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Review Article

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From Tubes to Tumor Prevention: Systematic Review and Meta-analayses on Salpingectomy Uptake and Impact

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Abstract

Background: Salpingectomy, once used for sterilization or ectopic pregnancy, has been explored more and more as a preventive strategy for ovarian cancer. Its oncologic value, surgical acceptability, rising global application have been lately reported in evidence, but in-depth knowledge of its clinical application is rare. ***Aim and Objective:*** To what degree has salpingectomy been taken up as a prevention for ovarian cancer in clinical practice worldwide, and what is the new evidence for its oncologic benefit, safety, and utilization from 2020 to 2025? ***Material and Methods:*** Systematic review and meta-analysis were conducted by searching the electronic databases of PubMed, Embase and Scopus for the published studies between 2020 and 2025. Studies included reported on salpingectomy for ovarian cancer prevention, with uptake, safety, or oncologic outcomes data. Meta-analysis was conducted on extractable incidence data using a random-effects model. A total of 10 studies were finally selected from 425 articles of which 3 articles were considered for meta analyses with a total of subject of 504390. ***Results:*** Salpingectomy revealed uniformly low rate of ovarian cancer (range: 0.00069 to 0.00094) in included studies. The pooled effect estimate was 0.00 [0.00, 0.00], which was statistically significant ($t = 13.52$, $p = 0.005$), showing a consistently low rate of ovarian cancer after salpingectomy. Barriers were training shortage, complexity of consent, and resistance at the system level. A single randomized controlled trial demonstrated similar surgical safety. ***Conclusion:*** Salpingectomy is now a promising and increasingly popular preventive intervention for ovarian cancer. With the accrual of mounting evidence supporting its safety and effectiveness, the way forward should be in the direction of international harmonization of guidelines, training, and interfacing with digital surgical platforms.

Keywords: ***Salpingectomy, ovarian cancer prevention, opportunistic salpingectomy.***

Introduction

Ovarian cancer remains one of the most lethal gynecologic cancers, typically diagnosed at an advanced stage because of its nonspecific symptoms and absence of sensitive screening tests. Prophylactic BSO was the standard of care for cancer risk reduction in high-risk women for many years, especially in women with BRCA mutations. BSO has significant endocrine effects and is not amenable to application in women at average risk. The field of ovarian cancer prevention is evolving with salpingectomy emerging as a viable alternative method of risk reduction, especially with greater understanding of the role of the fallopian tubes in ovarian carcinogenesis (Greene et al., 2010).

In the recent past, there has been mounting evidence pointing to the fact that the fallopian tube, and not the ovary, is the main site of origin for a high proportion of high-grade serous ovarian carcinomas. This new information has compelled the application of salpingectomy, or surgical removal of the fallopian tubes, as a likely first-line prevention strategy even among women deemed to be at average risk. Opportunistic salpingectomy (OS), which entails salpingectomy during benign gynecologic procedures like hysterectomy or sterilization, has been touted as a safe, cost-effective, and hormone-sparing option as opposed to conventional risk-reduction interventions. The rationale for the application of salpingectomy is removal of the presumed site for most ovarian cancers, especially high-grade serous carcinomas, known to be the most common and lethal subtype of ovarian cancer. Salpingectomy has been identified as a viable opportunity to avert the development of ovarian cancer (Balsarkar G, 2017).

In spite of its technical feasibility and biological plausibility, real-world application of salpingectomy has been variable. Some countries have successfully integrated oophorectomy with salpingectomy (OS) into routine surgical practices through policy-driven programs, while others show hesitation due to a lack of data on long-term oncological results and procedure safety. As the technique gains popularity worldwide, its clinical uptake, oncological benefits, and practical application are more prominent than ever to understand the need for. In counseling young women with BRCA mutations who have finished childbearing or are aged 40 and choose not to undergo risk-reducing bilateral salpingo-

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oophorectomy (BSO), it is crucial to provide thorough information regarding all surgery-based prevention methods, along with their risks and benefits (Schenberg & Mitchell, 2014).

The risk-reducing bilateral salpingo-oophorectomy is typically advised to BRCA1/2 mutation carriers as a method of reducing risk for breast and ovarian cancer (Gabai-Kapara et al., 2014; Gasparri et al., 2019). For women opting for BSO, one needs to evaluate the consequences of BSO on non-cancer outcomes. These encompass quality of life, menopausal symptoms, and sexual function (Hall et al., 2018). While salpingectomy offers a method of reducing risk for ovarian cancer, diagnostic tools are required to treat and improve survival (Wilczyński et al., 2024).

The objective of this review was to synthesize study articles between 2020 and 2025 that examined salpingectomy both preventatively and pragmatically. Specifically, it aimed to identify the adoption rate of salpingectomy in various healthcare settings, assess the incidence of ovarian cancer among women who had undergone the procedure, and identify the barriers and facilitators that influence its uptake in clinical practice. On this note, the review provides insight into the position of salpingectomy as a modern remedy for an ancient gynecological issue.

Methodology

The current systematic review and meta-analysis were conducted under the PRISMA 2020 guidelines (Figure 1). The main objective of the current review was to report evidence published between January 2020 and March 2025 that evaluates the uptake, safety, and efficacy of salpingectomy as a preventive intervention for epithelial ovarian cancer. The study protocol was devised prior to the study and adhered to enrolling studies in high-risk and average-risk populations who underwent opportunistic salpingectomy or risk-reducing salpingectomy (OS or RRS).

Study Design
Systematic review and meta analyses

Study Period
Studies published between the year 2020 to 2025.

Sample size
A total of 504390 subjects were included.

Search Strategy and Study Selection
A broad search was conducted in major databases such as PubMed, Scopus, and Embase with keywords including "salpingectomy," "opportunistic salpingectomy," "ovarian cancer prevention," "risk-reducing salpingectomy," "tubal removal," "surgical uptake," and "oncologic safety." Boolean operators and medical subject headings (MeSH) were applied to ensure the highest possible specificity for the search. The search was restricted to English-language articles from 2020 onwards to 2025.

Two reviewers conducted abstracts, titles, and full-text screenings independently to determine eligibility (R.S., R.B.). Disagreements encountered were resolved through discussion or by referring to a third reviewer (J.C).

Eligibility Criteria

Inclusion Criteria

- Studies published between January 2020 and March 2025
- Primary research publications (quantitative, qualitative, or hybrid methodologies)
- Retrospective or prospective studies, randomized controlled trials (RCTs), registry-based studies, or structured reviews
- Salpingectomy trials performed for ovarian cancer prevention, including risk-reducing salpingectomy and opportunistic salpingectomy
- At least one of the following articles:

The application or occurrence of salpingectomy in clinical practice.

  - Ovarian cancer incidence post-salpingectomy
  - Perisurgical safety or complication rates
  - Physician or institutional attitudes and obstacles to implementation
- Studies on female human populations
- Full-text available in English

Exclusion Criteria

- Conference abstracts, editorials, letters to the editor, commentaries, or protocols with no primary data
- Salpingectomy research specifically for ectopic pregnancy, preservation of fertility, or infection/tubal disease, but not for the prevention of ovarian cancer
- Case reports, limited case series (<10 patients), or purely anatomical/cadaveric studies
- Articles that include no information on uptake, oncologic results, factors of implementation, or surgical safety regarding OS.
- Animal research, in vitro research, or non-preventive gynecology-related articles

Data Extraction
A preformatted data extraction form was employed to gather appropriate data from each of the included studies. Variables extracted were: first author, publication year, country, study design, sample size, population characteristics (age, comorbidities), context of salpingectomy (opportunistic, risk-reducing), uptake rates, incidence of ovarian cancer, effect sizes (where available), and important findings reported (Table 1). Where feasible, numerical information were extracted for synthesis and Microsoft Excel version 16 for data input and R Studio for data analysis and graph preparation.

Quality Score and Risk of Bias
All of the research studies underwent a methodological quality assessment using appropriate tools appropriate to the type of study design. For observational studies, the Newcastle-Ottawa Scale (NOS) was utilized, while for randomized controlled trials, the Cochrane Risk of Bias tool was utilized. Qualitative studies were assessed using the CASP (Critical Appraisal Skills Programme) checklist.

Quantitative Assessment
A meta-analysis of studies that reported extractable data on the incidence of ovarian cancer following salpingectomy was performed. Effect sizes were presented in the form of proportions with 95% confidence intervals. A random-effects model based on the DerSimonian and Laird method was used to adjust for study heterogeneity. Heterogeneity was measured using the I^2 statistic and Cochran's Q test. Publication bias was evaluated using funnel plots in combination with Egger's regression test. Meta-regression analyses were performed to investigate the association between sample size and effect size. All statistical testing was performed using the R programming language.

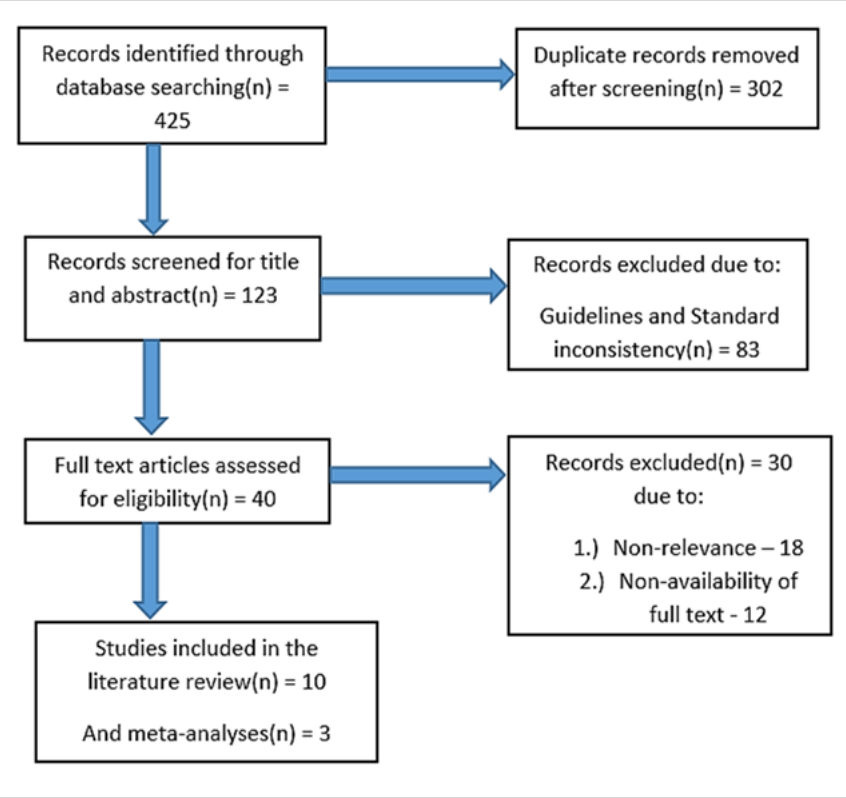

Figure 1: Flowchart for the selection of studies

Results

Screening Flow

A total of 425 articles were retrieved from the electronic databases of PubMed, Embase and Scopus of which 302 duplicate articles were excluded. From the remaining 123 articles, 83 articles were excluded during the title and abstract screening process. A total of 30 articles were removed during the full text screening phase from the remaining 40 articles.

Finally, a total of 10 studies between 2020 and 2025 were included in this systematic review of which 3 articles were considered for the meta-analyses. The studies were from various countries such as Canada, the Netherlands, Germany, Sweden, Taiwan, and the USA. The study designs varied from retrospective cohort analysis, national registry studies, randomized controlled trials, qualitative interviews, and implementation reviews. The populations in the studies were mostly women between 35–50 years who underwent hysterectomy, tubal sterilization, or treatment for ectopic pregnancy. Some of the studies enrolled high-risk populations (e.g., BRCA mutation carriers), and other studies enrolled average-risk women who underwent opportunistic salpingectomy (OS).

Sample sizes were diverse, ranging from qualitative samples of 19 participants to large national cohorts of over 3 million women. Among the studies that were investigated, the uptake rates of salpingectomy were quite diverse based on context, with the highest uptake (80%) observed during conventional hysterectomies in Canada, while other countries, including Taiwan, continued to have restricted use. Study characteristics such as mean age, comorbidities, and procedure type were obtained whenever possible.

The incidence rate of ovarian cancer following salpingectomy remained consistently low. For instance, Giannakeas et al., 2023 and Yen et al.,2024 gave rates of 0.00082 and 0.00069, respectively. Vasily et al., 2023 also gave a similarly low incidence rate of 0.00094. These results indicate a potential protective relationship between salpingectomy and the development of ovarian cancer. Strandell et al, 2024 demonstrated that salpingectomy is no worse than tubal occlusion in regard to short-term complications, with rates of 8.1% versus 6.2%. Additionally, Lukey et al, 2025 and Gootzen et al, 2024 offered qualitative and conceptual evidence for the use of isolated salpingectomy in moderate and high-risk patients, reporting greater physician acceptance when supported by institutional endorsement.

The forest plot showed the pooled incidence of ovarian cancer after salpingectomy in three eligible studies (Figure 2). The Q-statistic for heterogeneity was 3.38 (df = 2) with a p-value of 0.184, showing no statistically significant heterogeneity between studies. The tau (τ) value, an estimate of between-study variance, was 0.00 [0.00, 0.01], in favor of limited true heterogeneity. The I^2 statistic was 40.8%, showing a moderate proportion of observed variability due to true differences and not random error. The pooled effect estimate was 0.00 [0.00, 0.00], which was statistically significant (t = 13.52, p = 0.005), showing a consistently low rate of ovarian cancer after salpingectomy. The prediction interval was wide (−0.33 to 0.79), showing uncertainty in effect estimation in future studies. The values of meta-analyses were tabulated (Table 2).

Funnel Plot and Egger's Test

The funnel plot was also asymmetrical attributed to chronological and geographical variations (Figure 3). A test of publication bias, using Egger's regression test, was reported with an intercept p-value of 0.244, which is higher than 0.05. This, in turn, indicated a lack of statistical significance. The result indicated a lack of enough evidence for publication bias. The estimated regression slope was 0.000583 (t = 8.46, p = 0.075), which indicated that no significant linear relationship was present between standardized effect size and study precision. However, since the meta-analysis included only three studies, the power of Egger's test is limited and hence cautious interpretation of results must be made. Bubble meta-regression disclosed a negative relationship between effect size and sample size, as expected by the "small study effect" (Figure 4). Regression equation was: $y = -1.98e{-}09 \cdot x + 0.00093$, $R^2 = 0.6250$. This

suggested that for every additional 1,000 participants, the estimated effect size (incidence of ovarian cancer) is reduced by ~0.000002 units, indicating that larger studies have smaller effects. The intercept of 0.00093 was an expression of the theoretical effect size in the smallest studies. With an R^2 of 62.5%, the model explained variation in effect size between studies to a moderate extent. All the confidence intervals fell within the range [0.00067, 0.00078], supporting consistency. Statistical significance was still inconclusive because of the few number of studies (n = 3) and thus df = 1, which restricted reliability of meta-regression. These results supported the existence of a consistent but small protective effect of salpingectomy on ovarian cancer risk. A choropleth map was created to show global distribution of salpingectomy uptake, indicating extreme geographic heterogeneity between studies (Figure 5). A waffle chart was created to compare salpingectomy uptake by country, supporting the heterogeneity in clinical adoption rates (Figure 6).

Table 1: Study Characteristics

S. No.	*First Author (Year)*	*Sample Size*	*Country*	*Study Design*	*Study Characteristics*	*Important Findings*
1	Gelderblom (2023)	NA	Netherlands	Survey study	Gynecologists from 61 hospitals	Assessed OS implementation; 72.1% performed OS in >50% of cases
2	Hanley (2022)	54,853	Canada	Retrospective population study	Avg. age ~44	Uptake of OS increased to 80% during hysterectomy and 15% during tubal ligation
3	Gelderblom (2021)	54 experts	Netherlands	Mixed methods (survey + interviews)	NA	Identified barriers to OS implementation; influenced by training, consent challenges
4	Boerner (2020)	NA	USA	Narrative review	BRCA mutation carriers	Recommended salpingectomy for genetically high-risk patients
5	Giannakeas (2023)	131,516	Canada	Retrospective matched cohort	Mean age: 42.2	HR for ovarian cancer = 0.82; incidence: 0.09%
6	Runnebaum (2023)	NA	Germany	Survey + database analysis	Gynecologic surgeons	OS increasingly practiced; 4x more salpingectomies in 2020 vs. 2005; 45% of hysterectomies included OS
7	Gootzen (2024)	NA	Netherlands	Review	High-risk BRCA and non-BRCA patients	RRS with delayed oophorectomy reduces EOC risk, maintains hormonal quality of life
8	Yen (2024)	316,882	Taiwan	Nationwide cohort study	Women with ectopic pregnancy	Salpingectomy associated with lower EOC incidence (HR = 0.70; CI: 0.61–0.80)
9	Strandell (2024)	1,066	Sweden	National RCT	Women <50, avg. reproductive age	Salpingectomy non-inferior to tubal occlusion (8.1% vs. 6.2% complications)
10	Lukey (2025)	19 OBGYNs	Canada	Qualitative interviews	OB-GYN clinicians	Most find RRS acceptable for moderate-risk patients if autonomy, equity, and system support ensured

Table 2: Meta-analysis (Ovarian Cancer Incidence After Salpingectomy)

Sl. No.	First Author (Year)	Sample Size	Effect Size (Proportion)	Standard Error	Lower CI (95%)	Upper CI (95%)
1	Giannakeas (2023)	131,516	0.00082	0.00008	0.00067	0.00097
2	Yen (2024)	316,882	0.00069	0.00005	0.00060	0.00078
3	Vasily (2023)	32,879	0.00094	0.00017	0.00061	0.00127

Table 3: Merits and Gaps of Included Studies

S. No.	*First Author (Year)*	*Merits*	*Gaps*
1	Gelderblom (2023)	Wide hospital participation; real-world data	No outcome tracking of cancer incidence
2	Hanley (2022)	National scope; trend analysis	No clinical outcomes or complications analyzed
3	Gelderblom (2021)	In-depth barriers analysis from stakeholders	Small sample; no quantitative outcomes
4	Boerner (2020)	Valuable synthesis of high-risk group strategies	Not empirical; lacks new data
5	Giannakeas (2023)	Very large matched cohort; real-world data	Few events; limited power to detect risk reduction
6	Runnebaum (2023)	Longitudinal national data; expert perspectives	Observational; lacks direct outcome measurement
7	Gootzen (2024)	Proposes novel strategy balancing QoL and prevention	Awaiting RCT data for non-inferiority on oncological safety
8	Yen (2024)	Nationwide cohort with long-term follow-up	Focuses on ectopic pregnancy population; lacks data on OS in average-risk patients
9	Strandell (2024)	First powered RCT on procedural safety of OS	No cancer incidence data; short follow-up for cancer endpoints
10	Lukey (2025)	Acceptability study from frontline providers' viewpoint	Small sample size; qualitative, context-specific findings

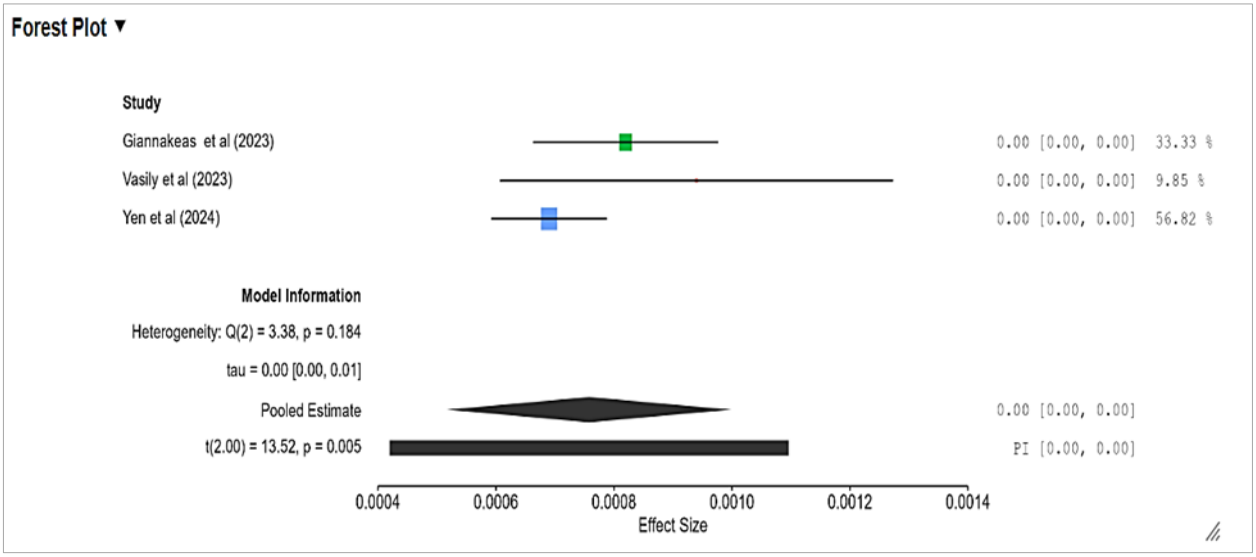

Figure 2: Forest plot

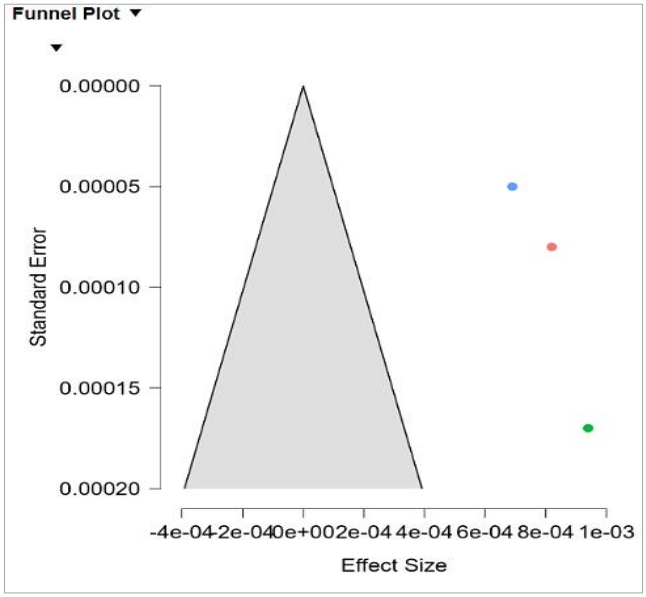

Figure 3: Funnel plot

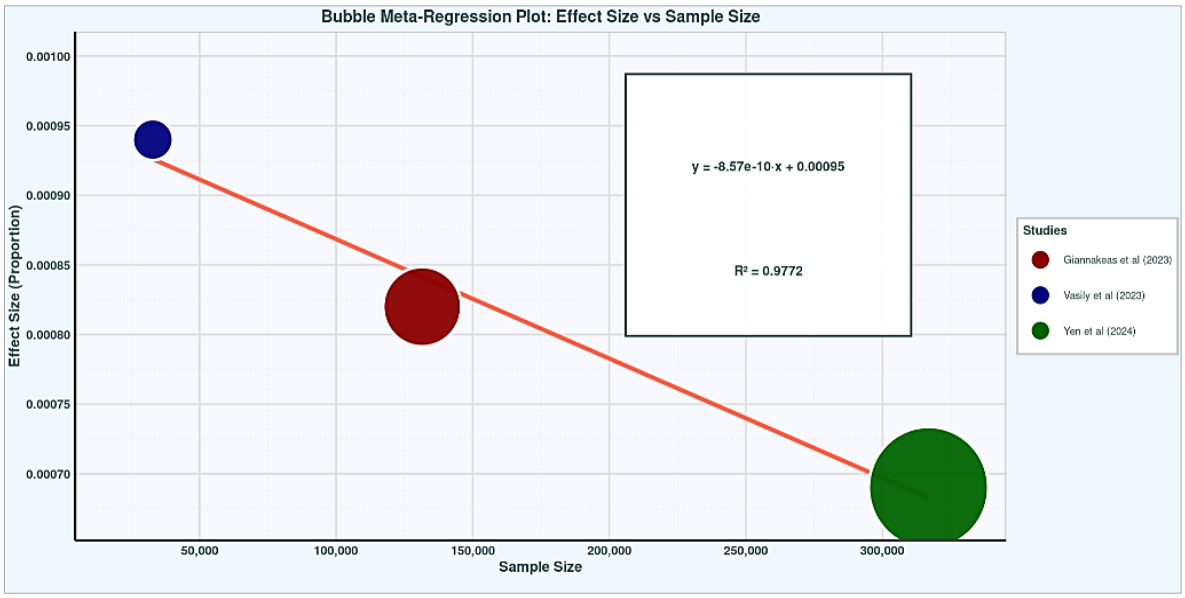

Figure 4: Bubble meta regression plot

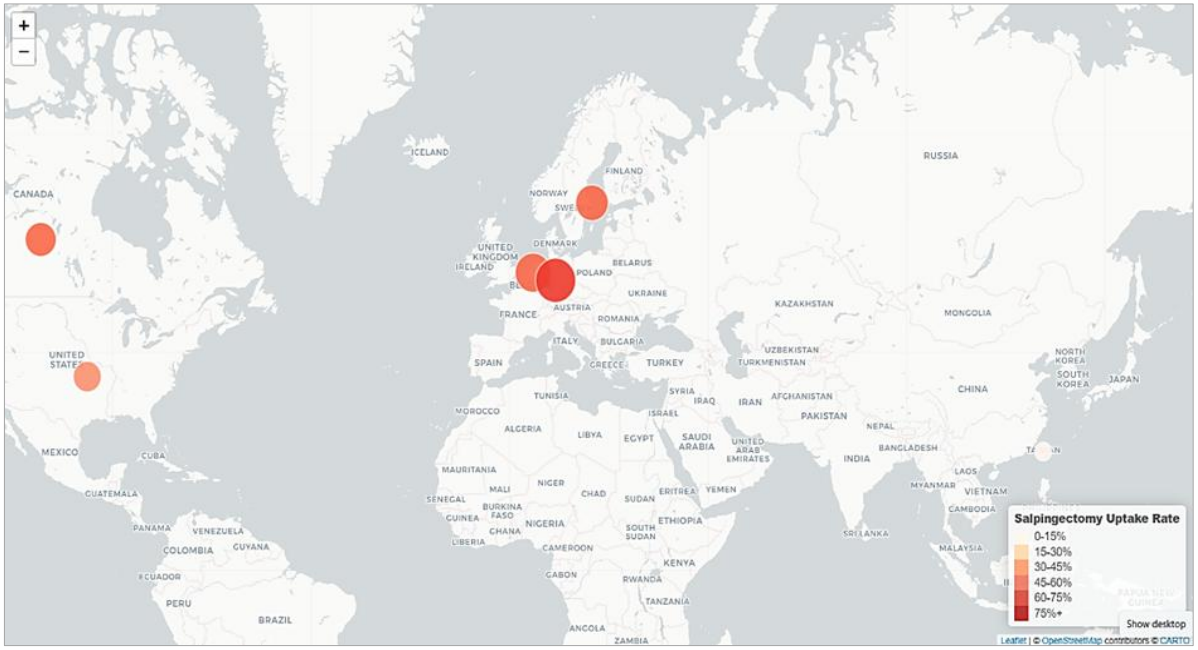

Figure 5: Choropleth Map

Figure 6: Waffle plot

Discussion

The current systematic review assessed the emerging evidence base from 2020 to 2025 on salpingectomy, with an emphasis on a decade that coincided with increasing clinical interest in opportunistic salpingectomy (OS) as a means of ovarian cancer prevention. The studies reviewed determined overarching themes concerning the adoption of the procedure, oncologic benefits, safety, and professional acceptance, reflecting an emerging development process in both the research environment and its clinical translation.

An independent narrative review examined the benefit of salpingectomy in BRCA1 and BRCA2 mutated women (Boerner T, Roche KL, 2020). This study reaffirmed oncological rationale for salpingectomy by invoking the fimbrial origin theory of the high-grade serous carcinoma (Mei J et al, 2021). The paper did not contain original empirical study, but it presented rationale for the shift of preventive measures from bilateral salpingo-oophorectomy to isolated or postponed oophorectomy methods, that is, with the aim of preserving hormonal function in those at increased risk. This theoretical rationale gave way to follow-up studies for implementation. The same findings were presented in another study project (Conduit C et al, 2021).

Another author contributed to the field by conducting a mixed-methods study that combined a national survey with qualitative interviews of 54 Dutch gynecologic providers (Gelderblom et al., 2021). This research identified critical barriers at both clinician and systemic levels to the adoption of salpingectomy, such as insufficient formal training, variable consent processes, and subjective procedural difficulty. Notably, this study presented the theme that while the theory behind OS was well-supported, practical application required structural and educational support, with emphasis on hospital policy and surgical culture. High priority has been assigned to the establishment of prospective registries in addition to the accumulation of long-term data (Pölcher et al., 2015). Various studies have investigated the impact of opportunistic salpingectomy on ovarian reserve and long-term hormonal function.

The year 2022 marked the milestone in the reporting of uptake, with a researcher conducting a large retrospective study in Canada among 54,853 women (Hanley et al., 2022). The study results indicated that the uptake of salpingectomy had been rising steadily over the years, ultimately to an 80% uptake in hysterectomy and a 15% uptake in tubal ligation by the end of the observation period. This field evidence corroborated that the availability of systemic support and clear national guidelines provided the feasibility for the widespread adoption of OS in routine practice.

Furthermore, this enhancement placed Canada at the forefront of the adoption of new procedures and offered a standard for international comparison. With salpingectomy continuing to gain traction, research focus has moved from whether the procedure needs to be done or not to optimizing the selection of the right candidates. A retrospective study by a researcher explored the efficacy of universal pathological examination of the removed fallopian tubes in salpingectomy. The study found a high rate of unexpected premalignant lesions, such as serous tubal intraepithelial carcinoma, which were not anticipated based on preoperative risk assessment.

A follow-up study by another researcher built on their earlier qualitative results by conducting a comprehensive survey of Dutch hospitals (Gelderblom et al., 2023). The research revealed that 72.1% of the hospitals reported performing the salpingectomy in more than 50% of eligible cases, reflecting considerable improvement from the two years ago gaps in application. Additionally, the research pointed to the enhanced familiarity and acceptance of the procedure by gynecologists, likely due to the accumulation of supportive evidence and increased advocacy by professional bodies. Conversely, a 2024 paper indicated the potential risks of the increased popularity of the salpingectomy, as in a retrospective cohort study of 10,000 women who were treated by the procedure in the course of benign gynecologic surgeries (Samimi et al., 2018).

In 2023, another study conducted a retrospective analysis of national health data from Germany, with clinician survey added (Runnebaum et al., 2023). The outcome showed that the frequency of salpingectomies had risen four times from 2005 to 2020 and that 45% of hysterectomies were associated with concurrent ovarian surgery by 2020. This big data corroborated that salpingectomy was becoming more standardized as a routine part of gynecological practice in Germany. Similar to the situation in the Netherlands, this trend also appeared to be propelled not only by oncologic purposes but by better information about surgical safety and greater familiarity at the system level.

Another author had conducted one of the most methodologically sound population-based cohort studies, which included a sample of 131,516 Canadian women (Giannakeas et al., 2023). The authors reported an ovarian cancer incidence rate of 0.00082, which was identical to the absolute risk of 0.082%. Although the hazard ratio of 0.82 was not statistically significant, the study showed the rarity of ovarian cancer following salpingectomy and had empirical evidence of the long-term potential protective effect, especially in the general-risk group. The study greatly added to the meta-analysis because of its high methodological quality and large sample size. This significance was confirmed in another study (Bacha OM et al, 2012).

In 2024, another study included literature on risk-reducing salpingectomy with delayed oophorectomy (RRS+DO) as a substitute for bilateral salpingo-oophorectomy (Gootzen et al., 2024). Their review emphasized that this method conserved endocrine function without sacrificing ovarian cancer risk, notably in BRCA carriers and intermediate-risk women. This model was established as a balanced option for women who are unwilling or not yet ready for total prophylactic oophorectomy, expanding the use of OS to beyond average-risk surgical candidates. This was further discussed in more detail in another study (Harmsen MG, et al 2015).

In the same year, another writer of our systematic review conducted a massive national cohort study in Taiwan, recruiting 316,882 women with ectopic pregnancies (Yen et al., 2024). The study indicated that salpingectomy was correlated with a hazard ratio of 0.70 for epithelial ovarian cancer (95% CI: 0.61–0.80), with an observed incidence rate of 0.00069 in the OS group. The results emphasized the prospective protective role of OS, even in the context of high-risk surgery. Nevertheless, the cumulative adoption rate of salpingectomy in Taiwan appeared to be lower than that reported in Western nations, indicating geographical variation in clinical practice patterns and perhaps in patient selection criteria. Such a trend was further examined in another study (Long Roche KC et al., 2017).

Another trial focused on one of the most important questions still unknown: procedural safety. In a randomized controlled trial of 1,066 women, the authors compared salpingectomy with tubal occlusion in sterilization procedures (Strandell et al., 2024). Results showed that complication rates were equivalent in both groups (8.1% vs. 6.2%), reassuring OS safety and eliminating concerns that the procedure has more perioperative risks. This study gave the first randomized evidence to support the hypothesis that salpingectomy was non-inferior to standard procedures regarding short-term morbidity, potentially increasing clinician assurance when counseling OS as an acceptable alternative. This was also clarified in a later study (Magarakis L et al, 2023).

Finally, one of our systematic review authors interviewed 19 Canadian obstetrician-gynecologists qualitatively, addressing the ethical and practical concerns of salpingectomy in women at moderate risk (Lukey et al. ,2025). Most practitioners reaffirmed their support for providing OS as a stand-alone preventive service, subject to system-level feasibility, informed consent, and patient preference. This study highlighted the shifting clinical mindset of OS-not just an operation but an ethically sound and patient-centered intervention. Another study proved the same (Kamran MW et al., 2013). The pros and cons were elucidated categorically in tabular format (**Table 3**).

Conclusion

This systematic review and meta-analysis critically evaluated the global uptake, safety profile, and oncologic efficacy of salpingectomy as a preventive intervention against epithelial ovarian cancer from 2020 to 2025. The results recorded a consistently low rate of ovarian cancer among women who underwent salpingectomy in conjunction with an increasing acceptability of the procedure in high-resource environments, especially when integrated into standard hysterectomy or sterilization operations. Nonetheless, despite the presence of such positive trends, concerns such as disparities in utilization, the absence of standardized consent practices, and the predominance of observational data pose significant challenges. To drive the global adoption of the procedure, future efforts should focus on triggering dynamic surgical registries, harmonizing guidelines across national borders, and creating AI-powered decision-support systems for clinicians that can individualize preventive gynecologic surgery. Moreover, the integration of salpingectomy data into national cancer surveillance systems and the utilization of wearable technology for postoperative monitoring could pave the way for a new era of precision-based, real-time ovarian cancer prevention. In pursuing its objectives, this research provided an integrated synthesis of the current evidence on the uptake, safety, and implications of salpingectomy, serving as an important reference point for clinical practice and future translational research.

Strengths and Limitations

This systematic review utilized a strong methodology by adhering to PRISMA guidelines to pool the latest global evidence on salpingectomy for 2020-2025. The major strength was the inclusion

of diverse study designs, global datasets, strong statistical tests, and utilization of visualizations such as choropleth and waffle plots for improved understanding.

Nonetheless, meta-analysis was constrained by the limited studies with extractable incidence data and observational study designs. Heterogeneity also resulted from reporting standards and follow-up periods, affecting comparability. Notwithstanding this, the review provides contemporary evidence on the role of salpingectomy in preventing ovarian cancer.

Declarations

Ethical Approval

Not Required since the study conducted was a systematic review and meta-analyses and included the studies selected from 2020-2025.

Source of Funding

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Conflicts of Interests

The authors report no conflict of interest.

Author Contributions

Conceptualization and methodology R.S., R.B., and J.C.; Formal analysis, S.N.; Visualization and writing -original draft S.N.; Writing -review and editing R.S., R.B., and J.C. All authors have read and agreed to the final version of the manuscript.

Article Category

Systematic review and meta-analysis

References

[1] Greene MH, Mai PL, Schwartz PE. Does bilateral salpingectomy with ovarian retention warrant consideration as a temporary bridge to risk-reducing bilateral oophorectomy in BRCA1/2 mutation carriers? American journal of obstetrics and gynecology. 2011 Jan 1;204(1):19-e1.

[2] Balsarkar G. Opportunistic salpingectomy as an ovarian cancer primary prevention strategy. The Journal of Obstetrics and Gynecology of India. 2017 Aug; 67:243-6.

[3] Schenberg T, Mitchell G. Prophylactic bilateral salpingectomy as a prevention strategy in women at high-risk of ovarian cancer: a mini-review. Frontiers in oncology. 2014 Feb 10;4:21.

[4] Gabai-Kapara E, Lahad A, Kaufman B, Friedman E, Segev S, Renbaum P, Beeri R, Gal M, Grinshpun-Cohen J, Djemal K, Mandell JB. Population-based screening for breast and ovarian cancer risk due to BRCA1 and BRCA2. Proceedings of the National Academy of Sciences. 2014 Sep 30;111(39):14205-10.

[5] Gasparri ML, Taghavi K, Fiacco E, Zuber V, Di Micco R, Gazzetta G, Valentini A, Mueller MD, Papadia A, Gentilini OD. Risk-reducing bilateral salpingo-oophorectomy for BRCA mutation carriers and hormonal replacement therapy: if it should rain, better a drizzle than a storm. Medicina. 2019 Jul 29;55(8):415.

[6] Hall E, Finch A, Jacobson M, Rosen B, Metcalfe K, Sun P, Narod SA, Kotsopoulos J. Effects of bilateral salpingo-oophorectomy on menopausal symptoms and sexual functioning among women with a BRCA1 or BRCA2 mutation. Gynecologic oncology. 2019 Jan 1;152(1):145-50.

[7] Wilczyński J, Paradowska E, Wilczyński M. High-grade serous ovarian cancer-A risk factor puzzle and screening fugitive. Biomedicines. 2024 Jan 19;12(1):229.

[8] Boerner T, Roche KL. Salpingectomy for the risk reduction of ovarian cancer: is it time for a salpingectomy-alone approach?. Journal of minimally invasive gynecology. 2021 Mar 1;28(3):403-8.

[9] Conduit C, Milne RL, Friedlander ML, Phillips KA. Bilateral salpingo-oophorectomy and breast cancer risk for BRCA1 and BRCA2 mutation carriers: assessing the evidence. Cancer Prevention Research. 2021 Nov 1;14(11):983-94.

[10] Gelderblom ME, Van Lieshout LA, Piek JM, De Hullu JA, Hermens RP. Patients' and professionals' perspectives on implementation of opportunistic salpingectomy: a mixed-method study. BMC Health Services Research. 2021 Dec; 21:1-4.

[11] Pölcher M, Hauptmann S, Fotopoulou C, et al. Should Fallopian Tubes Be Removed During Hysterectomy Procedures? - A Statement by AGO Ovar. Geburtshilfe Frauenheilkd. 2015;75(4):339-341. doi:10.1055/s-0035-1545958

[12] Hanley GE, Niu J, Han J, Fung S, Bryant H, Kwon JS, Huntsman DG, Finlayson SJ, McAlpine JN, Miller D, Earle CC. Opportunistic salpingectomy between 2011 and 2016: a descriptive analysis. Canadian Medical Association Open Access Journal. 2022 Apr 1;10(2):E466-75.

[13] Daly MB, Dresher CW, Yates MS, Jeter JM, Karlan BY, Alberts DS, Lu KH. Salpingectomy as a means to reduce ovarian cancer risk. Cancer Prevention Research. 2015 May 1;8(5):342-8.

[14] Gelderblom ME, Jaspers V, Akkermans RP, Slangen B, Oei AL, van Ginkel AA, Ngo H, IntHout J, Hermens RP, de Hullu JA, Piek JM. First step in implementation of opportunistic salpingectomy for prevention of ovarian cancer: Current care and its determinants. Acta obstetricia et gynecologica Scandinavica. 2023 Mar;102(3):257-69.

[15] Samimi G, Trabert B, Geczik AM, Duggan MA, Sherman ME. Population frequency of serous tubal intraepithelial carcinoma (STIC) in clinical practice using SEE-Fim protocol. JNCI Cancer Spectrum. 2018 Oct;2(4): pky061.

[16] Runnebaum IB, Kather A, Vorwergk J, Cruz JJ, Mothes AR, Beteta CR, Boer J, Keller M, Pölcher M, Mustea A, Sehouli J. Ovarian cancer prevention by opportunistic salpingectomy is a new de facto standard in Germany. Journal of Cancer Research and Clinical Oncology. 2023 Aug;149(10):6953-66.

[17] Giannakeas V, Murji A, Lipscombe LL, Narod SA, Kotsopoulos J. Salpingectomy and the risk of ovarian cancer in Ontario. JAMA Network Open. 2023 Aug 1;6(8):e2327198.

[18] Bacha OM, Gregoire J, Grondin K, Edelweiss MI, Laframboise R, Simard J, Plante M. Effectiveness of risk-reducing salpingo-oophorectomy in preventing ovarian cancer in a high-risk French Canadian population.

International Journal of Gynecological Cancer. 2012 Jul 1;22(6):974-8.

[19] Gootzen TA, Steenbeek MP, van Bommel MH, IntHout J, Kets CM, Hermens RP, de Hullu JA. Risk-reducing salpingectomy with delayed oophorectomy to prevent ovarian cancer in women with an increased inherited risk: insights into an alternative strategy. Familial Cancer. 2024 Nov;23(4):437-45.

[20] Harmsen MG, Arts-de Jong M, Hoogerbrugge N, Maas AH, Prins JB, Bulten J, Teerenstra S, Adang EM, Piek JM, van Doorn HC, van Beurden M. Early salpingectomy (TUbectomy) with delayed oophorectomy to improve quality of life as alternative for risk-reducing salpingo-oophorectomy in BRCA1/2 mutation carriers (TUBA study): a prospective non-randomised multicentre study. BMC cancer. 2015 Dec;15:1-9.

[21] Yen JC, Wu TI, Stone R, Wang TL, Visvanathan K, Chen LY, Hsu MH, Shih IM. Salpingectomy for ectopic pregnancy reduces ovarian cancer risk-a nationwide study. JNCI Cancer Spectrum. 2024 Jun 1;8(3): pkae027.

[22] Long Roche KC, Abu-Rustum NR, Nourmoussavi M, Zivanovic O. Risk-reducing salpingectomy: Let us be opportunistic. Cancer. 2017 May 15;123(10):1714-20.

[23] Strandell A, Magarakis L, Sundfeldt K, Pålsson M, Liv P, Idahl A. Salpingectomy versus tubal occlusion in laparoscopic sterilisation (SALSTER): a national register-based randomised non-inferiority trial. The Lancet Regional Health–Europe. 2024 Oct 1;45.

[24] Magarakis L, Idahl A, Sundfeldt K, Liv P, Pålsson M, Strandell A. SALpingectomy for STERilisation (SALSTER): study protocol for a Swedish multicentre register-based randomised controlled trial. BMJ open. 2023 Sep 1;13(9):e071246.

[25] Lukey A, Howard A, Mei AJ, Law MR, Huntsman D, Pearce CL, Meza R, Hanley GE. Risk-reducing salpingectomy: considerations from an OBGYN perspective. BMC cancer. 2025 Dec;25(1):1-8.

[26] Kamran MW, Vaughan D, Crosby D, Wahab NA, Saadeh FA, Gleeson N. Opportunistic and interventional salpingectomy in women at risk: a strategy for preventing pelvic serous cancer (PSC). European Journal of Obstetrics & Gynecology and Reproductive Biology. 2013 Sep 1;170(1):251-4.