

## Short review

# A Review of Oncologist's Knowledge and Awareness Regarding Fertility Preservation

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### Abstract

The recent quantum leaps in various management modalities in oncology have led to unanticipated survival rates. This has constituted a plea for amelioration in the quality of life of cancer patients of reproductive age, at the core of which is Fertility Preservation (FP). Less than 50% of oncologists refer cancer patients for FP. One of the principal reasons behind these limited referral rates is the oncologists' lack of sufficient knowledge and awareness concerning different FP modalities. In this review, we provide an overview of oncologists' perception towards FP for cancer patients and discuss recent literature regarding the knowledge and attitude of oncologists regarding FP, including oncologists in Lebanon. We also discuss limitations that hinder applying FP widely and suggest future prospects. We conclude that the presence of a multidisciplinary team is pivotal to overcome barriers that hinder the provision of FP services in an effort to optimize patients' satisfaction and long-term quality of life.

**Keywords:** Cancer patients; Fertility preservation; Knowledge; Oncologists; Practice

### Introduction

The recent quantum leaps in various management modalities in oncology encompassing early detection, precise diagnosis, and targeted therapies, have led to unanticipated survival rates among cancer patients. This has further paved the way for a myriad of advancements in improvement of the quality of life of cancer patients of reproductive age, at the core of which is Fertility Preservation (FP). The reproductive potential of cancer patients can be adversely affected by various factors including age, cancer type, and cancer treatment

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**Citation:** Fahs D, Kojok D, Ghazeeri G (2021) A Review of Oncologists' Knowledge and Awareness Regarding Fertility Preservation. J Reprod Med Gynecol Obstet 6: 084.

**Received:** October 20, 2021; **Accepted:** October 28, 2021; **Published:** November 04, 2021

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options. Abdomino-pelvic radiation and high-risk chemotherapeutic agents such as alkylating agents are renowned for their associated gonadotoxicity.

Despite patients being initially overwhelmed with their cancer diagnosis, oncologists should insist on providing patients with the wide array of options for FP ranging from oocyte/embryo/ ovarian tissue preservation to ovarian transposition prior to radiation therapy [1]. While FP is a leading concern to many reproductive-aged cancer patients who have not yet established a family at the time of their diagnosis, most cancer survivors do not recall discussing this with their oncologists [2,3]. Cancer patients who had the opportunity to undergo any FP procedure are better able to cope with their cancer [4], whereas patients who remain with no hope of conceiving a child often experience worsening in anxiety, depression and grief [5]. In this review, we provide an overview of oncologists' perception towards FP for cancer patients and discuss recent literature regarding the knowledge and attitude of oncologists regarding FP, including oncologists in Lebanon. We also discuss limitations that hinder applying FP widely and suggest future prospects.

### Importance of FP Approach For Oncology Patients

Timing of initiation of cancer treatment is a major survival factor for cancer patients, and it is essential that FP is discussed and undertaken as early as possible and prior to initiation treatment. Potential current FP options include emergency embryo and oocyte cryopreservation, ovarian tissue freezing and sperm banking [6]. It is also well established that the success rate of FP and subsequent live birth rates post-survival is highly dependent on the type and timing of FP, the type of cancer treatment and the overall wellbeing of the patient [7]. Early awareness of FP at the time of diagnosis is therefore paramount to a satisfactory outcome for patients. A proactive approach to FP is essential by oncologists throughout all stages of treatment due to their key role in raising awareness of FP options. Oncologists are obliged to recommend and discuss FP as a way to avoid future sterility and safeguard a cancer survivor's future fertility [8].

### Knowledge and attitudes of oncologists towards FP

Despite the amelioration of FP modalities as well as the publication of different FP guidelines by different societies, studies on FP referrals by oncologists found that less than 50% refer cancer patients of childbearing age to a reproductive endocrinologist [9]. Both the American Society of Clinical Oncology (ASCO) and the National Comprehensive Cancer Network (NCCN) published guidelines regarding FP that urge oncologists to inform patients about treatment-related infertility risks as well as FP options as early as possible and expedite appropriate referrals to reproductive specialists.

One of the main limitations behind the low referral FP rates is unexpectedly the oncologists' lack of sufficient knowledge and awareness concerning different FP modalities [10]. Referrals are also lagging for a variety of reasons, including financial and time constraints, concerns about FP procedure safety, apprehension about cancer recurrence during pregnancy and mother-to-child transmission of cancer

[11-13]. A nationwide survey of oncologists conducted by Forman et al., indicated that although more than 80% of healthcare providers routinely discuss a treatment's impact on fertility with their patients, only 39% routinely referred patients to a specialist in reproductive medicine [14]. A narrower pilot survey aiming to evaluate the attitude and knowledge of Ontario oncologists towards FP reported that 74% of the physicians, indicated that they rarely or never modified cancer treatment due to concern about future fertility. Although the study shows oncologists' positive attitudes toward FP, the vast majority did not have patient brochures and educational materials to facilitate FP counseling [15]. Another recent cross-sectional study in evaluating pediatric oncologists showed that more than half routinely discussed the possible influence of treatment on their fertility status. Statistically, oncologists in Sweden discussed FP services with 62% of their male patients and 57% of their female patients [16]. Zhang et al., conducted a systematic review that evaluates FP educational programs for healthcare providers in the United States who care for cancer patients. The review emphasized that in order to enhance the number of cancer patients of reproductive age that undertake FP services, multidisciplinary healthcare specialists should be proficient in the area of fertility to provide sufficient counseling [17].

In an effort to address the issue of awareness and knowledge of oncologists about FP, an oncology-specific cancer and fertility platform was established in 2012 [18]. It consisted of a website that encompassed communication tools, updated information, and ready scripts for fertility counseling. The knowledge and practices of oncologists after 3 years of using the Cancer and Fertility Platform were evaluated, and it was found that oncologists referred a significantly higher number of patients for FP after using the platform [11]. Additional useful tools include the International oncofertility models of care that aim at improving knowledge on FP referrals [19]. Most importantly, a multidisciplinary team including an oncologist, a fertility specialist, a nurse counsellor, and a mental health professional is essential to provide optimal care [11].

### FP practices among Lebanese oncologists

Dedicated FP units comprise multidisciplinary specialists that aim at providing the latest advancements in preserving fertility in addition to appropriate fertility counselling to patients. In Lebanon, no dedicated FP centers are available until now. The only commonly offered method of FP is sperm/oocyte/embryo cryopreservation. The lack of governmental and private insurance funding of FP treatment further worsens the financial burden faced by oncology patients and deems the option of safeguarding future reproductive potential rather far-fetched.

In a previous study conducted by Ghazeeri et al., in 2012, 90% of healthcare providers and 94% of oncologists declared that FP should be discussed with patient before they start their treatment course. The study presented a gender bias in relation to patients being informed of their FP options, as well as conflicting knowledge of FP options available in Lebanon among oncologists. Healthcare providers were more likely to have accurate knowledge of FP options and treatment when compared to oncologists. Oncologists in Lebanon had poor knowledge regarding FP options, success rates, and cost [20]. Moreover, in 2018, a study by Khalifeh et al., reported that in case of female adolescent cancer patients in Lebanon, FP was not discussed and offered to parents in 85.6% of the cases [21]. The mentioned studies highlight the need to develop a FP program and a multidisciplinary team of oncologists and healthcare providers, that would provide patients and

parents with fertility consult before starting any cancer therapy. Despite the availability of a myriad of FP treatment modalities, practice in Lebanon is constantly hampered by paucity in overall awareness and knowledge about FP.

### Limitations and Future Prospects

Fortunately, the demand for healthcare providers to receive more education in FP has been increasingly recognized. Over the last several years, more light has been shed on survivors' fertility issues due to the improvements in the prognoses of cancer patients. However, the persistence of a distressing knowledge gap whereby oncologists often fail to discuss the associated gonadotoxicity associated with oncology treatments prior to treatment initiation. Research has emphasized that patients (males, females, children, and adolescents) diagnosed with cancer do not routinely get FP counselling and appropriate referrals due to various reasons including prioritizing direct start of treatment by oncologists [7].

Despite growing interest in the field of FP, the lack of high-quality evidence including large prospective cohort studies and randomized studies on these topics continues to hinder the robustness of the leading societies' recommendations. This further highlights the need for further future research efforts. Several ongoing registries and prospective studies are aiming at evaluating feasibility, safety and efficacy of fertility preserving strategies in cancer patients. Encouraging patient participation in these studies is hence crucial to acquire more robust conclusions. This information gap immensely impedes the ability of oncology patients to take proactive steps to help safeguard their future fertility potential prior to fertility-compromising cancer treatments [22]. Options for FP among cancer patients are wide and complex, as they vary by cancer diagnosis, treatment factors, patient gender, patient age, economic background and access to resources. This further emphasizes the need for optimal knowledge and awareness by the multidisciplinary specialist teams.

Future studies should be specifically aimed at evaluating FP awareness programs and calling for updated ones. In addition, studies addressing the psychological impact of FP counselling and treatments on oncology patients should be conducted.

### Conclusion

The higher survival rates among oncology patients deem FP as one of the top priorities during care of cancer patients. Safeguarding the patients' reproductive potential prior to gonadotoxic treatment should be of prime importance. It is the specialist's duty to integrate the topic of FP in patient consultations and have continuing conversations over the course of multiple visits as per each patient's needs. Thus, oncologists and healthcare providers are encouraged to combine efforts and knowledge to overcome barriers that hinder the provision of FP services in an effort to optimize patients' satisfaction and long-term quality of life.

### Ethical Issues

Not applicable.

### Conflict of Interest

The author has no conflicts of interest to disclose.

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