

## Updates on Preservation of Female Fertility in Cancer Patients: A Systematic Review and Meta-analysis

Fawaz E Edris, MD\* Iman Hamid Alenezi, MD\*\* Ahmed Baker A Alshaikh, MD, PhD\*\*\* Nada Majed AlFarrah\*\*\*\* Jinan Ali Al-Fadhel\*\*\*\* Sama Ahmed Hashim\*\*\*\* Faye Faisal Afandy\*\*\*\* Nouf Abdullrhman Alballaa\*\*\*\* Jumanah Y. Nassar\*\*\*\*

### ABSTRACT

**Objectives:** To analyze the reproductive results following two of the main techniques of fertility preservation (FP): embryo cryopreservation (Controlled ovarian stimulation, COS) and frozen-thawed embryo transfer (FTET) in female cancer patients and survivors.

**Methods:** PubMed, Web of Science, Scopus, Science Direct, and Clinical Key were systematically searched in July 2024 to comprise the relevant data. Comprehensive Meta-Analysis (Version 3.0) was the software used for data analyses.

**Results:** Our results included fifteen studies with a total of 1098 female cancer patients/ survivors who underwent FP methods. The follow-up duration ranged from 0.25 years to 23.6 years. The clinical pregnancy rate among female cancer patients/ survivors who underwent embryo cryopreservation (COS method) was (27.3%, 95% CI 0.234-0.315,  $p=0.000$ ), the live birth rate was (27.3%, 95% CI 0.234-0.315,  $p=0.000$ ), and the miscarriage rate was (23.8%, 95% CI 0.234-0.315,  $p=0.000$ ). While subjects who underwent FTET revealed a pooled prevalence of clinical pregnancy of (61.5%, 95% CI 0.234-0.315,  $p=0.049$ ) and the live birth rate was (49.3%, 95% CI 0.234-0.315,  $p=0.905$ ).

**Conclusion:** Our findings can help practitioners counsel women regarding FP approaches. A combination of diverse strategies may be the best solution, although this requires further exploration. Longitudinal studies could be the first step in improving the literature's quality, with international criteria requiring that the same factors be reported consistently.

**Keywords:** Fertility preservation; Embryo cryopreservation; Frozen-thawed embryo transfer; Pregnancy; Live birth rate; Miscarriage; Systematic review; Meta-analysis.

*Bahrain Med Bull 2025; 47 (1): 2642-2649*

---

\* Department of Obstetrics and Gynecology, College of Medicine  
Umm AlQura University, Makkah, Saudi Arabia.

Email: faedris@uqu.edu.sa

\*\* Department of Obstetrics and Gynecology, Ministry of Health  
Arar, Kingdom of Saudi Arabia.

Email: Ihalenezi@moh.gov.sa

\*\*\* Department of Obstetrics and Gynecology, College of Medicine  
Jouf University, Sakaka, Kingdom of Saudi Arabia.

\*\*\*\* Medicine Program, Batterjee Medical College, Jeddah 21442  
Saudi Arabia.