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INPLASY

Fertility counselling in men with cancer: a systematic review and meta-analysis of prevalence, heterogeneity and unmet supportive care need

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ADMINISTRATIVE INFORMATION

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Review stage at the time of initial registration - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 24 November 2026 and was last updated on 24 November 2026.

INTRODUCTION

Review question / Objective In men with cancer or with a history of cancer, what proportion receive fertility counselling, fertility-risk information or referral before or during gonadotoxic treatment; which study-level characteristics explain the between-study variation in that proportion; what is the prevalence of high fertility-related distress or reproductive concern; and what unmet fertility-related information and support needs do men report? P: male patients with cancer and male cancer survivors of any age, including mixed-sex studies in which male-specific data can be separated. E (exposure/outcome domain): receipt of fertility counselling, fertility-risk information or referral; fertility-related distress or reproductive concern; unmet fertility-related supportive care need; decisional regret. C: not applicable (prevalence and descriptive synthesis). O: primary – male-specific proportion receiving fertility counselling, fertility-risk information or referral; secondary – prevalence of high fertility-related distress, unmet need, and correlates of counselling. S: observational studies of any design, qualitative studies, quality-improvement reports and trials of decision support.

Rationale Fertility is a standard component of supportive care for people treated for cancer during their reproductive years. ASCO, ESMO and EAU guidelines each recommend that fertility risk and preservation options be discussed before gonadotoxic treatment begins. Sperm cryopreservation is less invasive, less time-critical and more widely available than oocyte or embryo cryopreservation, yet men appear to be counselled less often than women. In a population-level claims analysis of 5,907 men treated with orchiectomy for testicular cancer, 9.5% had a fertility preservation counselling code; in a quality-improvement audit of 6,976 patients at United States oncology practices, infertility risk was discussed with 32% of men against 56% of women. Published male-specific proportions span almost the entire possible range, from 4.0% to 97.5%, and three

explanations are usually offered: that care differs between settings; that studies measure receipt differently (billing codes, chart review, patient recall); and that they measure different constructs (counselling, information provision, referral). No previous review has tested these explanations, and none has assembled male-specific estimates. This review therefore estimates the pooled proportion, tests eight prespecified study-level characteristics with adjustment for multiple testing, and synthesises distress and unmet need.

Condition being studied Cancer in men of reproductive age and in male survivors of cancer treated during childhood, adolescence or adulthood. Gonadotoxic exposure includes alkylating chemotherapy, testicular or pelvic radiotherapy, total body irradiation, pelvic surgery and conditioning before haematopoietic stem cell transplantation. The condition of interest is not the cancer itself but the supportive care process that should accompany gonadotoxic treatment: whether fertility risk and preservation options are discussed, whether distress about fertility is recognised, and whether information and support needs are met. Failure of that process has consequences that outlast cancer treatment, including decisional regret, impaired intimate relationships, and the loss of the option of biological parenthood without informed consent.

METHODS

Search strategy Four databases were searched between 21 and 23 November 2026, without language restriction, for records published 2010 to 2026. Each string combined five blocks: cancer; male sex; fertility or fertility preservation; counselling, information need, distress, reproductive concern, decisional regret or communication; and a date limit.

PubMed (746 records): ("Neoplasms"[Mesh] OR cancer[tiab] OR neoplasm*[tiab] OR tumor*[tiab] OR tumour*[tiab] OR malignan*[tiab] OR oncology[tiab]) AND ("Male"[Mesh] OR male[tiab] OR men[tiab] OR boys[tiab]) AND ("Fertility Preservation"[Mesh] OR fertility[tiab] OR infertility[tiab] OR oncofertility[tiab] OR "reproductive health"[tiab] OR "sperm banking"[tiab]) AND ("Counseling"[Mesh] OR counsel*[tiab] OR "information need*"[tiab] OR "unmet need*"[tiab] OR "fertility-related distress"[tiab] OR "fertility concern*"[tiab] OR "reproductive concern*"[tiab] OR "decisional regret"[tiab] OR "decision regret"[tiab] OR communication[tiab]) AND 2010:2026[dp].

EBSCOhost CINAHL Complete and Academic Search Premier (306 records): the same four concept blocks using TI/AB field codes, limited to 2010-01-01 to 2026-12-31.

Web of Science Core Collection, SCIE/SSCI/ESCI (878 records): TS=(cancer OR cancers OR neoplasm* OR tumor* OR tumour* OR malignan* OR oncology) AND TS=(male OR males OR men OR boy OR boys) AND TS=(fertility OR infertility OR oncofertility OR "fertility preservation" OR "sperm banking" OR "semen cryopreservation") AND TS=(counsel* OR "information need" OR "unmet need" OR distress OR concern* OR "decision regret" OR communication) AND PY=(2010-2026).

Scopus (2,821 records): TITLE-ABS-KEY of the same four blocks, AND PUBYEAR > 2009 AND PUBYEAR < 2027; the interface year filter did not apply, so out-of-window records were removed after retrieval.

Reference lists of all included studies and of two recent reviews were hand-searched. The full strings are reproduced in the protocol document and in Supplementary S1 of the manuscript.

Participant or population Male patients with cancer and male cancer survivors of any age, treated with any gonadotoxic modality, in any health system. Mixed-sex studies were eligible when a male-specific numerator and denominator could be separated. No restriction on age at diagnosis or at survey.

Intervention Not an intervention review. The exposure of interest is the supportive care process itself: receipt of fertility counselling, fertility-risk information or referral to fertility preservation, as reported by patients or documented in records. Additional domains were fertility-related distress or reproductive concern, unmet fertility-related information and support need, and decisional regret.

Comparator Not applicable. This is a systematic review of prevalence with a descriptive and meta-analytic synthesis; no comparator group is defined. Where studies reported an internal contrast (for example men versus women in the same cohort), that contrast was reported descriptively and not pooled.

Study designs to be included Observational studies of any design (cross-sectional surveys, record or claims reviews, registry and population surveys, cohort studies), qualitative studies, quality-improvement reports, and trials of decision support. Excluded: protocols, letters, narrative reviews, studies reporting only clinical fertility outcomes (semen parameters, cryopreservation uptake, live birth, paternity), provider-perspective

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studies without patient-level or caregiver-level data, and duplicate reports of an included cohort.

Eligibility criteria Inclusion: primary studies enrolling male patients with cancer or male survivors; reporting a male-specific numerator and denominator for receipt of fertility counselling, fertility-risk information or referral, for fertility-related distress or reproductive concern, or for unmet fertility-related need; any observational design, qualitative study, quality-improvement report or decision-support trial; published 2010-2026. Exclusion: clinical fertility outcomes only; provider perspective without patient-level or caregiver-level data; protocols, letters and narrative reviews; duplicate reports of an included cohort; no extractable male-specific data after author contact.

Information sources PubMed (MEDLINE), 21 November 2026; EBSCOhost (CINAHL Complete and Academic Search Premier), 23 November 2026; Web of Science Core Collection (SCIE, SSCI, ESCI), 23 November 2026; Scopus, 23 November 2026. Reference lists of all included studies and of two recent reviews were hand-searched. Embase and PsycINFO were not searched; this is stated as a limitation.

Main outcome(s) Male-specific proportion of men receiving fertility counselling, fertility-risk information or referral to fertility preservation. Pooled on the logit scale with a random-effects generalised linear mixed model, with Hartung-Knapp confidence intervals and a 95% prediction interval.

Additional outcome(s) Prevalence of high fertility-related distress or reproductive concern; unmet fertility-related information and support needs (synthesised narratively because the reported quantities were not commensurable); decisional regret; study-level correlates of counselling and of progression to preservation.

Data management For each study we extracted country, design, setting, cancer type, age range, total and male sample size, response rate, the definition, provider and timing of counselling, the instrument used, and every outcome numerator and denominator, each verified against the source article. The extraction table, the item-level appraisal table, the analysis dataset, the service and age codings and the R code are supplied with the manuscript so that every estimate can be reproduced.

Quality assessment / Risk of bias analysis Joanna Briggs Institute prevalence checklist (9 items), analytical cross-sectional checklist (8 items) and qualitative checklist (10 items), selected according to design; one measurement study without a prevalence outcome was appraised with COSMIN. Judgements were made item by item with a written justification for each.

Strategy of data synthesis Prevalence was pooled on the logit scale with a random-effects generalised linear mixed model fitted by maximum likelihood, with Hartung-Knapp confidence intervals and a 95% prediction interval; heterogeneity was reported as I-squared, tau-squared and a 95% prediction interval. Eight prespecified study-level characteristics were each tested in a separate univariable meta-regression, with Bonferroni-adjusted p values treated as the primary inference; variance explained was computed directly as (tau-squared null minus tau-squared model) divided by tau-squared null. Unmet need was synthesised narratively by theme.

Subgroup analysis Eight prespecified moderators: ascertainment method (patient self-report, chart or register documentation, insurance claims, provider audit), construct measured (counselling, information, referral), age band (adolescent and young adult or paediatric versus adult), region, study size (log10), cancer type, organised oncofertility pathway, and publication year.

Sensitivity analysis Inverse-variance pooling with restricted maximum likelihood tau-squared; Freeman-Tukey double arcsine transformation; leave-one-out refitting; inclusion of a wider pool of studies measuring a related but non-equivalent construct; and an Egger-type regression test with a funnel plot for small-study effects.

Language restriction No language restriction was applied at any stage.

Country(ies) involved China (authors' affiliation). Included studies: North America 54, Europe 38, Asia 10, Oceania 5, Middle East 4, South America 2, Africa 2, not reported 3.

Other relevant information Registration is retrospective: the review was designed and completed before registration, and the record exists so that the eligibility criteria, the eight prespecified moderators and the analysis plan are publicly documented alongside the manuscript. The manuscript states this in Methods and in the Limitations. Deviations from the original plan are reported openly: three databases were added after

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the initial PubMed search, so duplicate screening was sequential rather than fully parallel; the Scopus year filter failed and 630 out-of-window records were removed after retrieval; the EBSCOhost export was capped at 201 of 306 records; age band was initially coded from free-text age ranges and was recoded against the population each study recruited, which removed an apparent effect; variance explained and the omnibus statistic were initially mis-scaled and were recomputed. A separate systematic review and evidence map by the same group, on whether the spermatogenic dose threshold shifts with age at exposure, is registered as INPLASY2026100127 (doi:10.37766/inplasy2026.10.0127) and does not overlap with this review in question, population or outcomes. Generative artificial intelligence tools assisted with the automated retrieval and organisation of full-text articles and with language editing; every article was checked by the authors and all inclusion decisions were confirmed manually against the source. Data availability: search strategies, extraction table, appraisal table, analysis dataset, codings and R code are supplied with the manuscript.

Keywords oncofertility; male cancer survivors; supportive care needs; fertility counselling; heterogeneity; meta-analysis.

Dissemination plans Submission of the completed systematic review to Supportive Care in Cancer. The search strategies, extraction table, appraisal table, analysis dataset, service and age codings and R code are supplied with the manuscript so that every estimate can be reproduced. No embargo is planned, and the record will be updated to 'Completed and published' once the article is accepted.

Contributions of each author

Author 1 - Mengyao Yin - First screening pass, data extraction and critical appraisal; revision of the manuscript.
Author 2 - Qianyu Wang - First screening pass, data extraction and critical appraisal; verification of extracted data.
Author 3 - Mingzheng Li - First screening pass, data extraction and critical appraisal; preparation of tables.
Author 4 - Zihan Zhao - First screening pass, data extraction and critical appraisal; reference checking.
Author 5 - Jiahui Zhou - Contribution to the interpretation of the results; critical revision of the manuscript.
Author 6 - Bin Zheng - Contribution to the interpretation of the results; critical revision of the manuscript.
Author 7 - Linxi Li - Conception of the review, design of the search, statistical analysis and drafting of the manuscript; guarantor of the protocol.

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