principle of justice. Patients whose fertility has been negatively impacted through other conditions, or indeed, through therapy aimed at treating those diseases should be similarly enabled to access potentially beneficial fertility-preserving technology. As such, the Saudi medical community has an ethical responsibility to ensure oocyte cryopreservation technology is available to all patients in whom it may prove effective, including women who seek elective cryopreservation. This begins with an expanded fatwa that recognizes the harm done to these patients, and permits them to utilize cryopreservation.

The sanctioning of oocyte cryopreservation for cancer patients in Saudi Arabia inevitably paves the way for widened permissibility to others who may also benefit. The cause of fertility loss should not be deemed morally relevant to the permissibility of cryopreservation, nor is it just to limit access based on

this cause. In this midst of Saudi Arabia's ambitious national transformation initiative, where women play a central role, increasing reproductive choices through an expanded permissibility of oocyte cryopreservation is even more warranted.

Flourishing

In 2016, Saudi Arabia announced Vision 2030—a progressive national development strategy aimed at diversifying the country's economy, improving quality of life, and cementing its position as an influential global force.⁹⁴ Increasing women's roles as active members of society is fundamental to this effort at a sustainable future, thriving economy, and vibrant community.⁹⁵ In particular, goals geared toward the empowerment of women, such as the relaxing of restrictions on mobility and travel, increased employment opportunities, and widened societal and governmental representation, were deemed integral to the success of this endeavor.

Since the launch of this transformative plan, women's participation in the Saudi workforce has doubled.⁹⁶ Legislative and policy measures such as protections against workplace harassment and discrimination, access to childcare, and supported maternity leave were instrumental in increasing women's employment.⁹⁷ At 20%, although rising, the number of Saudi women working outside the home is still well below the projected increase.⁹⁸

Expanded permissibility of oocyte cryopreservation supports the Vision's goals by increasing women's reproductive choices, and keeping them from having to compromise their education and career opportunities, or indeed their ability to have children. Recent research suggests that Saudi women face significant challenges regarding employment and motherhood.⁹⁹ In a 2017 study, 61% of participants believed the absence of family commitments to be beneficial to their work, while 39% felt that maternity leaves or similar career breaks negatively impacted their future employment.¹⁰⁰ Unsurprisingly, additional research indicates that a number of Saudi women prefer to postpone marriage and motherhood until their careers are well established.¹⁰¹⁻¹⁰² Indeed, recent data from the General Authority for Statistics find that 56% of women under 34 are not married.¹⁰³ Similarly, higher levels of education and increased employment have been linked to lower fertility and fewer children in Saudi women.¹⁰⁴ Further research finds increasing rates of infertility among Saudi women, overwhelmingly prevalent in women over 30.^{105,106}

In the context of Saudi Arabia's historically patriarchal society, Saudi women's worth was inextricably linked to their ability to produce children. Although fading, this interconnectedness is still rampant in some sections of society. Women whose marriages and motherhood are delayed may well experience shame and isolation, feelings that may be heightened by a conflicting desire to pursue thriving careers. As Saudi Arabia moves ahead with its progressive initiative, the societal pressure for women to excel and succeed, as well as marry and become mothers, will likely intensify, resulting in even more women having to make difficult life choices. Cryopreservation increases women's reproductive options by enabling them to make considered choices to have children when they are emotionally, occupationally, financially, and socially ready. The widened permissibility of this technology thus furthers the Saudi strategy's stated aims of enhancing the well-being and flourishing of women.

Final Thoughts

As more Saudi women join the workforce, establish themselves independently, and wait longer for suitable partners, widened reproductive options through expanded permissibility of oocyte cryopreservation will become even more essential. The concentrated efforts by Saudi oncologists and fertility specialists resulting in the Council's landmark fatwa are further proof not only of the confidence in the safety and efficacy of the technology, but also of its compliance with Islamic law.

Still, more directed research is needed to better understand and anticipate the needs of Saudi patients seeking oocyte cryopreservation. Knowledge of the local population's values and preferences is informative to any future effort at regulating and overseeing the practice. Any ethical consideration of matters

such as privacy and confidentiality, the preservation, handling, or destruction of genetic material, and associated costs and coverage must be culturally sensitive and locally informed, necessitating the need for a widened religious endorsement of oocyte cryopreservation.

There appears to be a precedent for an expanded Islamic permissibility. Recently, some Muslim scholars, including Muslim bioethicists from Saudi Arabia, have indicated their potential support for elective cryopreservation.^{107,108,109} Absent a fundamental conflict with Islamic law, evidence of significant harm or burden, or reasonable ethical concern, oocyte cryopreservation should be made available to all women likely to benefit. Given Saudi Arabia's current economic and cultural transformation, and its reliance on women as the representatives of its revolutionary Vision 2030 plan, widened permissibility of oocyte cryopreservation is more essential than ever.

Conflict of Interest. The author declares none.

Notes

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3. Saudi Vision 2030; available at <https://www.vision2030.gov.sa/en> (last accessed 28 February 2021).
4. Although this work alludes to a collective Islamic and Saudi conscious, it does so for the sake of simplicity and clarity. It should not be understood as an exhaustive examination of Islam, Islamic law, or Saudi society. Similarly, this article does not intend to essentialize all Muslims or Saudis to their religious or cultural identity, or to suggest that all persons who identify as Muslim or Saudi await Islamic judicial rulings before acting.
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17. Recent technology enabling the retrieval of ovarian cortical tissue—and thus a large number of oocytes—permits cryopreservation when the need for immediate therapy precludes sufficient time for ovulation induction and oocyte maturation, or when cryopreservation is indicated in a prepubertal patient. At this time, however, ovarian cortical tissue preservation is considered an experimental technology due to its variable efficacy.

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25. See note 18, Inhorn et al. 2020.
26. See note 2, Goold 2017.
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28. See note 8, Argyle et al. 2016.
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46. Some experts have argued that it is more beneficial to challenge discriminatory social structures that force women to choose between motherhood and career advancement, rather than argue in support of costly and potentially burdensome ART such as oocyte cryopreservation. Others contend that both efforts can, and should, occur at the same time.
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60. See note 1, Senior Council of Scholars 2019.
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66. See note 52, Chamis-Pasha, Albar 2015.
67. Accordingly, Sunni Muslim scholars prohibit ARTs such as surrogate pregnancies, or the use of donated gametes or embryos.
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87. See note 11, Strauss III et al. 2019.
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89. See note 34, Borovecki et al. 2018.
90. Islamic law is intended to accommodate new viewpoints, including those of new scientific knowledge, so long as they do not fundamentally conflict with its basic tenets.
91. This principle is often utilized to weigh and balance the teachings of Sharia. For example, Sharia enjoins the preservation of life and health. It also prohibits the consumption of pig products. As such, Muslim patients may prefer to avoid porcine cardiac valves. However, if these are the only available products, and their use is deemed essential to the preservation of life or health, their use may be permitted under the principle of necessity.
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107. See [note 52](#), Chamis-Pasha, Albar 2015.
108. See [note 54](#), Serour 2008.
109. Islam’s promotion of pronatalism and its acknowledgment of reproduction as a fundamental life goal is likely an essential reason scholarly thinking has shifted on the permissibility of cryopreservation.