Original Article
http://mjiri.iums.ac.ir
Medical Journal of the Islamic Republic of Iran (MJIRI)

Med J Islam Repub Iran. 2025 (3 Jun);39.76. https://doi.org/10.47176/mjiri.39.76

Global Trends in Urological Evidence Synthesis: A Bibliometric Analysis of Systematic Reviews and Meta-analyses

Mohammad Amin Salari[1#], Sina Baghi Keshtan[2#], Ghazal Mohammadi[3], Ali Faryabi[3], Hossein Aazami[4], Hojat Dehghanbanadaki[3*]

Received: 24 Jan 2025 Published: 3 Jun 2025

Abstract

Background: Systematic reviews and meta-analyses are essential for evidence-based urology practice. Despite their importance, no comprehensive assessment of their evolution exists, limiting understanding of research priorities. This bibliometric analysis examines systematic reviews and meta-analyses in urology, analyzing publication trends, influential works, and collaboration networks to guide future research.

Methods: In this bibliometric study, a comprehensive search of the Scopus database was conducted until January 2024, focusing on English-language systematic reviews and meta-analyses in urology. Bibliometric data were analyzed using Excel, VOSviewer, and Scimago Graphica to examine publication trends, citations, collaborations, and research themes.

Results: Analysis of 9006 publications (55.4% open access) showed exponential growth from 1987 (n = 1) to 2024 (n = 1025). The top 50 cited papers focused mainly on urological oncology (uro-oncology), surgical outcomes, and diagnostic imaging. European Urology emerged as the leading journal, showing strong bibliographic coupling with other specialty urological journals. Term co-occurrence analysis revealed 5 major clusters: (1) drug efficacy in prostatic hyperplasia; (2) cancer risk and genetic studies; (3) treatment modalities in urological cancers; (4) surgical complications; and (5) diagnostic accuracy in prostate cancer. The United States, Italy, and the United Kingdom demonstrated the strongest international collaboration networks, with European countries showing robust research partnerships.

Conclusion: Urological evidence synthesis shows particular emphasis on uro-oncology, surgical outcomes, and diagnostic imaging, reflecting the evolution of evidence-based urological practice. Future research should focus on expanding international collaborations, addressing emerging diagnostic technologies, and developing standardized methodologies for evidence synthesis in urological practice.

Keywords: Systematic Review, Meta-analysis, Bibliometric, Scientometric, Trend, Urology, Evidence Synthesis

Conflicts of Interest: *None declared*
Funding: *None*

Cite this article as: Salari MA, Baghi Keshtan S, Mohammadi G, Faryabi A, Aazami H, Dehghanbanadaki H. Global Trends in Urological Evidence Synthesis: A Bibliometric Analysis of Systematic Reviews and Meta-analyses. *Med J Islam Repub Iran.* 2025 (3 Jun);39:76. https://doi.org/10.47176/mjiri.39.76

Corresponding author: *Dr Hojat Dehghanbanadaki, dehghan.hojat@yahoo.com*

 # Contributed equally

1. Shahrekord Branch, Islamic Azad University, Shahrekord, Iran
2. Birjand University of Medical Sciences, Birjand, Iran
3. Tehran University of Medical Sciences, Tehran, Iran
4. Iran University of Medical Sciences, Tehran, Iran

↑What is "already known" in this topic:
While systematic reviews and meta-analyses serve as cornerstone methodologies in evidence-based urological practice, a comprehensive bibliometric analysis of publication trends, citation patterns, and thematic evolution in this field has not been previously conducted.

→What this article adds:
This bibliometric analysis presents the first comprehensive mapping of evidence synthesis in urology, revealing distinct research clusters centered on therapeutic efficacy, oncological outcomes, and diagnostic accuracy. Through an analysis of highly cited papers and term co-occurrence patterns, it identifies the predominance of urological oncology research, particularly in the management of prostate and bladder cancer, surgical interventions, and emerging diagnostic technologies. The study also demonstrates the field's methodological maturation through increasingly sophisticated analytical approaches and expanding research scope.

[DOI: 10.47176/mjiri.39.76]

Introduction

Systematic reviews employ methodological rigor to synthesize and critically evaluate research evidence, implementing standardized protocols that enhance transparency and minimize bias. These comprehensive analyses enable researchers to reconcile divergent findings across studies while identifying crucial knowledge gaps in the literature. When methodologically appropriate, meta-analyses extend these reviews by providing statistical frameworks to aggregate and quantify findings across multiple studies, yielding more precise estimates of intervention effects (1, 2). In the field of urology, these evidence synthesis methodologies have become increasingly important for informing clinical decision-making, developing practice guidelines, and directing future research priorities.

The growth of urological research publications has created both opportunities and challenges for clinicians and researchers seeking to implement evidence-based practices. While the volume of primary studies continues to expand, the ability to efficiently identify, evaluate, and integrate this evidence remains limited without proper synthesis tools. Systematic reviews and meta-analyses have thus emerged as critical navigational instruments in this complex information landscape, helping to establish consensus where conflicting evidence exists and highlighting areas requiring further investigation.

The evolution and impact of scientific literature can be systematically examined through bibliometric analysis, a quantitative approach that examines various dimensions of scholarly communication. This analytical framework investigates citation relationships, publication patterns, and collaborative networks, providing valuable insights into knowledge dissemination and the growth of scientific understanding across research domains (3). Despite the proliferation of systematic reviews and meta-analyses in urology, there has been no comprehensive bibliometric assessment of these publications to identify influential works, collaboration patterns, and evolving research priorities within the field.

In urological research, where systematic reviews and meta-analyses guide clinical practice and policy decisions, understanding the landscape of evidence synthesis becomes paramount. This knowledge gap limits our understanding of how evidence synthesis has shaped the field and which areas may be underrepresented in the current literature. Our comprehensive bibliometric investigation examines the characteristics and trends of systematic reviews and meta-analyses in urology, including a detailed analysis of the 50 most-cited papers in this domain. By examining temporal trends, authorship patterns, citation networks, and international collaboration structures, this study aims to map the intellectual evolution of evidence synthesis in urology, identify influential research clusters, and highlight potential gaps in the current evidence base. This analysis provides insights into both the historical development and contemporary state of evidence-based urological practice. This analysis is essential for recognizing historical contributions, understanding current research priorities, and guiding future evidence synthesis efforts in urology. Furthermore, identifying highly influential reviews can help clinicians and researchers prioritize key evidence sources while revealing underrepresented topics that warrant greater attention.

Methods

A comprehensive bibliometric analysis was conducted using data extracted from the Scopus database on January 10, 2025. The selection of Scopus was based on its extensive indexing of academic publications, robust citation analysis capabilities, and comprehensive metadata availability for bibliometric research (4).

A systematic search strategy was developed by combining relevant MeSH terms and keywords pertaining to systematic reviews, meta-analyses, and urological conditions. The complete search strategy is provided in Appendix. The search was conducted to collect all related documents about urology from the database's inception up to the end of 2024.

Inclusion criteria were: English language publications, systematic review or meta-analysis methodology, and published up to the end of 2024. Exclusion criteria included: non-English publications, and publications other than systematic reviews and meta-analyses (such as narrative reviews, etc).

Bibliometric data were extracted from Scopus, including key indicators such as publication metadata (titles, abstracts, and publication years), author information and affiliations, source journals, citations, author keywords, and geographic data. This dataset was exported in CSV format and subsequently processed using Microsoft Excel for initial analysis. Publication counts and citation data were analyzed to quantify annual publication trends, citation patterns, institutional contributions, country-level productivity, and journal impact. Authors, countries, and journals were ranked according to their publication output (number and percentage of total publications). Highly-cited articles were ranked based on their total citation counts.

For visualization of bibliometric networks and relationships, we employed 2 specialized tools. Scimago Graphica was used to create visual representations of publication trends and global distribution patterns. Additionally, VOSviewer (Version 1.6.20) was applied to generate sophisticated network analyses, including keyword co-occurrence maps, author collaboration networks, journal citation relationships, and country cooperation visualizations. These visualizations enabled the identification of key research clusters and collaboration patterns.

Results

General Overview of Publication in Urological Evidence Synthesis

In this bibliometric analysis, a total of 10,038 records were initially retrieved, resulting in the selection of 9006 relevant publications after applying the exclusion criteria. Of these, 4994 (55.4%) were available as open access.

[DOI: 10.47176/mjiri.39.76]

Annual Publication Trends in Urological Evidence Synthesis

Examination of publication patterns for systematic reviews and meta-analyses in urology demonstrates a remarkable evolution over nearly 4 decades. The field's inception can be traced to 1987 with a single publication, followed by minimal activity in the early 1990s with only 2 to 5 publications annually (Figure 1). A gradual increase began in the late 1990s, with publications reaching double digits for the first time in 1998 (11 papers). The year 2000 marked a significant shift with 25 publications, initiating a period of steady growth. The field experienced its first major expansion in the mid-2000s, with publications more than doubling from 46 in 2005 to 112 in 2009. A second substantial surge occurred in 2012 with 255 publications, nearly double the previous year's output. The most dramatic growth phase began in 2020, with annual publications increasing from 754 to 1025 in 2024 (Figure 1).

Top-cited Urological Evidence Synthesis and Their Leading Journals, Authors, and Themes

In this bibliometric analysis of the 50 most-cited systematic reviews and meta-analyses in urology, citation patterns range from 442 to 2,837 citations (Table 1). The most cited paper by Guh et al (2009) in BMC Public Health, with 2837 citations, reported the incidence of various comorbidities in obesity and depicted no increased risk for prostate cancer in obese people. Steinmann et al's work (2006) in Lancet Infectious Diseases (1673 citations) investigated the risk of urinary schistosomiasis in water resources, demonstrating a 2.4 times increased risk among people living adjacent to dam reservoirs and the risk ratio of 1.1 (range, 0.02-7.3) among people living in irrigation schemes. Renehan et al's study (2004) in The Lancet (1,498 citations) established the association of IGF-I with increased prostate cancer risk (odds ratio [OR], 1.49), demonstrating the potential role of the IGF pathway in prostate carcinogenesis. Additional details on the remaining highly cited studies are summarized in Table 1.

Journal analysis shows European Urology published 21 papers (42%) from the top 50, followed by the Journal of Urology published 5 papers (10%).

Among the authors, Ficarra V appears as first author on 2 papers (990 and 843 citations) focusing on robotic prostatectomy outcomes. Perera M contributed 2 papers (816 and 657 citations) on PSMA PET imaging in prostate cancer. Vale C published an original systematic review on neoadjuvant chemotherapy in invasive bladder cancer (613 citations) and its subsequent update (1038 citations).

Thematically, these highly cited papers encompass a diverse subset of topics from Table 1, including uro-oncology (particularly bladder and prostate cancer management), surgical outcomes (comparing robotic, laparoscopic, and open approaches), diagnostic imaging, and metabolic aspects of urological conditions. The temporal distribution indicates 28 papers (56%) were published between 2009 and 2015.

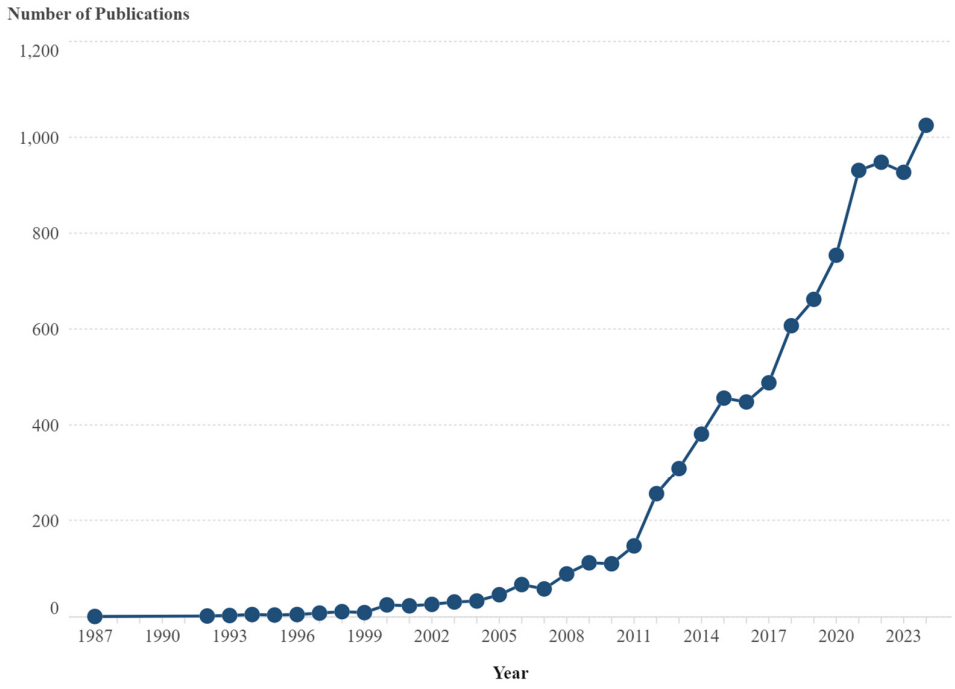

Figure 1. Annual Trends in Published Studies in Urological Evidence Synthesis
The figure illustrates the yearly progression of publications related to urological evidence synthesis, highlighting notable growth in recent decades.

[DOI: 10.47176/mjiri.39.76]

Table 1. Top 50 Most-Cited Studies in Urological Systematic Reviews and Meta-Analyses

#	Authors	Title	Journal	Year	Number of Citations	Urological Aspect
1	Guh D.P et al	The incidence of co-morbidities related to obesity and overweight: A systematic review and meta-analysis	BMC Public Health	2009	2837	Quantification of comorbidity risks in obesity, including urological cancers (prostate cancer showed no increased risk) and impact on overall urological health; strongest association was with Type 2 Diabetes
2	Steinmann P et al	Schistosomiasis and water resources development: systematic review, meta-analysis, and estimates of people at risk	Lancet Infectious Diseases	2006	1673	The risk ratio of 2.4 for urinary schistosomiasis among people living adjacent to dam reservoirs and the risk ratio of 1.1 (range: 0.02-7.3) for urinary schistosomiasis among people living in irrigation schemes
3	Renehan A.G et al	Insulin-like growth factor (IGF)-I, IGF binding protein-3, and cancer risk: Systematic review and meta-regression analysis	Lancet	2004	1498	Association of IGF-I with increased prostate cancer risk (OR=1.49), demonstrating potential role of IGF pathway in prostate carcinogenesis
4	Sylvester R.J et el	Intravesical bacillus Calmette-Guerin reduces the risk of progression in patients with superficial bladder cancer: A meta-analysis of the published results of randomized clinical trials	Journal of Urology	2002	1096	BCG maintenance therapy reduces progression risk by 27% in superficial bladder cancer; established as optimal agent for intermediate/high-risk NMIBC
5	Vale C.L	Neoadjuvant chemotherapy in invasive bladder cancer: Update of a systematic review and meta-analysis of individual patient data	European Urology	2005	1038	5% absolute survival benefit at 5 years with platinum-based neoadjuvant chemotherapy in invasive bladder cancer (HR=0.86)
6	Ficarra V et al	Systematic review and meta-analysis of studies reporting urinary continence recovery after robot-assisted radical prostatectomy	European Urology	2012	990	Superior 12-month continence recovery with RARP vs RRP/LRP (OR: 1.53/2.39); age/BMI/comorbidities are key predictors
7	Esposito K et al	Metabolic syndrome and risk of cancer: A systematic review and meta-analysis	Diabetes Care	2012	922	Metabolic syndrome associated with increased bladder cancer risk in men (RR=1.10), with differential cancer risks between sexes
8	Bagnardi V et al	Alcohol consumption and site-specific cancer risk: A comprehensive dose-response meta-analysis	British Journal of Cancer	2015	912	Comprehensive analysis of alcohol's impact on multiple cancers including prostate cancer, showing potential positive association
9	Ficarra V et al	Retropubic, Laparoscopic, and Robot-Assisted Radical Prostatectomy: A Systematic Review and Cumulative Analysis of Comparative Studies	European Urology	2009	843	Comparative outcomes of surgical approaches for prostatectomy; LRP/RALP show lower blood loss but similar functional/oncologic outcomes
10	Perera M et al	Sensitivity, Specificity, and Predictors of Positive 68Ga–Prostate-specific Membrane Antigen Positron Emission Tomography in Advanced Prostate Cancer: A Systematic Review and Meta-analysis	European Urology	2016	816	High diagnostic accuracy of 68Ga-PSMA PET (sensitivity/specificity 86%) for detecting prostate cancer recurrence, PSA-dependent detection rates
11	Hanna T.P et al	Mortality due to cancer treatment delay: systematic review and meta-analysis	BMJ (Clinical research ed.)	2020	812	Impact of treatment delays on cancer mortality, including urological cancers; 4-week delay associated with 6-8% increased mortality risk
12	Zhang Q et al	Prognostic Significance of Tumor-Associated Macrophages in Solid Tumor: A Meta-Analysis of the Literature	PLoS ONE	2012	805	TAM density correlation with bladder cancer staging (RR=3.30) and poor survival outcomes (RR=5.00)
13	Loeb S et al	Systematic review of complications of prostate biopsy	European Urology	2013	799	Comprehensive analysis of prostate biopsy complications; rising infection rates despite prophylaxis, rare serious complications

[DOI: 10.47176/mjiri.39.76]

Table 1. Top 50 Most-Cited Studies in Urological Systematic Reviews and Meta-Analyses

#	Authors	Title	Journal	Year	Number of Citations	Urological Aspect
14	DeCensi A et al	Metformin and cancer risk in diabetic patients: A systematic review and meta-analysis	Cancer Prevention Research	2010	787	Evaluation of metformin's effect on prostate cancer risk showed nonsignificant association, suggesting limited protective effect on urological cancers.
15	Vasilakou D et al	Sodium-glucose cotransporter 2 inhibitors for type 2 diabetes: A systematic review and meta-analysis	Annals of Internal Medicine	2013	786	Safety profile analysis including urological complications - increased UTI risk (OR=1.42) with SGLT2 inhibitors
16	Hövels A.M	The diagnostic accuracy of CT and MRI in the staging of pelvic lymph nodes in patients with prostate cancer: a meta-analysis	Clinical Radiology	2008	766	Poor performance of both CT/MRI in detecting prostate cancer lymph node metastases (sensitivity ~0.40)
17	Fütterer J.J et al	Can Clinically Significant Prostate Cancer Be Detected with Multiparametric Magnetic Resonance Imaging? A Systematic Review of the Literature	European Urology	2015	667	High detection rate (44-87%) and negative predictive value (63-98%) of mpMRI for clinically significant prostate cancer
18	Chapple C.R et al	The Effects of Antimuscarinic Treatments in Overactive Bladder: An Update of a Systematic Review and Meta-Analysis	European Urology	2008	665	Comprehensive analysis of antimuscarinic efficacy in overactive bladder; significant improvements in continence with acceptable safety profile
19	Calof O.M et al	Adverse events associated with testosterone replacement in middle-aged and older men: A meta-analysis of randomized, placebo-controlled trials	Journals of Gerontology - Series A Biological Sciences and Medical Sciences	2005	657	Increased prostate events (OR=1.78) and hematocrit elevation with testosterone replacement; necessity of PSA monitoring
20	Perera M et al	Gallium-68 Prostate-specific Membrane Antigen Positron Emission Tomography in Advanced Prostate Cancer—Updated Diagnostic Utility, Sensitivity, Specificity, and Distribution of Prostate-specific Membrane Antigen-avid Lesions: A Systematic Review and Meta-analysis	European Urology	2020	657	PSA-dependent detection rates of 68Ga-PSMA PET; high sensitivity in biochemical recurrence even at low PSA levels
21	De Boer A et al	Cancer survivors and unemployment a meta-analysis and meta-regression	JAMA	2009	656	Prostate cancer survivors demonstrate similar unemployment rates compared to healthy controls (39.4% vs 27.1%; RR 1.11), suggesting minimal impact of prostate cancer on employment status compared to other cancer types.
22	Sylvester R.J et al	A single immediate postoperative instillation of chemotherapy decreases the risk of recurrence in patients with stage Ta T1 bladder cancer: A meta-analysis of published results of randomized clinical trials	Journal of Urology	2004	637	Immediate single instillation of chemotherapy reduces recurrence risk by 39% in Ta T1 bladder cancer (OR=0.61)
23	Kirby M et al	Characterising the castration-resistant prostate cancer population: A systematic review	International Journal of Clinical Practice	2011	634	CRPC epidemiology shows 10-20% progression within 5 years; 84% have metastases at diagnosis with median survival of 14 months
24	Chawla S.N et al	The natural history of observed enhancing renal masses: Meta-analysis and review of the world literature	Journal of Urology	2006	628	Small renal masses show slow growth rate (0.28 cm/year) with only 1% progression to metastasis during observation
25	Vale C	Neoadjuvant chemotherapy in invasive bladder cancer: A systematic review and meta-analysis	Lancet	2003	613	Platinum-based neoadjuvant chemotherapy provides 5% absolute survival benefit at 5 years (HR 0.87)
26	Tewari A.K et al	Systematic review and meta-analysis of studies reporting potency rates after robot-assisted radical prostatectomy	European Urology	2012	613	Robot-assisted prostatectomy shows superior 12-month potency rates vs open surgery (OR 2.84)

[DOI: 10.47176/mjiri.39.76]

Table 1. Top 50 Most-Cited Studies in Urological Systematic Reviews and Meta-Analyses

#	Authors	Title	Journal	Year	Number of Citations	Urological Aspect
27	Cumberbatch M.G.K et al	Epidemiology of Bladder Cancer: A Systematic Review and Contemporary Update of Risk Factors in 2018	European Urology	2018	589	Tobacco smoking and occupational exposure remain the leading risk factors for bladder cancer, with emerging insights into gene-environment interactions.
28	Schoots I.G et al	Magnetic Resonance Imaging-targeted Biopsy May Enhance the Diagnostic Accuracy of Significant Prostate Cancer Detection Compared to Standard Transrectal Ultrasound-guided Biopsy: A Systematic Review and Meta-analysis	European Urology	2015	581	MRI-targeted biopsy shows higher detection rate of significant prostate cancer vs standard TRUS biopsy (sensitivity 0.91 vs 0.76)
29	Rhodes D.R et al	Meta-analysis of microarrays: Interstudy validation of gene expression profiles reveals pathway dysregulation in prostate cancer	Cancer Research	2002	577	Cross-validation of prostate cancer expression profiles revealing dysregulation in polyamine and purine biosynthesis pathways
30	Mctiernan A et al	Physical Activity in Cancer Prevention and Survival: A Systematic Review	Medicine and Science in Sports and Exercise	2019	569	Physical activity linked to reduced risk and improved survival in prostate cancer, with up to 40%-50% lower mortality rates
31	Cunningham C et al	Consequences of physical inactivity in older adults: A systematic review of reviews and meta-analyses	Scandinavian Journal of Medicine and Science in Sports	2020	559	Physical inactivity in older adults linked to increased risk of prostate cancer, functional limitations, and poorer quality of life
32	Keag O.E et al	Long-term risks and benefits associated with cesarean delivery for mother, baby, and subsequent pregnancies: Systematic review and meta-analysis	PLoS Medicine	2018	551	Cesarean delivery reduces urinary incontinence (OR=0.56)
33	García-Closas M et al	NAT2 slow acetylation, GSTM1 null genotype, and risk of bladder cancer: Results from the Spanish Bladder Cancer Study and meta-analyses	Lancet	2005	538	NAT2 slow acetylation and GSTM1 null genotype increase bladder cancer risk, particularly in smokers, accounting for up to 31% of cases
34	Malmström P.U et al	An Individual Patient Data Meta-Analysis of the Long-Term Outcome of Randomised Studies Comparing Intravesical Mitomycin C versus Bacillus Calmette-Guérin for Non-Muscle-Invasive Bladder Cancer	European Urology	2009	528	BCG maintenance superior to MMC for recurrence prevention but no difference in progression and survival outcomes
35	Ahyai S.A et al	Meta-analysis of functional outcomes and complications following transurethral procedures for lower urinary tract symptoms resulting from benign prostatic enlargement	European Urology	2010	512	Comparable efficacy and overall morbidity between minimally invasive surgical therapies and TURP for BPE
36	Hackshaw A et al	Maternal smoking in pregnancy and birth defects: A systematic review based on 173 687 malformed cases and 11.7 million controls	Human Reproduction Update	2011	505	Maternal smoking significantly associated with multiple birth defects, including undescended testes (OR=1.13) and reduced risk of hypospadias (OR=0.90)
37	Bagnardi V et al	A meta-analysis of alcohol drinking and cancer risk	British Journal of Cancer	2001	497	Analysis of alcohol consumption showed no significant nor consistent relationship with prostate and bladder cancers, indicating minimal impact on urological cancer risk.
38	Dall'Era M.A et al	Active surveillance for prostate cancer: A systematic review of the literature	European Urology	2012	496	Low disease-specific mortality (0-1%) with active surveillance; one-third require treatment after median 2.5 years
39	Böhle A et al	Intravesical bacillus Calmette-Guerin versus mitomycin C for superficial bladder cancer: A formal meta-analysis of comparative studies on recurrence and toxicity	Journal of Urology	2003	494	BCG maintenance superior to MMC for tumor recurrence prevention (OR 0.56) despite higher toxicity

[DOI: 10.47176/mjiri.39.76]

Table 1. Top 50 Most-Cited Studies in Urological Systematic Reviews and Meta-Analyses

#	Authors	Title	Journal	Year	Number of Citations	Urological Aspect
40	Akl E.A et al	The effects of waterpipe tobacco smoking on health outcomes: A systematic review	International Journal of Epidemiology	2010	491	Waterpipe smoking linked to infertility (OR 2.5) and low birth weight (OR 2.12); further studies needed on urological impacts.
41	de Rooij M et al	Accuracy of Magnetic Resonance Imaging for Local Staging of Prostate Cancer: A Diagnostic Meta-analysis	European Urology	2016	486	MRI shows high specificity (88-96%) but poor sensitivity (57-61%) for local prostate cancer staging; functional imaging and 3T strength improve detection accuracy
42	Sermondade N et al	BMI in relation to sperm count: An updated systematic review and collaborative meta-analysis	Human Reproduction Update	2013	482	J-shaped relationship between BMI and male infertility; morbid obesity associated with 2-fold increased risk of oligozoospermia/azoospermia
43	Schwingshackl L et al	Adherence to mediterranean diet and risk of cancer: An updated systematic review and meta-analysis	Nutrients	2017	479	Small protective effect observed for prostate cancer (RR=0.96, 95% CI 0.92-1.00) with adherence to Mediterranean diet, suggesting modest risk reduction.
44	Wilt T.J et al	Systematic review: Comparative effectiveness and harms of treatments for clinically localized prostate cancer	Annals of Internal Medicine	2008	473	Radical prostatectomy shows survival benefit vs watchful waiting in men <65 years; limited comparative effectiveness data between different treatment modalities
45	Moore C.M et al	Image-guided prostate biopsy using magnetic resonance imaging-derived targets: A systematic review	European Urology	2013	462	MRI-targeted biopsy detects prostate cancer as effectively as standard biopsy with fewer cores (3.8 vs 12) and lower rates of clinically insignificant cancer
46	Van Rhijn B.W.G et al	Urine markers for bladder cancer surveillance: A systematic review	European Urology	2005	458	Evaluation of 18 urinary biomarkers for bladder cancer surveillance; microsatellite analysis, ImmunoCyt, and FISH show promise but cannot replace cystoscopy
47	Tewari A et al	Positive surgical margin and perioperative complication rates of primary surgical treatments for prostate cancer: A systematic review and meta-analysis comparing retropubic, laparoscopic, and robotic prostatectomy	European Urology	2012	449	Robot-assisted prostatectomy shows advantages over open/laparoscopic approaches in perioperative complications and equivalent positive margin rates
48	Isidori A.M et al	Effects of testosterone on sexual function in men: Results of a meta-analysis	Clinical Endocrinology	2005	447	Testosterone treatment moderately improves sexual function in hypogonadal men (T<12 nmol/L) but shows no benefit in eugonadal men
49	MacLean C.H et al	Effects of omega-3 fatty acids on cancer risk: A systematic review	JAMA	2006	442	Examination of prostate cancer risk showed mixed results (RR 0.43 for decreased risk vs RR 1.98 for increased advanced cancer risk) with most studies showing no association; no significant relationship found with bladder cancer incidence.
50	Kunkle D.A et al	Excise, Ablate or Observe: The Small Renal Mass Dilemma-A Meta-Analysis and Review	Journal of Urology	2008	440	In comparison to nephron sparing surgery, both cryoablation (RR = 7.45) and radio frequency ablation (RR = 18.23) showed significantly higher local progression rates. However, no significant differences were found in metastatic progression rates, regardless of whether the lesions were surgically excised, ablated, or monitored through observation.

[DOI: 10.47176/mjiri.39.76]

Table 2. Top 20 Authors, Journals and Countries in Urological Evidence Synthesis

#	Author	NP* (%)	Journal	NP (%)	Country	NP (%)
1	Shariat S.F	135 (1.49)	European Urology	266 (2.95)	China	2699 (29.96)
2	Somani B.K	77 (0.85)	Medicine (United States)	223 (2.47)	United States	2002 (22.22)
3	Pradere B	71 (0.78)	Plos One	207 (2.29)	United Kingdom	1349 (14.97)
4	Laukhtina E	64 (0.71)	Journal of Urology	187 (2.07)	Italy	1055 (11.71)
5	Mori K	63 (0.69)	BJU International	147 (1.63)	Canada	671 (7.45)
6	Cui Y	54 (0.59)	World Journal of Urology	142 (1.57)	Germany	559 (6.20)
7	Yang L	51 (0.56)	European Urology Focus	129 (1.43)	Netherlands	516 (5.72)
8	Briganti A	49 (0.54)	Prostate Cancer and Prostatic Diseases	125 (1.38)	Australia	501 (5.56)
9	Karakiewicz P.I	48 (0.53)	Frontiers in Oncology	118 (1.31)	France	464 (5.15)
10	Rajwa P	48 (0.53)	International Urogynecology Journal	118 (1.31)	Spain	413 (4.58)
11	Teoh J.Y.C	47 (0.52)	Urology	116 (1.28)	Iran	338 (3.75)
12	Ploussard G	46 (0.51)	Neurourology And Urodynamics	107 (1.18)	Switzerland	325 (3.60)
13	Quhal F	45 (0.49)	Cancers	98 (10.08)	Austria	305 (3.38)
14	Mostafaei H	41 (0.45)	Urologia Internationalis	89 (0.98)	Brazil	301 (3.34)
15	Zhang Y	40 (0.44)	Journal of Sexual Medicine	86 (0.95)	Belgium	258 (2.86)
16	Moschini M	39 (0.43)	European Urology Oncology	82 (0.91)	South Korea	228 (2.53)
17	Wei Q	39 (0.43)	BMJ Open	76 (0.84)	Greece	213 (2.36)
18	Montorsi F	37 (0.41)	Urologic Oncology Seminars and Original Investigations	76 (0.84)	India	203 (2.25)
19	Russo G.I	37 (0.41)	Oncotarget	75 (0.83)	Japan	183 (2.03)
20	Abufaraj M	36 (0.39)	BMC Urology	74 (0.82)	Sweden	166 (1.84)

NP: Number of Publications

Influential Authors and Collaboration Network Analysis in Urological Evidence Synthesis

The analysis of authorship patterns reveals significant contributions from key researchers in the field. Shariat emerges as the most prolific author with 135 publications, accounting for 1.49% of total publications. Somani follows with 77 publications, while Pradere contributes 71 publications. The complete list of top contributing authors and their publication metrics is presented in Table 2.

The co-authorship network analysis, examining authors with a minimum threshold of 20 publications, identified 84 researchers from an initial pool of 39,924 authors. Of these, 66 authors form the largest interconnected network component, indicating substantial collaboration within this core group of researchers. The analysis revealed strong collaborative relationships, with the network demonstrating robust interconnections among leading researchers (Figure 2).

Within this collaborative network, Shariat demonstrates the strongest collaborative ties, with a total link strength of 683, significantly higher than other researchers. Pradere and Laukhtina also show robust collaborative patterns, with link strengths of 501 and 499, respectively. The network reveals a strong research cluster centered around these leading authors, with Mori (total link strength: 449) and Quhal (total link strength: 374) completing the top 5 most collaborative researchers.

A notable pattern emerges in the clustering analysis of the most collaborative authors. Of the top 10 researchers with the highest total link strength, 9 authors are concentrated in the blue cluster, underscoring a cohesive research group. In contrast, Moschini (total link strength: 232) stands out as the sole representative of the purple cluster, reflecting a distinct but interconnected research network.

Influential Journals and Bibliographic Network Analysis in Urological Evidence Synthesis

The analysis of publication patterns reveals that European Urology stands as the leading journal in urological systematic reviews and meta-analyses, publishing 266 articles (2.95% of total publications). Medicine (United States) follows with 223 publications (2.47%), while PLOS One contributes 207 publications (2.29%). The complete distribution of top-contributing journals and their respective publication counts is presented in Table 2.

The bibliographic coupling analysis, examining journals with a minimum threshold of 20 documents, identified 87 journals from an initial pool of 1610 sources. The analysis revealed complex interconnections within the literature, with PLOS One demonstrating the strongest bibliographic coupling (total link strength: 105,796) based on its 207 documents generating 9572 citations. Medicine (United States) follows with a total link strength of 83,812, while European Urology shows robust coupling with 81,374 total link strength and the highest citation count of 46,647 (Table 3).

The bibliographic coupling network analysis identified 4 distinct clusters (Figure 3A), with the most influential journals primarily distributed between clusters 1 and 2. Cluster 1 encompasses specialty urological journals, with European Urology, Prostate Cancer and Prostatic Diseases, BJU International, and World Journal of Urology as key representatives. Cluster 2 includes broader scope journals such as PLOS One, Medicine (United States), Scientific Reports, Tumor Biology, and Oncotarget (Green cluster). Notable relationships emerge between journals with similar scope and focus across these clusters. For instance, PLOS One and Scientific Reports demonstrate particularly strong bibliographic coupling, indicating substantial overlap in their reference patterns. Similarly, European Urology, BJU International, and the Journal of Robotic Surgery show close bibliographic relationships, reflecting their shared focus on urological research (Figure 3 B).

[DOI: 10.47176/mjiri.39.76]

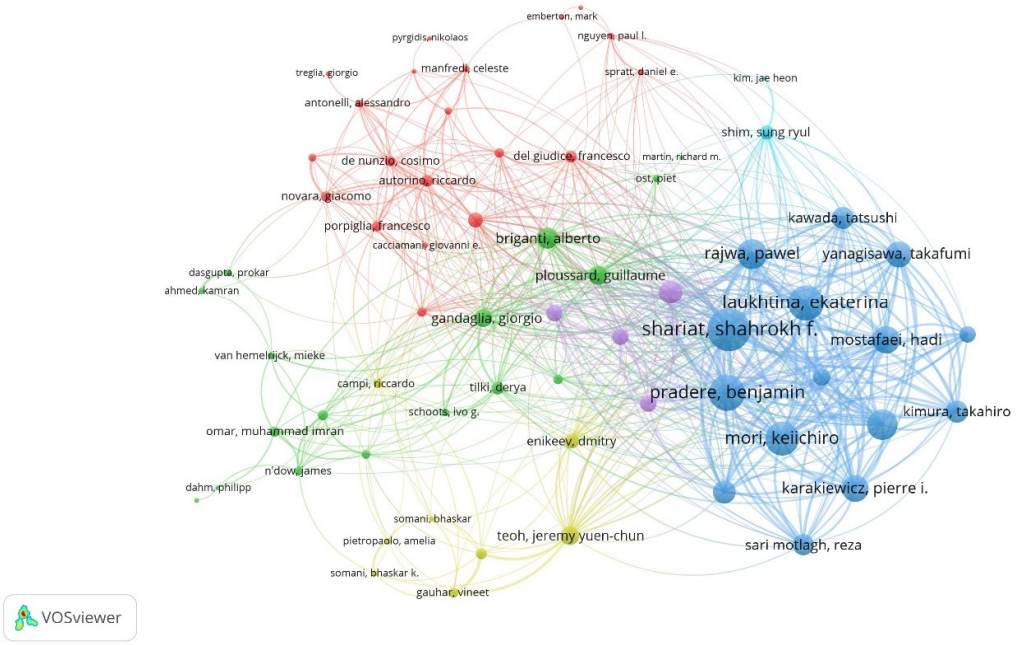

Figure 2. Co-Authorship Network in Urological Evidence Synthesis
This network illustrates the collaboration patterns among 66 researchers, each with at least 20 publications. Node sizes correspond to individual authors' total link strength, while edge thickness reflects the intensity of their collaborative connections. Shariat S.F. stands out with the highest link strength (683), followed by Pradere B. (n=501) and Laukhtina E. (n=499). The network reveals distinct collaboration clusters, with a strong concentration of key authors in the blue cluster, showcasing a cohesive and influential research group.

Table 3. The Top 10 Journals with the Strongest Bibliographic Coupling Relations in Urological Evidence Synthesis

#	Journal	Cluster	Total link strength	Documents	Citations
1	Plos One	2	105796	207	9572
2	Medicine (United States)	2	83812	223	2562
3	European Urology	1	81374	266	46647
4	Prostate Cancer and Prostatic Diseases	1	61748	125	3254
5	BJU International	1	51384	147	7100
6	World Journal of Urology	1	46909	142	2910
7	Scientific Reports	2	44677	67	2421
8	European Urology Focus	1	44393	129	3269
9	Tumor Biology	2	43590	52	886
10	Oncotarget	2	43382	75	2383

Top Countries, Geographic Distribution, and International Collaboration Patterns in Urological Evidence Synthesis

Analysis of publication patterns reveals China as the predominant contributor in urological systematic reviews and meta-analyses, producing 2699 publications (29.96% of total output). The United States follows as the second most productive country with 2002 publications (22.22%), while the United Kingdom maintains a strong presence with 1349 publications (14.97%). These 3 countries collectively account for over two-thirds of the global research output in this field (Table 2).

The geographical distribution demonstrates distinct regional patterns in research productivity (Figure 4). Western Europe shows substantial engagement, with Italy (1055 publications, 11.71%), Germany (559 publications, 6.20%), the Netherlands (516 publications, 5.72%), France (464 publications, 5.15%), and Spain (413 publications, 4.58%), all featuring among the top contributors. North America maintains a robust presence through both the United States and Canada (671 publications, 7.45%). The Asia-Pacific region's significance is primarily driven by China's contributions, complemented by Australia's notable output (501 publications, 5.56%).

International collaboration analysis, examining countries with a minimum threshold of 20 publications, identified 52 nations actively participating in collaborative research networks. The analysis revealed 4 distinct collaboration clusters, with a total link strength of 19812, indicating substantial international cooperation in urological evidence synthesis (Figure 5).

[DOI: 10.47176/mjiri.39.76]

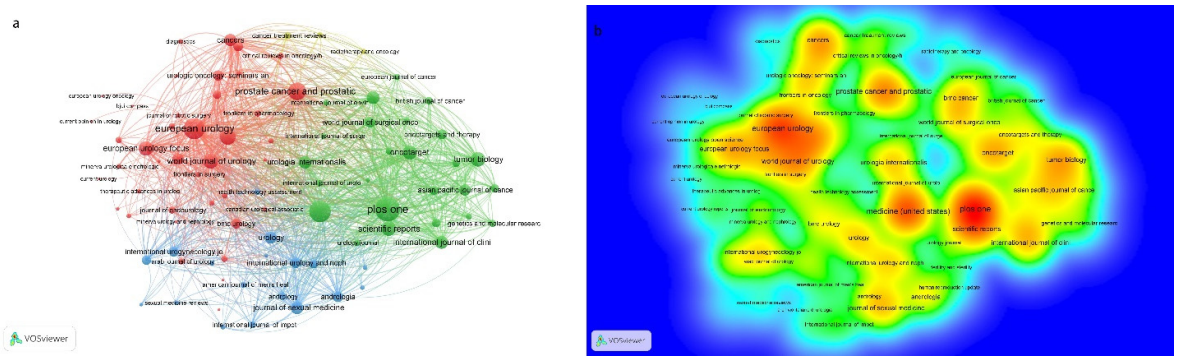

Figure 3. Bibliographic Coupling in Urological Evidence Synthesis
(a) Cluster Visualization: Four clusters are identified, with key journals in Cluster 1 (e.g. European Urology, BJU International) and Cluster 2 (e.g. PLOS One, Scientific Reports), reflecting thematic overlaps.
(b) Rainbow Density Map: Warmer colors indicate stronger bibliographic coupling. Notable relationships include strong links between PLOS One and Scientific Reports and among European Urology, BJU International, and the Journal of Robotic Surgery.

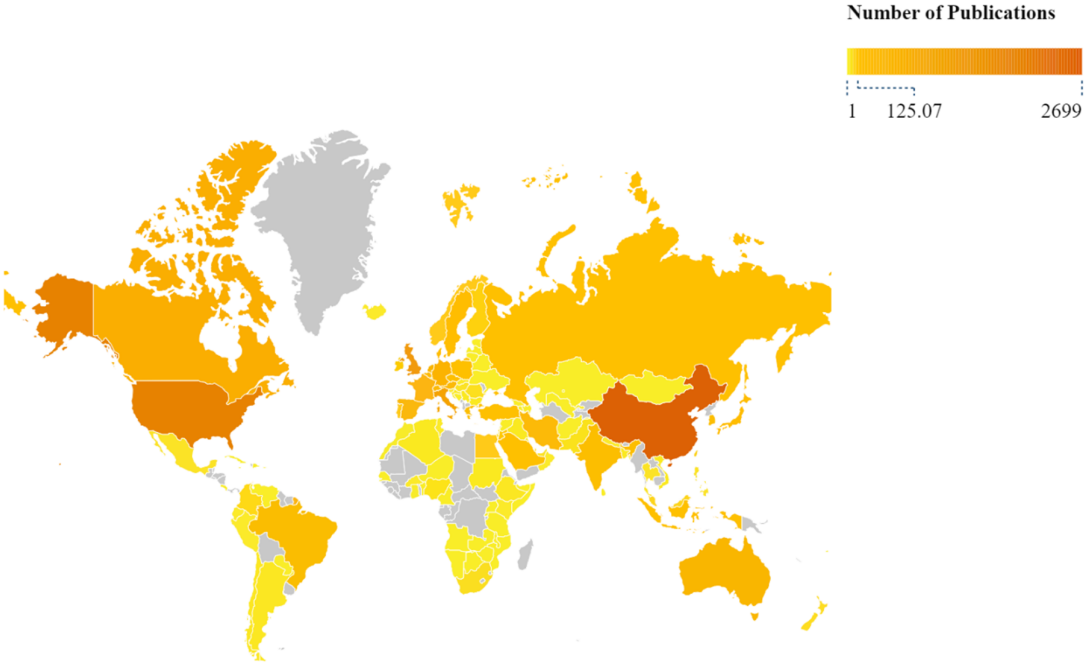

Figure 4. Geographic Distribution in Urological Evidence Synthesis
The choropleth map displays the global distribution of research activity in urology. Western Europe and North America, particularly Italy, Germany, and the United States, are key contributors, while China and Australia lead the Asia-Pacific region in output.

The United States demonstrates the strongest collaborative network with a total link strength of 3791, significantly higher than other nations. Italy and the United Kingdom follow with impressive collaborative metrics (link strengths of 3003 and 2863, respectively), indicating their crucial roles in international research partnerships. Continental European nations show robust international engagement, with Germany (n = 2336), France (n = 2103), and Austria (n = 1966) maintaining strong collaborative networks. Notable contributions also come from Canada (n = 1916), the Netherlands (n = 1876), Spain (n = 1399), and Switzerland (n = 1278), highlighting the global nature of research in this field (Figure 5).

Term Co-occurrence Patterns in Urological Evidence Synthesis

In total, 110,513 terms were identified in the titles and abstracts of the included systematic reviews and meta-analyses. For the term co-occurrence analysis, we considered terms that appeared at least 20 times, resulting in 2471 terms meeting this threshold. These terms were clustered into 5 distinct groups based on their co-occurrence patterns (Figure 6A). The most frequent terms across all clusters were "prostate cancer" (n = 2657 co-occurrences), "confidence interval" (n = 2195), "association" (n = 2036), "efficacy" (n = 1605), "cancer" (n = 1411), "case" (n = 1295), "randomized controlled trial" (n = 1232), "safety" (n = 1147), "control" (n = 1066), and "bladder cancer" (n = 1015). The bibliometric analysis revealed 5 major evidence

[DOI: 10.47176/mjiri.39.76]

synthesis domains in urological studies: the first cluster focused on drug efficacy and safety, particularly 5α-reductase inhibitors for benign prostatic hyperplasia; the second cluster concentrated on cancer risk assessment and genetic polymorphisms in bladder cancer; the third cluster encompassed analyses of various treatment modalities including radical prostatectomy, radiotherapy, chemotherapy, androgen deprivation therapy, and radical cystectomy in urological cancers; the fourth cluster examined comparative studies of postoperative complications across different surgical procedures, particularly comparing transurethral resection of prostate/bladder with alternative surgical approaches; and the fifth cluster centered on diagnostic accuracy studies, particularly involving prostate-specific antigen, imaging, and magnetic resonance imaging (MRI) for prostate cancer detection. Figure 6B presents the average publication years across these clusters. Recent publications in the dataset show an increased presence of terms related to darolutamide and poly-ADP ribose polymerase (PARP) inhibitors for prostate cancer treatment, as well as artificial intelligence applications in urology.

Author Keyword Co-occurrence Patterns in Urological Evidence Synthesis

The author keyword examination identified 11,462 distinct keywords across the publications. When filtered for keywords appearing 20 or more times, 215 keywords emerged as significant and were categorized into 8 thematic clusters (Figure 7A). The keyword distribution showed that methodological terms dominated the top frequencies, with

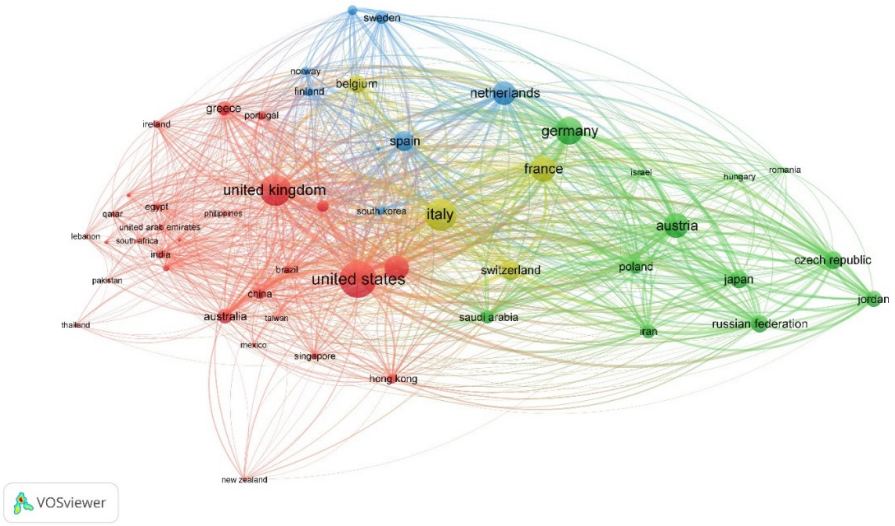

Figure 5. International Collaboration Networks in Urological Evidence Synthesis
The international collaboration network visualizes 52 countries involved in research partnerships, with node sizes representing total link strength. The United States holds the strongest collaborative ties (link strength: 3,791), followed by Italy (n=3,003) and the United Kingdom (n=2,863). Notable contributions come from Germany, France, Austria, Canada, the Netherlands, Spain, and Switzerland, highlighting a broad international research effort.

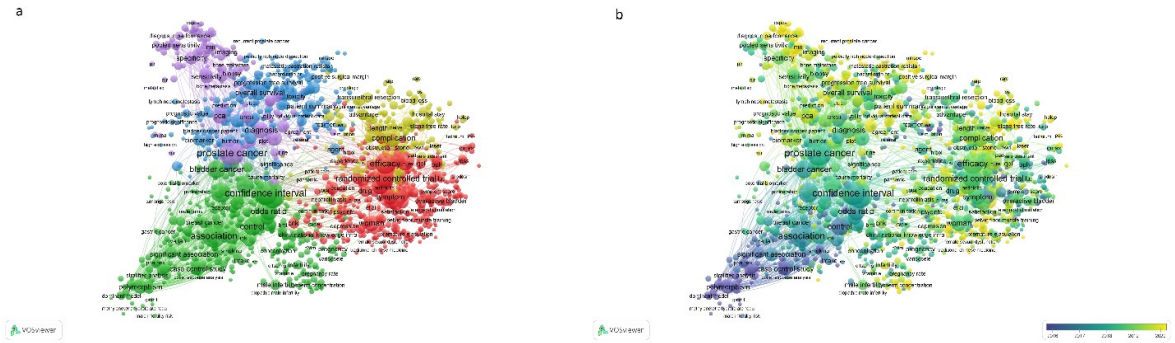

Figure 6. Term Co-Occurrence Patterns and Evolution in Urological Evidence Synthesis
(a) Co-Occurrence Patterns of Terms
The analysis reflects 2,471 terms with at least 20 occurrences across titles and abstracts of systematic reviews and meta-analyses in urology. Five distinct clusters were identified, with frequent terms including "prostate cancer" (2,657 occurrences), "confidence interval" (n=2,195), and "association" (n=2,036).
(b) Temporal Analysis of Term Clusters
The average publication years of clusters highlight emerging areas in urology research, such as the increasing focus on targeted therapies like darolutamide and PARP inhibitors, as well as the integration of artificial intelligence tools.

[DOI: 10.47176/mjiri.39.76]

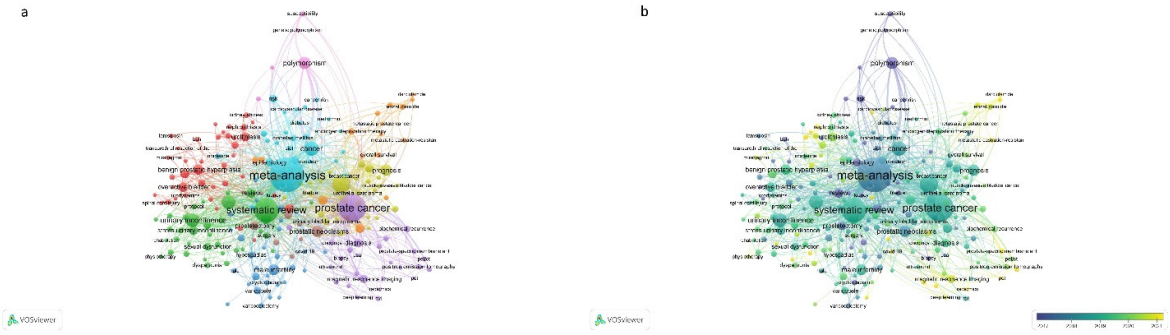

Figure 7. Keyword Clusters and Temporal Patterns in Urological Evidence Synthesis
(a) Co-Occurrence Analysis of Author Keywords
The analysis identifies 215 significant author keywords (occurring 20 or more times), organized into 8 thematic clusters. Frequent terms include "meta-analysis" (n=2,309), "systematic review" (n=1,070), "prostate cancer" (n=1,410), and "bladder cancer" (n=547).
(b) Temporal Trends in Keyword Clusters
The timeline analysis of keyword clusters demonstrates a growing emphasis on prostate cancer studies focusing on efficacy and safety, alongside a notable rise in deep learning and machine learning applications in urology.

"meta-analysis" being the most prevalent (2309 occurrences), followed by "prostate cancer" (1410 occurrences) and "systematic review" (1070 occurrences). Other frequently used keywords included "bladder cancer" (n = 547), "cancer" (n = 339), "urinary incontinence" (n = 308), "erectile dysfunction" (n = 307), "polymorphism" (n = 241), "prostatic neoplasms" (n = 206), and "prognosis" (n = 204). The keyword analysis revealed that the majority of studies focused on prostate cancer, bladder cancer, and urinary incontinence. Figure 7B illustrates the average publication years of these keyword clusters. Recent publications in the dataset show an increased focus on efficacy and safety studies in prostate cancer, as well as applications of deep learning and machine learning in urology.

Discussion

This bibliometric analysis reveals the remarkable evolution of evidence-based urology over 4 decades, from a single publication in 1987 to over 1000 in 2024. The dramatic acceleration after 2020 demonstrates the field's increasing commitment to systematic evidence synthesis methodologies. By examining publication trends, research leadership, collaboration networks, and thematic clusters, our findings provide valuable insights for researchers, clinicians, and policymakers in urology.

Our analysis reveals significant shifts in research leadership, with China emerging as the leading contributor, followed by the United States and the United Kingdom. The robust international collaboration networks, particularly among Western European nations, underscore the importance of cross-border partnerships in advancing urological evidence synthesis. Citation analysis of the top 50 papers shows a concentration of influential works during 2009 and 2015 (56%), coinciding with major technological advancements in surgical techniques and imaging. Oncology dominates the subject distribution, with landmark studies by Ficarra on robotic prostatectomy, Perera on PSMA PET imaging, Sylvester on BCG therapy, and Vale on neoadjuvant chemotherapy significantly reshaping treatment paradigms in bladder and prostate cancer management.

Term co-occurrence analysis revealed 5 distinct research clusters in urological evidence synthesis. The first cluster, dominated by drug efficacy and safety terminology, reflects ongoing efforts to optimize pharmacological management of benign prostatic conditions. This is exemplified by the extensive evaluation of 5α-reductase inhibitors (5ARIs), where meta-analyses have revealed complex risk-benefit profiles. A comprehensive meta-analysis of 37 studies involving 23,395 patients (5) showed that while 5ARI monotherapy significantly improved prostate volume and symptoms compared to placebo, effect sizes were modest with a declining trend in recent years.

Safety concerns with 5ARIs are significant, with meta-analyses revealing higher odds of sexual side effects, including decreased libido (OR, 1.7) and ejaculatory disorders (OR, 2.94). A focused analysis of 17,494 patients (6), confirmed increased sexual dysfunction in patients with benign prostatic hyperplasia (relative risk, 2.56, 95% CI, 1.48-4.42). When comparing different 5ARIs, a meta-analysis of 2116 patients (7) found dutasteride superior to finasteride in improving maximum urinary flow rate (mean difference, 0.32; 95% CI, 0.01-0.63); nonetheless, no significant differences were found in symptom scores, prostate volume, or adverse events. This careful balancing of therapeutic benefits against adverse effects explains the strong clustering around drug efficacy and safety terminology in our analysis.

The second cluster revealed significant patterns in genetic research, particularly in bladder cancer. A comprehensive review (8) identified 28 significant genetic variants primarily involved in chemical carcinogenesis, deoxyribonucleic acid repair, and cell cycle pathways. A systematic analysis of prognostic outcomes (9) Documented 316 single-nucleotide polymorphisms across various endpoints, with key variants in OGG1, TP53, and MDM2 genes. The clinical significance of these patterns is exemplified by NAT2 polymorphisms, where a meta-analysis of 54 studies (13,343 cases and 18,586 controls) (10) demonstrated that slow NAT2 genotypes significantly increased bladder cancer risk in specific populations and tumor grades. These

[DOI: 10.47176/mjiri.39.76]

findings reflect urology's evolution toward molecular stratification of cancers and personalized medicine approaches.

Moving to the third cluster on surgical interventions, transitioning from genetic research to surgical interventions, our analysis highlights significant developments in urological surgery, particularly in the comparison of traditional transurethral resection of the prostate (TURP) versus newer minimally invasive approaches. Meta-analyses demonstrate that newer techniques like Holmium laser enucleation of the prostate (HoLEP) show notably improved perioperative outcomes compared to conventional TURP (11, 12). For instance, HoLEP demonstrates shorter catheterization times, reduced hospital stays, and lower transfusion rates despite longer operative times. Similar benefits are seen with other innovations like bipolar TURP (B-TURP) and photoselective vaporization, which maintain comparable efficacy (12) while reducing complications. Interestingly, long-term outcome analysis across procedures reveals varying reoperation rates, with TURP showing 7.7% at 5 years compared to 6.6% for HoLEP (13). This information suggests that while newer techniques may offer immediate perioperative advantages, their long-term durability appears comparable to traditional approaches. However, some procedures like prostatic artery embolization show significantly higher reoperation rates of 23.8% at 5 years (13), highlighting the importance of careful patient selection and procedure choice. These findings underscore the ongoing evolution in urological surgical techniques and the need for continued long-term studies to fully assess the relative merits of new approaches compared to established procedures.

In line with the fifth cluster centered on diagnostic accuracy studies, building on these surgical advancements, our analysis also revealed significant progress in diagnostic tools for prostate cancer detection, particularly in imaging modalities. While prostate-specific antigen (PSA) testing shows high sensitivity (0.93) but poor specificity (0.20) for cancer detection in symptomatic patients (14), the integration of advanced imaging techniques has markedly improved diagnostic accuracy. Multiparametric MRI has emerged as a powerful tool, demonstrating high diagnostic value, with an area under the curve of 0.87 (15). The implementation of prebiopsy MRI combined with targeted biopsy has shown a 57% improvement in detecting clinically significant prostate cancer compared to conventional systematic biopsy approaches (16). Furthermore, recent developments in molecular imaging, particularly prostate-specific membrane antigen positron emission tomography (PSMA-PET), have further enhanced diagnostic capabilities. Studies show PSMA-PET significantly outperforms conventional imaging methods, with superior sensitivity and specificity for detecting lymph node involvement (73.7% vs 38.9% and 97.5% vs 82.6%, respectively) (17). This evolving diagnostic landscape, combining multiple imaging modalities with traditional PSA testing, represents a significant advancement in prostate cancer detection accuracy and staging capabilities. It highlights the field's move toward more precise and personalized diagnostic approaches, which aligns with the trends observed in our bibliometric analysis.

Moving from diagnostic advancements to treatment strategies, our analysis revealed important findings in the management of advanced prostate cancer. Studies demonstrated that intermittent androgen deprivation therapy (ADT) had comparable survival outcomes to continuous therapy while providing better quality of life for patients (18). However, it is crucial to note that ADT's cognitive impact should be carefully considered, as a significant number of studies have shown potential negative effects on cognitive functioning (19). For high-risk prostate cancer, our analysis highlighted the effectiveness of radical prostatectomy (RP) and radiation therapy (RT) plus ADT. Studies indicated that RP demonstrated significantly better overall survival than RT alone and lower cancer-specific mortality (20). Interestingly, when comparing RP to RT with ADT in high-risk cases, no clear superiority was observed in oncological outcomes (21), suggesting that treatment decisions should be tailored to individual patient factors.

Shifting focus to muscle-invasive bladder cancer (MIBC), our findings underscore the effectiveness of radical cystectomy (RC) as a treatment option (22). Notably, timing emerged as a crucial factor, with delays in RC after diagnosis significantly impacting overall survival negatively (23). The addition of adjuvant cisplatin-based chemotherapy after RC in locally advanced MIBC improved survival outcomes, with hazard ratios for progression-free survival and overall survival of 0.48 and 0.63, respectively (24). Interestingly, our analysis also revealed that trimodality therapy (TMT) showed comparable survival outcomes to RC in MIBC treatment. The 10-year overall survival rates were 30.9% for TMT and 35.1% for RC, with no statistically significant difference. Moreover, patients who experienced downstaging after neoadjuvant chemotherapy and RC showed improved survival compared to RC alone (25).

Last, for locally advanced prostate cancer with bladder invasion, our findings suggest that cystoprostatectomy emerged as a viable surgical option within a multimodal therapy approach, showing promising 5-year cancer-specific survival rates of up to 87.1% (26).

These comprehensive findings across various urological cancers and treatment modalities emphasize the importance of personalized treatment approaches and careful consideration of timing, particularly in surgical interventions for bladder cancer. They also highlight the evolving landscape of urological oncology, where multimodal approaches and careful patient selection are increasingly crucial for optimal outcomes.

The findings of this bibliometric analysis have several practical applications. For researchers, it highlights promising areas for future investigation and potential collaborations. Clinicians can use this information to stay informed about the most impactful areas of urological research, potentially influencing their practice. For policymakers and funding bodies, this analysis provides a roadmap for allocating resources to high-impact research areas in urology.

Our bibliometric analysis reveals several important areas for future research in urological evidence synthesis. Future studies should examine trends in the methodological qual-

[DOI: 10.47176/mjiri.39.76]

ity of urological systematic reviews and meta-analyses, focusing on adherence to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, bias risk assessments, and evidence quality grading. Research on the relationship between methodological quality and citation impact could provide valuable insights for improving evidence synthesis standards. Further investigation is needed into developing nations' contributions and barriers to participation in urological evidence synthesis, including studies on promoting international collaboration and capacity building, as well as analyzing the impact of such collaborations on research quality and citation patterns. Examination of emerging technologies and their integration into evidence synthesis methods is warranted. Research should explore the balance between clinical practice guidelines and available systematic review evidence. Future studies should investigate the impact of publication models (open access vs traditional) on citation patterns and clinical implementation. In addition, research should focus on factors influencing the translation of evidence synthesis into clinical practice guidelines and analyze the time lag between primary research publication and inclusion in systematic reviews.

This study has several limitations that should be acknowledged. First, our analysis was limited to publications indexed in Scopus, potentially missing relevant studies in other databases. Second, citation counts may be influenced by factors beyond scientific merit, such as journal impact factor or author reputation. Third, our analysis focused on quantitative metrics and may not fully capture the qualitative impact of publications on clinical practice. Fourth, the time lag in citation accumulation means that more recent publications may be underrepresented in citation-based analyses. Finally, while bibliometric analysis provides valuable insights into research trends and impact, it cannot directly assess the methodological quality or clinical relevance of the analyzed publications. Addressing these research gaps and acknowledging these limitations will contribute to advancing the field of urological evidence synthesis and improving its practical impact on patient care.

Conclusion

This bibliometric analysis demonstrates the significant growth and evolution of urological evidence synthesis over 4 decades, with publications increasing from a single study in 1987 to over 1000 in 2024. The field has seen a global shift in research productivity, with China, the United States, and the UK emerging as leading contributors, supported by strong international collaboration networks. Key focus areas include pharmacological management of benign prostatic conditions, genetic research in bladder cancer, advancements in surgical techniques, and improvements in diagnostic imaging for prostate cancer. While these developments reflect progress toward personalized medicine and precision diagnostics in urology, the analysis also highlights areas needing improvement. These include the need for long-term studies on newer surgical techniques, balancing efficacy with side effects in pharmacological interventions, and improving methodological quality in systematic reviews and meta-analyses. Future research should focus on enhancing international collaboration, particularly with developing nations, investigating the impact of publication models on clinical implementation, and analyzing factors influencing the translation of evidence synthesis into clinical practice guidelines. This study underscores the critical role of evidence synthesis in advancing urological patient care and provides a roadmap for future research priorities in the field.

AI-Assisted Language Enhancement Disclosure

Our research team employed artificial intelligence (AI) tools strictly for language refinement and readability optimization during manuscript preparation. All scientific content—including methodology, analyses, interpretations, and conclusions—represents original work independently developed by our research team. AI assistance was limited to linguistic enhancement and clarity improvement, with no contribution to the intellectual or scientific substance. This disclosure statement has been included in our manuscript for complete transparency.

Authors' Contributions

MAS and SBK conceptualized the study and were involved in study design and data analysis. GM developed and conducted the systematic literature search. AF and HA contributed significantly to the methodology, interpretation of results, and critical revision of the manuscript for intellectual content. HDB provided oversight throughout the research process, offered valuable academic input, and thoroughly reviewed the manuscript. All authors participated in revising the manuscript and approved the final version for submission.

Ethical Considerations

Since this study is a bibliometric analysis based on previously published literature, it does not require ethical approval or informed consent from participants.

Acknowledgment

Not applicable.

Conflict of Interests

The authors declare that they have no competing interests.

References

1. Bangdiwala SI. The importance of systematic reviews. Int J Inj Contr Saf Promot. 2024;31(3):347-9.
2. Moosapour H, Saeidifard F, Aalaa M, Soltani A, Larijani B. The rationale behind systematic reviews in clinical medicine: a conceptual framework. J Diabetes Metab Disord. 2021;20(1):919-29.
3. Donthu N, Kumar S, Mukherjee D, Pandey N, Lim WM. How to conduct a bibliometric analysis: An overview and guidelines. J Bus Res. 2021;133:285-96.
4. Kulkarni AV, Aziz B, Shams I, Busse JW. Comparisons of Citations in Web of Science, Scopus, and Google Scholar for Articles Published in General Medical Journals. JAMA. 2009;302(10):1092-6.
5. Kim JH, Baek MJ, Sun HY, Lee B, Li S, Khandwala Y, et al. Efficacy and safety of 5 alpha-reductase inhibitor monotherapy in patients with benign prostatic hyperplasia: A meta-analysis. PLOS ONE. 2018;13(10):e0203479.
6. Liu L, Zhao S, Li F, Li E, Kang R, Luo L, et al. Effect of 5α-Reductase Inhibitors on Sexual Function: A Meta-Analysis and Systematic Review

[DOI: 10.47176/mjiri.39.76]

of Randomized Controlled Trials. J Sex Med. 2016;13(9):1297-310.
7. Li Y, Ma J, Qin XH, Hu CY. The efficacy and safety of dutasteride and finasteride in patients with benign prostatic hyperplasia: a systematic review and meta-analysis. Transl Androl Urol. 2022;11(3):313-24.
8. de Maturana EL, Rava M, Anumudu C, Sáez O, Alonso D, Malats N. Bladder Cancer Genetic Susceptibility. A Systematic Review. Bladder cancer. 2018;4(2):215-26.
9. Lipunova N, Wesselius A, Cheng KK, van Schooten FJ, Cazier J-B, Bryan RT, et al. Systematic Review: Genetic Associations for Prognostic Factors of Urinary Bladder Cancer. Biomark Cancer. 2019;11:1179299X19897255.
10. Song Y, Qi X, Liu X. N-acetyltransferase 2 polymorphism is associated with bladder cancer risk: An updated meta-analysis based on 54 case-control studies. Gene. 2020;757:144924.
11. Chen F, Chen Y, Zou Y, Wang Y, Wu X, Chen M. Comparison of holmium laser enucleation and transurethral resection of prostate in benign prostatic hyperplasia: a systematic review and meta-analysis. J Int Med Res. 2023;51(8):03000605231190763.
12. Cornu J-N, Ahyai S, Bachmann A, de la Rosette J, Gilling P, Gratzke C, et al. A Systematic Review and Meta-analysis of Functional Outcomes and Complications Following Transurethral Procedures for Lower Urinary Tract Symptoms Resulting from Benign Prostatic Obstruction: An Update. Eur Urol. 2015;67(6):1066-96.
13. He W, Ding T, Niu Z, Hao C, Li C, Xu Z, et al. Reoperation after surgical treatment for benign prostatic hyperplasia: a systematic review. Front Endocrinol. 2023;14:1287212.
14. Merriel SWD, Pocock L, Gilbert E, Creavin S, Walter FM, Spencer A, et al. Systematic review and meta-analysis of the diagnostic accuracy of prostate-specific antigen (PSA) for the detection of prostate cancer in symptomatic patients. BMC Med. 2022;20(1):54.
15. Zhen L, Liu X, Yegang C, Yongjiao Y, Yawei X, Jiaqi K, et al. Accuracy of multiparametric magnetic resonance imaging for diagnosing prostate Cancer: a systematic review and meta-analysis. BMC Cancer. 2019;19(1):1244.
16. Elwenspoek MMC, Sheppard AL, McInnes MDF, Merriel SWD, Rowe EWJ, Bryant RJ, et al. Comparison of Multiparametric Magnetic Resonance Imaging and Targeted Biopsy With Systematic Biopsy Alone for the Diagnosis of Prostate Cancer: A Systematic Review and Meta-analysis. JAMA Netw Open. 2019;2(8):e198427-e.
17. Chow KM, So WZ, Lee HJ, Lee A, Yap DWT, Takwoingi Y, et al. Head-to-head Comparison of the Diagnostic Accuracy of Prostate-specific Membrane Antigen Positron Emission Tomography and Conventional Imaging Modalities for Initial Staging of Intermediate- to High-risk Prostate Cancer: A Systematic Review and Meta-analysis. Eur Urol. 2023;84(1):36-48.
18. Magnan S, Zarychanski R, Pilote L, Bernier L, Shemilt M, Vigneault E, et al. Intermittent vs Continuous Androgen Deprivation Therapy for Prostate Cancer: A Systematic Review and Meta-analysis. JAMA Oncol. 2015;1(9):1261-9.
19. Andela CD, Matte R, Jazet IM, Zonneveld WC, Schoones JW, Meinders AE. Effect of androgen deprivation therapy on cognitive functioning in men with prostate cancer: A systematic review. Int J Urol. 2021;28(8):786-98.
20. Lei JH, Liu LR, Wei Q, Yan SB, Song TR, Lin FS, et al. Systematic Review and Meta-analysis of the Survival Outcomes of First-line Treatment Options in High-risk Prostate Cancer. Sci Rep. 2015;5(1):7713.
21. Heesterman BL, Aben KKH, de Jong IJ, Pos FJ, van der Hel OL. Radical prostatectomy versus external beam radiotherapy with androgen deprivation therapy for high-risk prostate cancer: a systematic review. BMC Cancer. 2023;23(1):398.
22. Zhao J, Zhou L, Pan Y, Chen L. A systematic review and meta-analysis of radical cystectomy in the treatment of muscular invasive bladder cancer (MIBC). Transl Androl Urol. 2021;10(8):3476-85.
23. Russell B, Liedberg F, Khan MS, Nair R, Thurairaja R, Malde S, et al. A Systematic Review and Meta-analysis of Delay in Radical Cystectomy and the Effect on Survival in Bladder Cancer Patients. Eur Urol Oncol. 2020;3(2):239-49.
24. Kim DK, Lee JY, Jung JH, Hah YS, Cho KS. Role of adjuvant cisplatin-based chemotherapy following radical cystectomy in locally advanced muscle-invasive bladder cancer: Systematic review and meta-analysis of randomized trials. Investig Clin Urol. 2019;60(2):64-74.
25. Fahmy O, Khairul-Asri MG, Schubert T, Renninger M, Malek R, Kübler H, et al. A systematic review and meta-analysis on the oncological long-term outcomes after trimodality therapy and radical cystectomy with or without neoadjuvant chemotherapy for muscle-invasive bladder cancer. Urol Oncol. 2018;36(2):43-53.
26. Yuan P, Wang S, Liu X, Wang X, Ye Z, Chen Z. The role of cystoprostatectomy in the management of locally advanced prostate cancer: a systematic review. World J Surg Oncol. 2020;18(1):14.

[DOI: 10.47176/mjiri.39.76]

Appendix. Comprehensive MeSH Terms, Keywords, and Search Strategies Used for Retrieval in Systematic Review and Meta-Analysis of Urological Conditions

1)

TITLE-ABS("Reproductive Tract Infection*") OR TITLE-ABS("Genital Tract Infection*") OR TITLE-ABS("Spermatic Cord Torsion*") OR TITLE-ABS("Testicular Torsion*") OR TITLE-ABS("Torsion of Testicular Cord") OR TITLE-ABS(spermatocel*) OR TITLE-ABS("Epididymal Cyst*") OR TITLE-ABS("Testicular Disease*") OR TITLE-ABS(cryptorchidism) OR TITLE-ABS(cryptorchism) OR TITLE-ABS("Undescended Testicl*") OR TITLE-ABS("Bilateral Cryptorchidism") OR TITLE-ABS("Unilateral Cryptorchidism") OR TITLE-ABS("Abdominal Cryptorchidism") OR TITLE-ABS("Inguinal Cryptorchidism") OR TITLE-ABS(orchitis) OR TITLE-ABS("Testicular Hydrocel*") OR TITLE-ABS("Scrotal Hydrocel*") OR TITLE-ABS("Vaginal Hydrocel*") OR TITLE-ABS("Varicocel*") OR TITLE-ABS(globozoospermia) OR TITLE-ABS("Penile Disease*") OR TITLE-ABS("Penis Disease*") OR TITLE-ABS(balanitis) OR TITLE-ABS("Balanitis Xerotica Obliterans") OR TITLE-ABS("Kraurosis Penis") OR TITLE-ABS("Penile Induration") OR TITLE-ABS("Fibrous Cavernitis") OR TITLE-ABS("Peyronie Disease") OR TITLE-ABS("Peyronie's Disease") OR TITLE-ABS("Peyronies Disease") OR TITLE-ABS("Plastic Induration of the Penis") OR TITLE-ABS("Penile Fibromatosis") OR TITLE-ABS(phimosis) OR TITLE-ABS(paraphimosis) OR TITLE-ABS (priapism) OR TITLE-ABS(priapisms) OR TITLE-ABS("Prostatic Disease*") OR TITLE-ABS("Prostatic Hyperplasia") OR TITLE-ABS("Prostatic Adenoma") OR TITLE-ABS("Prostatic Hypertrophy") OR TITLE-ABS("Prostatic Hypertrophies") OR TITLE-ABS("Benign Prostatic Hyperplasia") OR TITLE-ABS("Benign Prostatic Hypertrophy") OR TITLE-ABS(prostatitis) OR TITLE-ABS("Acute Bacterial Prostatitis") OR TITLE-ABS("Chronic Bacterial Prostatitis") OR TITLE-ABS("Chronic Prostatitis with Chronic Pelvic Pain Syndrome") OR TITLE-ABS("Asymptomatic Inflammatory Prostatitis") OR TITLE-ABS("Fournier's Gangrene") OR TITLE-ABS("Fourniers Gangrene") OR TITLE-ABS(hematocele) OR TITLE-ABS(hematoceles) OR TITLE-ABS("Testicular Hematocele*") OR TITLE-ABS("Scrotal Hematocele*") OR TITLE-ABS(hemospermia) OR TITLE-ABS(hematospermia) OR TITLE-ABS("Male Infertility") OR TITLE-ABS("Male Sterility") OR TITLE-ABS("Male Subfertility") OR TITLE-ABS("Male Sub-Fertility") OR TITLE-ABS(aspermia) OR TITLE-ABS(asthenozoospermia) OR TITLE-ABS("Astheno Teratozoospermia") OR TITLE-ABS(asthenoteratozoospermia) OR TITLE-ABS(azoospermia) OR TITLE-ABS(oligospermia) OR TITLE-ABS("Sertoli Cell-Only Syndrome") OR TITLE-ABS("Sertoli Cell Only Syndrome") OR TITLE-ABS("Germinal Cell Aplasia") OR TITLE-ABS ("Del Castillo Syndrome") OR TITLE-ABS(teratozoospermia) OR TITLE-ABS(teratospermia) OR TITLE-ABS("Abnormal Spermatozoa") OR TITLE-ABS("Cancer of Urinary Tract") OR TITLE-ABS("Urinary Tract Cancer*") OR TITLE-ABS("Urologic Cancer*") OR TITLE-ABS("Cancer of the Urinary Tract") OR TITLE-ABS("Urological Cancer*") OR TITLE-ABS("Transmissible Venereal Tumor*") OR TITLE-ABS("Veterinary Venereal Tumor*") OR TITLE-ABS(dyspareunia) OR TITLE-ABS("Ejaculatory Dysfunction*") OR TITLE-ABS("Ejaculation Dysfunction*") OR TITLE-ABS(anejaculation) OR TITLE-ABS("Delayed Ejaculation") OR TITLE-ABS("Ejaculatory Incompetence") OR TITLE-ABS("Premature Ejaculation*") OR TITLE-ABS("Ejaculatio Praecox") OR TITLE-ABS("Retrograde Ejaculation*") OR TITLE-ABS(epididymitis) OR TITLE-ABS("Erectile Dysfunction") OR TITLE-ABS(impotence) OR TITLE-ABS("Male Impotence") OR TITLE-ABS("Male Sexual Impotence") OR TITLE-ABS("Vasculogenic Impotence") OR TITLE-ABS("Arteriogenic Impotence") OR TITLE-ABS("Venogenic Impotence") OR TITLE-ABS("Penile Venous Leakage") OR TITLE-ABS("Fournier Gangrene") OR TITLE-ABS("Fournier Disease") OR TITLE-ABS("Fournier's Disease") OR TITLE-ABS("Fourniers Disease") OR TITLE-ABS("Androgen-Insensitive Prostatic Cancer*") OR TITLE-ABS("Androgen Insensitive Prostatic Cancer*") OR TITLE-ABS("Androgen-Resistant Prostatic Cancer*") OR TITLE-ABS("Androgen Resistant Prostatic Cancer*") OR TITLE-ABS ("Castration Resistant Prostatic Cancer*") OR TITLE-ABS("Hormone Refractory Prostatic Cancer*") OR TITLE-ABS("Androgen-Independent Prostatic Cancer*") OR TITLE-ABS("Androgen Independent Prostatic Cancer*") OR TITLE-ABS("Testicular Neoplasm*") OR TITLE-ABS("Testicular Tumor*") OR TITLE-ABS("Testis Neoplasm*") OR TITLE-ABS("Tumor of Rete Testis") OR TITLE-ABS("Rete Testis Tumor*") OR TITLE-ABS("Cancer of Testis") OR TITLE-ABS("Testicular Cancer*") OR TITLE-ABS("Testis Cancer*") OR TITLE-ABS("Cancer of the Testis") OR TITLE-ABS("Sertoli-Leydig Cell Tumor*") OR TITLE-ABS("Sertoli Leydig Cell Tumor*") OR TITLE-ABS(androblastoma) OR TITLE-ABS(androblastomas) OR TITLE-ABS(arrhenoblastoma) OR TITLE-ABS(arrhenoblastomas) OR TITLE-ABS("Leydig Cell Tumor*") OR TITLE-ABS("Interstitial Cell Tumor*") OR TITLE-ABS("Sertoli Cell Tumor*") OR TITLE-ABS("Urologic Neoplasm*") OR TITLE-ABS("Urological Neoplasm*") OR TITLE-ABS("Urinary Tract Neoplasm*") OR TITLE-ABS("Genitourinary Neoplasm*") OR TITLE-ABS("Genito-urinary Neoplasm*") OR TITLE-ABS("Genitourinary Cancer*") OR TITLE-ABS("Urogenital Cancer*") OR TITLE-ABS("Genito-urinary Cancer*") OR TITLE-ABS("Genito urinary Cancer*") OR TITLE-ABS("Male Genital Neoplasm*") OR TITLE-ABS("Penile Neoplasm*") OR TITLE-ABS("Penis Neoplasm*") OR TITLE-ABS("Cancer of Penis") OR TITLE-ABS("Penile Cancer*") OR TITLE-ABS("Cancer of the Penis") OR TITLE-ABS("Penis Cancer*") OR TITLE-ABS("Prostatic Neoplasm*") OR TITLE-ABS("Prostate Neoplasm*") OR TITLE-ABS("Prostate Cancer*") OR TITLE-ABS("Cancer of Prostate") OR TITLE-ABS("Cancer of the Prostate") OR TITLE-ABS("Prostatic Cancer*") OR TITLE-ABS("Castration-Resistant Prostatic Neoplasm*") OR TITLE-ABS("Androgen-Independent Prostatic Neoplasm*") OR TITLE-ABS("Androgen Independent Prostatic Neoplasm*") OR TITLE-ABS("Androgen-Insensitive Prostatic Neoplasm*") OR TITLE-ABS("Androgen Insensitive Prostatic Neoplasm*") OR TITLE-ABS("Androgen-Resistant Prostatic Neoplasm*") OR TITLE-ABS("Androgen Resistant Prostatic Neoplasm*") OR TITLE-ABS("Castration Resistant Prostatic Neoplasm*") OR TITLE-ABS("Hormone Refractory Prostatic Neoplasm*") OR TITLE-ABS("Castration-Resistant Prostatic Cancer*") OR TITLE-ABS(hypospadias) OR TITLE-ABS(hypospadia) OR TITLE-ABS("Retrocaval Ureter") OR TITLE-ABS("Circumcaval Ureter") OR TITLE-ABS("Urinary Fistula") OR TITLE-ABS("Urinary Fistulas") OR TITLE-ABS("Urogenital Neoplasm*") OR TITLE-ABS("Monosomy X") OR TITLE-ABS("Ovotesticular Disorders of Sex Development") OR TITLE-ABS("Ovotesticular DSD") OR TITLE-ABS("Ovotesticular DSDs") OR TITLE-ABS("Ovotesticular Disorder of Sex Development") OR TITLE-ABS("True Hermaphroditism*") OR TITLE-ABS ("Familial True Hermaphroditism*") OR TITLE-ABS("Familial XX True Hermaphroditism") OR TITLE-ABS("Sex Chromosome Disorders of Sex Development") OR TITLE-ABS ("Sex Chromosome DSD") OR TITLE-ABS("Sex Chromosome DSDs") OR TITLE-ABS("Freemartinism") OR TITLE-ABS("Klinefelter Syndrome*") OR TITLE-ABS("Klinefelter's Syndrome") OR TITLE-ABS("Klinefelters Syndrome") OR TITLE-ABS("XXY Syndrome*") OR TITLE-ABS("XXY Trisomy") OR TITLE-ABS("XXY Trisomies") OR TITLE-ABS("Xxyy Syndrome*") OR TITLE-ABS("XXXY Male*") OR TITLE-ABS("Fraser Syndrome") OR TITLE-ABS("Cryptophthalmos-Syndactyly Syndrome*") OR TITLE-ABS("Cryptophthalmos Syndactyly Syndrome") OR TITLE-ABS("Cryptophthalmos with Other Malformation*") OR TITLE-ABS("Kallmann Syndrome") OR TITLE-ABS("Anosmic Hypogonadism*") OR TITLE-ABS("Anosmic Idiopathic Hypogonadotropic Hypogonadism") OR TITLE-ABS("Dysplasia Olfactogenitalis of De Morsier") OR TITLE-ABS("Hypogonadotropic Hypogonadism and Anosmia") OR TITLE-ABS("Hypogonadotropic Hypogonadism-Anosmia Syndrome") OR TITLE-ABS("Kallmann's Syndrome") OR TITLE-ABS("Kallmanns Syndrome") OR TITLE-ABS("Kallmann Syndrome 1") OR TITLE-ABS("Kallmann Syndrome 2") OR TITLE-ABS("Autosomal Dominant Form of Kallmann Syndrome") OR TITLE-ABS("Kallmann Syndrome 3") OR TITLE-ABS("Autosomal Recessive Form of Kallmann Syndrome") OR TITLE-ABS("Gonadal Dysgenesis") OR TITLE-ABS("Gonadal Agenesis") OR TITLE-ABS(gonadoblastoma) OR TITLE-ABS("Mixed Gonadal Dysgenesis") OR TITLE-ABS("Sexual Infantilism") OR TITLE-ABS("Genital Infantilism") OR TITLE-ABS("Turner Syndrome") OR TITLE-ABS("Turner's Syndrome") OR TITLE-ABS("Turners Syndrome") OR TITLE-ABS("Ullrich-Turner Syndrome") OR TITLE-ABS("Ullrich Turner Syndrome") OR TITLE-ABS("Bonnevie-Ullrich Syndrome") OR

[DOI: 10.47176/mjiri.39.76]

TITLE-ABS("Bonnevie Ullrich Syndrome") OR TITLE-ABS("Status Bonnevie-Ullrich") OR TITLE-ABS("Status Bonnevie Ullrich") OR TITLE-ABS("XO Gonadal Dysgenesis") OR TITLE-ABS("Male Pseudohermaphroditism*") OR TITLE-ABS("Androgen-Insensitivity Syndrome*") OR TITLE-ABS("Androgen Insensitivity Syndrome*") OR TITLE-ABS("Androgen Resistance Syndrome*") OR TITLE-ABS("Male Pseudohermaphroditism Due to Androgen Insensitivity") OR TITLE-ABS("Testicular Feminization*") OR TITLE-ABS("Complete Androgen-Insensitivity Syndrome*") OR TITLE-ABS("Testicular Feminization Syndrome*") OR TITLE-ABS("Reifenstein Syndrome") OR TITLE-ABS("Partial Androgen Insensitivities") OR TITLE-ABS("Partial Androgen Insensitivity") OR TITLE-ABS("Partial Androgen-Insensitivity Syndrome*") OR TITLE-ABS("Partial Androgen Insensitivity Syndrome*") OR TITLE-ABS("Reifenstein's Syndrome") OR TITLE-ABS("Reifensteins Syndrome") OR TITLE-ABS("Androgen Receptor Deficiency") OR TITLE-ABS("Androgen Receptor Deficiencies") OR TITLE-ABS("Dihydrotestosterone Receptor Deficiency") OR TITLE-ABS("Dihydrotestosterone Receptor Deficiencies") OR TITLE-ABS("AR Deficiency") OR TITLE-ABS("AR Deficiencies") OR TITLE-ABS("DHTR Deficiency") OR TITLE-ABS("DHTR Deficiencies") OR TITLE-ABS("Drash Syndrome") OR TITLE-ABS("Wilms Tumor and Pseudohermaphroditism") OR TITLE-ABS("Gonadal Dysgenesis, 46,XY") OR TITLE-ABS("Gonadal Dysgenesis, 46, XY") OR TITLE-ABS ("Swyer Syndrome") OR TITLE-ABS("XY Pure Gonadal Dysgenesis") OR TITLE-ABS("Genitourinary Abnormality") OR TITLE-ABS("Disorders of Sex Development") OR TITLE-ABS("Sexual Development Disorder*") OR TITLE-ABS("Sex Development Disorder*") OR TITLE-ABS("Disorders of Sexual Development") OR TITLE-ABS(pseudohermaphroditism) OR TITLE-ABS(hermaphroditism) OR TITLE-ABS(intersexuality) OR TITLE-ABS(intersexualities) OR TITLE-ABS("Intersex Condition*") OR TITLE-ABS("Ambiguous Genitalia") OR TITLE-ABS("Genital Ambiguity") OR TITLE-ABS("Genital Ambiguities") OR TITLE-ABS("Sex Differentiation Disorder*") OR TITLE-ABS("Sexual Differentiation Disorder*") OR TITLE-ABS("46, XX Disorders of Sex Development") OR TITLE-ABS("46, XX DSD") OR TITLE-ABS("46,XX Disorders of Sex Development") OR TITLE-ABS("46,XX DSD") OR TITLE-ABS("Female Pseudohermaphroditism*") OR TITLE-ABS("46, XX Testicular Disorders of Sex Development") OR TITLE-ABS("XX Sex Reversal*") OR TITLE-ABS("XX Male Syndrome*") OR TITLE-ABS("Gonadal Dysgenesis, 46,XX") OR TITLE-ABS("Adrenogenital Syndrome*") OR TITLE-ABS ("Congenital Adrenal Hyperplasia") OR TITLE-ABS("Disorder of Sex Development, 46,XY") OR TITLE-ABS("Disorder of Sex Development, 46, XY") OR TITLE-ABS("Urinary Schistosomiasis") OR TITLE-ABS("Urogenital Schistosomiasis") OR TITLE-ABS("Daytime Urinary Incontinence") OR TITLE-ABS("Nighttime Urinary Incontinence") OR TITLE-ABS("Urinary Incontinence") OR TITLE-ABS("Urinary Stress Incontinence") OR TITLE-ABS("Urge Incontinence") OR TITLE-ABS("Urinary Reflex Incontinence") OR TITLE-ABS("Urinary Urge Incontinence") OR TITLE-ABS(urolithiasis) OR TITLE-ABS("Urinary Lithiasis") OR TITLE-ABS("Female Urogenital Disease*") OR TITLE-ABS("Female Genitourinary Disease*") OR TITLE-ABS("Urogenital Tuberculosis") OR TITLE-ABS("Female Genital Tuberculosis") OR TITLE-ABS("Male Genital Tuberculosis") OR TITLE-ABS("Urogenital Abnormalities") OR TITLE-ABS("Urogenital Abnormality") OR TITLE-ABS("Genitourinary Abnormalities") OR TITLE-ABS("Bladder Neurogenesis") OR TITLE-ABS("Atonic Neurogenic Bladder") OR TITLE-ABS("Spastic Neurogenic Bladder") OR TITLE-ABS("Uninhibited Neurogenic Bladder") OR TITLE-ABS("Overactive Bladder") OR TITLE-ABS("Overactive Urinary Bladder") OR TITLE-ABS("Overactive Detrusor") OR TITLE-ABS("Overactive Detrusor Function") OR TITLE-ABS("Underactive Bladder*") OR TITLE-ABS("Underactive Urinary Bladder*") OR TITLE-ABS("Detrusor Underactivity") OR TITLE-ABS("Underactive Detrusor*") OR TITLE-ABS("Underactive Detrusor Function*") OR TITLE-ABS("Hypotonic Bladder*") OR TITLE-ABS("Vesico-Ureteral Reflux") OR TITLE-ABS("Vesico Ureteral Reflux") OR TITLE-ABS("Vesicoureteral Reflux") OR TITLE-ABS("Vesicoureteral Reflux 1") OR TITLE-ABS("Vesicoureteral Reflux Grade1") OR TITLE-ABS("Vesicoureteral Reflux1") OR TITLE-ABS("Vesicoureteral Reflux1s") OR TITLE-ABS("Primary Vesicoureteral Reflux") OR TITLE-ABS("Secondary Vesicoureteral Reflux") OR TITLE-ABS("Schistosomiasis haematobia") OR TITLE-ABS("Schistosoma haematobia Infection*") OR TITLE-ABS("Schistosomiasis haematobium") OR TITLE-ABS("Urinary Bladder Stone*") OR TITLE-ABS("Vesical Calculi") OR TITLE-ABS("Vesical Calculus") OR TITLE-ABS("Urinary Bladder Fistula*") OR TITLE-ABS ("Vesical Fistula*") OR TITLE-ABS("Vesicovaginal Fistula*") OR TITLE-ABS("Vesico-Vaginal Fistula*") OR TITLE-ABS("Vesico Vaginal Fistula*") OR TITLE-ABS("Urinary Bladder Neoplasm*") OR TITLE-ABS("Bladder Neoplasm*") OR TITLE-ABS("Bladder Tumor*") OR TITLE-ABS("Urinary Bladder Cancer*") OR TITLE-ABS("Bladder Cancer*") OR TITLE-ABS("Cancer of Bladder") OR TITLE-ABS("Cancer of the Bladder") OR TITLE-ABS("Malignant Tumor of Urinary Bladder") OR TITLE-ABS("Non-Muscle Invasive Bladder Neoplasm*") OR TITLE-ABS("Non Muscle Invasive Bladder Neoplasm*") OR TITLE-ABS("Non-Muscle Invasive Bladder Cancer*") OR TITLE-ABS(nmibc) OR TITLE-ABS("Non-Muscle-Invasive Bladder Cancer*") OR TITLE-ABS("Neurogenic Urinary Bladder") OR TITLE-ABS("Neurogenic Bladder") OR TITLE-ABS("Neurogenic Bladder Disorder*") OR TITLE-ABS("Neurogenic Dysfunction of the Urinary Bladder") OR TITLE-ABS("Neuropathic Bladder") OR TITLE-ABS("Urinary Bladder Neurogenic Dysfunction") OR TITLE-ABS("Neurogenic Urinary Bladder Disorder") OR TITLE-ABS("Urinary Bladder Neurogenesis") OR TITLE-ABS("Anterior Urethral Stricture*") OR TITLE-ABS("Posterior Urethral Stricture*") OR TITLE-ABS("Urinary Bladder Neck Obstruction*") OR TITLE-ABS("Bladder Neck Obstruction*") OR TITLE-ABS ("Bladder Outlet Obstruction*") OR TITLE-ABS(urethritis) OR TITLE-ABS("Urinary Bladder Disease*") OR TITLE-ABS("Bladder Exstrophy") OR TITLE-ABS("Bladder Exstrophies") OR TITLE-ABS("Exstrophy of the Bladder") OR TITLE-ABS("Urinary Bladder Exstrophy") OR TITLE-ABS("Urinary Bladder Exstrophies") OR TITLE-ABS("Exstrophy of Bladder") OR TITLE-ABS("Hemorrhagic Cystitis") OR TITLE-ABS(cystocele) OR TITLE-ABS("Fallen Urinary Bladder") OR TITLE-ABS("Urinary Bladder Prolapse") OR TITLE-ABS("Urinary Bladder Calculi") OR TITLE-ABS("Urinary Bladder Calculus") OR TITLE-ABS("Bladder Calculi") OR TITLE-ABS("Bladder Calculus") OR TITLE-ABS("Bladder Stone*") OR TITLE-ABS("Calculi of Urinary Bladder") OR TITLE-ABS(cystolith*) OR TITLE-ABS ("Ureteral Disease*") OR TITLE-ABS("Ureteral Neoplasm*") OR TITLE-ABS("Neoplasms of Ureter") OR TITLE-ABS("Ureter Neoplasm*") OR TITLE-ABS("Cancer of Ureter") OR TITLE-ABS("Ureter Cancer*") OR TITLE-ABS("Ureteral Cancer*") OR TITLE-ABS("Cancer of the Ureter") OR TITLE-ABS("Ureteral Obstruction*") OR TITLE-ABS("Ureterocel*") OR TITLE-ABS(ureterolithiasis) OR TITLE-ABS("Ureteral Calculi") OR TITLE-ABS("Ureteral Calculus") OR TITLE-ABS("Urethral Disease*") OR TITLE-ABS(epispadias) OR TITLE-ABS(epispadia) OR TITLE-ABS("Urethral Neoplasm*") OR TITLE-ABS("Urethra Neoplasm*") OR TITLE-ABS("Cancer of Urethra") OR TITLE-ABS("Urethra Cancer*") OR TITLE-ABS("Urethral Cancer*") OR TITLE-ABS("Cancer of the Urethra") OR TITLE-ABS("Urethral Obstruction*") OR TITLE-ABS("Urethral Stricture*") OR TITLE-ABS("Urethral Stenosis") OR TITLE-ABS(nephrolithiasis) OR TITLE-ABS("Kidney Calculi") OR TITLE-ABS("Kidney Calculus") OR TITLE-ABS("Kidney Stone*") OR TITLE-ABS("Renal Calculi") OR TITLE-ABS("Renal Calculus") OR TITLE-ABS(nephrolith) OR TITLE-ABS(urolog*) OR TITLE-ABS ("urogenital tract disease*") OR TITLE-ABS("urinary tract disease*") OR TITLE-ABS("bladder disease*") OR TITLE-ABS("obstructive uropathy*") OR TITLE-ABS("ureter disease*") OR TITLE-ABS("urethra disease*") OR TITLE-ABS("urinary tract fistula") OR TITLE-ABS("urinary tract tumor") OR TITLE-ABS("urolithiasis") OR TITLE-ABS("urogenital tract disease") OR TITLE-ABS("genital system disease") OR TITLE-ABS("urinary tract disease") OR TITLE-ABS("urogenital tract infection") OR TITLE-ABS("urogenital tract injury") OR TITLE-ABS("urogenital tract malformation") OR TITLE-ABS("urogenital tract tumor*") OR TITLE-ABS("urogenital ulcer*")

2)

TITLE("systematic* review*") OR TITLE("meta-analysis") OR TITLE("meta analysis")

3)

1 AND 2 AND PUBYEAR < 2025

[DOI: 10.47176/mjiri.39.76]