

# BMJ Open Urinary incontinence in older men: protocol for a scoping review of risk factors

Olawunmi Olagundoye ,<sup>1</sup> Janice Y Kung,<sup>2</sup> William Gibson ,<sup>1</sup> Adrian Wagg<sup>1</sup>

**To cite:** Olagundoye O, Kung JY, Gibson W, *et al.* Urinary incontinence in older men: protocol for a scoping review of risk factors. *BMJ Open* 2023;**13**:e068956. doi:10.1136/bmjopen-2022-068956

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2022-068956>).

Received 07 October 2022  
Accepted 23 January 2023

## ABSTRACT

**Introduction** Urinary incontinence (UI) is common among older men. Epidemiological studies have established many risk factors for UI but these studies are not always specific to men aged 65 and above. The literature is yet to be systematically and comprehensively reviewed to identify UI risk factors specific to these men. Such evidence is required for the development of evidence-based interventions. This scoping review will synthesise evidence regarding UI risk factors in older men.

**Methods and analysis** The Joanna Briggs Institute (JBI) method for scoping reviews will guide the conduct of this scoping review and its reporting alongside the Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping reviews checklist. JBI's Population, Concept and Context framework is used to frame inclusion criteria, and JBI's scoping review protocol template was used to format this protocol. Our comprehensive search will include Ovid MEDLINE, Ovid Embase, CINAHL, Scopus, Web of Science Core Collection, Cochrane Library (via Wiley) and ProQuest Dissertations & Theses Global. There will be no language restriction since approximately 10% of preliminary search results were in languages other than English. Study type or publication date will not be restricted. Besides databases, we will review Google Scholar results and bibliographies. Two independent reviewers will screen, select and extract eligible studies. A preliminary search was performed on 24 May 2022. The search strategy and data extraction template are in online supplemental appendix. A qualitative and quantitative analysis of data will be performed as a means of describing the risk factors for UI identified among older men by using frequencies and descriptive methods.

**Ethics and dissemination** The review does not require ethics approval. Findings will be disseminated at conferences, in a peer-reviewed journal and used to inform the development of an evidence-based tool for self-management of UI in older men.

## INTRODUCTION

The International Continence Society defines urinary incontinence (UI) as the complaint of any involuntary leakage of urine.<sup>1</sup> UI comes with huge costs to individuals, employers and the healthcare system in Canada, estimated at \$8.5 billion annually in 2014,<sup>2</sup> and \$65.9 billion in the USA in 2007.<sup>3</sup> For the

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ It will be one of the few papers to specifically focus on older men's risk factors for urinary incontinence (UI) by synthesising and mapping the evidence in a systematic and comprehensive manner.
- ⇒ Through the scoping review method, knowledge gaps in the literature will be identified regarding UI risk factors among older men.
- ⇒ To ensure an exhaustive search and to yield robust evidence from all sources, an extensive review of grey literature will supplement the conventional scientific database search.
- ⇒ The lack of age stratification in most data on men in general and the paucity of data specifically on older men with UI will pose limitations.
- ⇒ In accordance with the Joanna Briggs Institute's scoping review method, the review will not include a quality appraisal of individual sources of evidence, regardless of their level on the hierarchy of evidence.

majority of sufferers, UI is a chronic stigmatising condition that is under-reported and undertreated.<sup>2</sup> UI is under-prioritised and under-researched, particularly in older men (defined here as men 65+ years), and there have been calls for more targeted research focusing on this specific group.<sup>4,5</sup>

The prevalence of male UI is higher among older than younger men, reaching 30% compared with 10% and 16% in younger and middle-aged men from a Canadian Bladder survey.<sup>6</sup> In the USA, UI prevalence increases with age from 11% among men 60–64 years old to 31% among men 85 years and above.<sup>7</sup> International epidemiological data suggest that the prevalence of UI is 4.81%–32.17% among community-dwelling men and 21%–32% among older men.<sup>8</sup> The Sixth International Consultation on Incontinence notes that the epidemiology of male UI has received less attention compared with female UI, and that UI prevalence seems to rise more steadily with advancing age in men than in women.<sup>5</sup> The prevalence of urgency



© Author(s) (or their employer(s)) 2023. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

<sup>1</sup>Division of Geriatric Medicine, Faculty of Medicine & Dentistry, University of Alberta, Edmonton, Alberta, Canada

<sup>2</sup>John W. Scott Health Sciences Library, University of Alberta, Edmonton, Alberta, Canada

### Correspondence to

Dr Olawunmi Olagundoye; [olagundo@ualberta.ca](mailto:olagundo@ualberta.ca)

UI is similar in both men and women and increases in association with increasing age.<sup>9</sup>

Although the overall prevalence of UI in older men is about half that of older women,<sup>5</sup> the consequences of UI in older men are equally far-reaching, affecting their quality of life, levels of physical activity and economic productivity, posing significant physical, psychological, social, sexual and financial burdens.<sup>10</sup> Similar to the experiences of older women, UI in older men increases the risks of institutionalisation,<sup>8</sup> self-isolation and depression.<sup>2</sup>

Much of the limited research on male UI has focused on its prevalence<sup>6 8 11</sup> and associated risk factors in general.<sup>8 11 12</sup>

Most UI epidemiological studies have not systematically identified risk factors for UI in older men and have not sought to categorise them. Although age groups were not specified, the Sixth International Consultation on Incontinence documents some established risk factors predisposing men in general to UI including 'increasing age, presence of LUTS, urinary tract infections, functional and cognitive impairment, diabetes, alcohol intake, neurological disorders, and prostatectomy'.<sup>5</sup>

Given the financial burden of UI, an understanding of risk factors can inform cost-effective prevention and treatment programmes such as self-management; a promising and proven intervention for managing chronic conditions like UI.<sup>13</sup> Evidence about factors amenable to modification will allow the development of evidence-based interventions for self-management of UI in older men, a strategy found to be effective in older women.<sup>14 15</sup>

So far, self-management intervention packages for men have targeted uncomplicated lower urinary tract symptoms generally and mostly in men with prostate disease (benign prostatic hyperplasia/benign prostatic enlargement). These packages vary in their components, recommendations and outcomes.<sup>16–18</sup> The inconsistencies and heterogeneity of these recommendations, the lack of clarity as to what should constitute the optimal package of components for self-management, and the need to focus specifically on the population of older men with UI<sup>4</sup> necessitate a comprehensive mapping of the full breadth of evidence through a scoping review of risk factors for UI in older men.

As part of a larger study, this scoping review aims to synthesize evidence on risk factors as the starting point in the creation of a self-management intervention targeting older men. The findings from this scoping review will inform a formal process to define and prioritise risk factors amenable to self-management that older male patients find practicable and are potentially willing to modify.

The objective of this scoping review therefore is to identify risk factors for UI in older men.

We found no current or ongoing review on our topic after a preliminary search of MEDLINE, PubMed, the Cochrane Database of Systematic Reviews and *JBIEvidence Synthesis*. In addition, inquiries to subject matter experts at the 2022 International Continence Society's scientific

conference revealed that our topic was not currently under review.

## Review question

What are the risk factors for UI in older men?

## Eligibility criteria

### Participants

#### Inclusion criteria

All sources of evidence on UI risk factors that include older men (65+).

#### Exclusion criteria

Data derived solely from men under 65 years of age or exclusively from women will be excluded. We will exclude articles featuring combined datasets where it is impossible to extract the UI risk factors for older men due to a lack of age stratification. Similarly, where studies retrieved include information on both men and women, only data stratified by sex will be reported.

## Concepts

UI is a storage symptom of the lower urinary tract defined as the complaint of any involuntary loss/leakage of urine.<sup>1</sup> UI can be classified as reversible or established. Reversible UI has a treatable cause and is more common among hospitalised older patients, and residents in long-term care<sup>19</sup> while established UI is chronic, and it may not be possible to identify a reversible cause. The five major types of established UI are urgency, stress (exertional), overflow, functional (disability associated), and mixed UI.<sup>20</sup>

Risk factors are characteristics, conditions, behaviours or exposures that increase the likelihood of getting a disease or injury.<sup>21</sup> There are general risk factors that may apply to chronic diseases in general (tobacco use, alcohol consumption, physical inactivity, excess weight and poor nutrition)<sup>22</sup> as well as specific risk factors for UI. Generally, risk factors can be grouped into categories: *Behavioural risk factors* relate to the actions that individuals have chosen to take, and can be eliminated or modified through lifestyle or behavioural changes. Examples include tobacco smoking, excessive alcohol use, poor nutrition and physical inactivity.<sup>21</sup> *Physiological risk factors* are those relating to an individual's body. They may be influenced by an interaction of genetics, lifestyle and other broad factors. Examples include overweight or obesity, high blood pressure, high blood cholesterol and high blood sugar. *Demographic risk factors* relate to the overall population. Examples are age, occupation, religion or income. *Environmental risk factors* cover a wide range of topics such as social, economic, cultural, political, physical, chemical and biological factors. Examples include air pollution, workplace risks, access to clean water and sanitation, and social interactions. *Genetic risk factors* are based on an individual's genetic makeup. While some diseases are mainly genetic, others reflect an interaction between genetic and environmental factors.<sup>21</sup>

## Context

All settings for older men with UI.

## Types of sources

All study designs will be included in this scoping review without restriction. It will consider published and unpublished sources. Text, opinion papers and other grey literature will also be considered for inclusion.<sup>23</sup>

## METHODS AND ANALYSIS

We will conduct our scoping review following the Joanna Briggs Institute (JBI) method for scoping review,<sup>23</sup> and in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR) checklist.<sup>24</sup> JBI's scoping review protocol template, aligned with the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols checklist (online supplemental file 1), was used in the formatting of this protocol.

## Search strategy

The search strategy will aim to locate both published and unpublished studies. A medical librarian (JYK) performed an initial search of MEDLINE on 24 May 2022, to identify articles on the topic. The text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles were used to develop a full search strategy for Ovid MEDLINE (online supplemental appendix I). The search strategy, including all identified keywords and index terms, will be adapted for each included database or information source. It will be reviewed by other members of the research team and if necessary, by a second librarian using the Peer Review of Electronic Search Strategies guideline.<sup>25</sup> The search strategy will be updated 6 months after it was originally run, and prior to submission for publication, the search will be updated to reflect newly published studies since the original run.

Studies published in any language will be included. We will compare translations from two validated online language translators; DeepL translator and Google translator (<https://www.deepl.com/en/translator> and <https://translate.google.com/>) for languages other than English (LOTE) and double-check with colleagues who are known native speakers of the LOTE when necessary. Relevant studies published since the inception of the databases to date will be included. In addition to subscription databases, the research team will review the first 200 results from Google Scholar for inclusion. This is a reasonable number of results to screen since there is a high overlap between Web of Science and Google Scholar.<sup>26</sup> The reference list of all included sources of evidence will be screened for additional studies.

The databases to be searched are Ovid MEDLINE, Ovid Embase, CINAHL, Scopus, Web of Science Core Collection, Cochrane Library (via Wiley) and ProQuest Dissertations & Theses Global. Additionally, grey literature will

be reviewed. Grey literature consists of unpublished literature, including publicly available information produced by all levels of government, academic institutions, professional societies, business and industry, in print and electronic formats, which is not controlled by commercial publishers.<sup>27</sup> We will use general and targeted internet searches for the electronic formats of these documents. General searches will involve the use of Google, while targeted searches will examine the websites of national and international organisations addressing the subject matter.

## Study/source of evidence selection

All identified citations from the search will be collated and uploaded into Covidence (Veritas Health Innovation, Melbourne); a web-based collaboration software platform that streamlines the production of systematic and other literature reviews.<sup>28</sup> After automatic removal of duplicates, two reviewers will independently screen titles and abstracts of a random sample of 5% of studies identified with our literature search. They will discuss the results and review the eligibility criteria as needed. We will check the inter-reviewer agreement for inclusion or exclusion between these reviewers using the kappa statistics.<sup>29</sup> A Cohen's kappa coefficient ( $\kappa$  value) of 0.41–0.60 indicates moderate agreement, 0.61–0.80 indicates substantial agreement and 0.81–1.00 is almost perfect agreement.<sup>29</sup>  $\kappa$  value >0.61 will be considered sufficient to proceed.

Potential reasons for exclusion will be defined a priori, categorised, recorded and reported in the scoping review. The full text of included citations will then be assessed in detail against the inclusion criteria by two independent reviewers. Any disagreements that arise during the selection process will be resolved through discussion and consensus between reviewers, and if needed, with a third party.<sup>23</sup> The results of the search and the study inclusion process will be reported in full and presented in a PRISMA-ScR flow diagram.<sup>24</sup>

## Data extraction

Data will be extracted from papers using a data extraction tool based on JBI's data extraction form template (online supplemental appendix II).<sup>30</sup> The data extracted will include specific details about the country, authors, participants, concept, context, study methods and key findings relevant to the review question.

Two reviewers will pilot test the draft extraction form through a calibration exercise to guide the selection of evidence sources to ensure the form captures all relevant data. They will then extract data independently from included studies into the draft. The draft data extraction tool will be modified and revised as necessary. Any modifications will be detailed in the scoping review. Any disagreements that arise between the reviewers will be resolved through discussion, or with an additional reviewer. If appropriate, authors of papers will be contacted to request missing or additional data where required.

## Risk of bias

In accordance with JBI method for scoping reviews, no quality appraisal will be conducted.<sup>23</sup> Rather than engaging in formal quality assessments, we will assign a level of evidence rating to each study based on JBI's well-established categorisation of studies.

## Data analysis and presentation

We will summarise data quantitatively (using frequencies) and qualitatively (using the descriptive-analytical method). If possible, we will stratify results by the economic status of the country (eg, low-income, middle-income or high-income country), ethnicity/race and health context (eg, primary, secondary and tertiary care). Data will be presented in diagrammatic or tabular form. A narrative summary will accompany the tables and charts and will describe how the results relate to the review objective and question. Our results will be reported using the PRISMA-ScR checklist.

## Patient and public involvement

It might not be appropriate or possible to involve patients or the public in the design, conduct, reporting and dissemination plans of our review. However, a patient advisory group will be involved in translating evidence from the review into cocreating a patient-centred tool for self-management of UI in the context of a larger study.

## ETHICS AND DISSEMINATION

The review does not require ethics approval. Findings will be disseminated through presentations at conferences/workshops, peer-reviewed publication, health blogs and other social media platforms such as LinkedIn, Twitter, and Instagram.

**Twitter** Olawunmi Olagundoye @OlaOlagundoye, Janice Y Kung @janicekung, William Gibson @drbillgibson and Adrian Wagg @adrianwagg

**Acknowledgements** This review contributes towards a PhD degree award for OO.

**Contributors** OO and AW contributed to the conceptualisation, design, literature search, manuscript writing and manuscript editing. JYK developed the search strategy, conducted the searches and contributed to manuscript writing. WG contributed to the literature search, manuscript review and editing. All authors approved the final manuscript.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Not applicable.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Supplemental material** This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines,

terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

## ORCID iDs

Olawunmi Olagundoye <http://orcid.org/0000-0002-1697-1720>

William Gibson <http://orcid.org/0000-0002-3481-6484>

## REFERENCES

- 1 D'Ancona C, Haylen B, Oelke M, *et al*. The International continence Society (ICS) report on the terminology for adult male lower urinary tract and pelvic floor symptoms and dysfunction. *Neurourol Urodyn* 2019;38:433–77.
- 2 The Canadian Continence Foundation. The impact of incontinence in Canada. A briefing document for policy makers. 2014. Available: <https://www.canadiancontinence.ca/pdfs/en-impact-of-incontinence-in-canada-2014.pdf>
- 3 Coyne KS, Wein A, Nicholson S, *et al*. Economic burden of urgency urinary incontinence in the United States: a systematic review. *J Manag Care Pharm* 2014;20:130–40.
- 4 Wagg A. Male overactive bladder: underappreciated, under-researched. more please? *Eur Urol* 2021;79:505–6.
- 5 Abrams P, Cardozo L, Wagg A, *et al*. *Incontinence*. Bristol UK: ICI-ICS. International Continence Society, 2017: 35–6.
- 6 Herschorn S, Gajewski J, Schulz J, *et al*. A population-based study of urinary symptoms and incontinence: the Canadian urinary bladder survey. *BJU Int* 2008;101:52–8.
- 7 Anger JT, Saigal CS, Stothers L, *et al*. The prevalence of urinary incontinence among community dwelling men: results from the National health and nutrition examination survey. *Journal of Urology* 2006;176:2103–8.
- 8 Shamliyan TA, Wyman JF, Ping R, *et al*. Male urinary incontinence: prevalence, risk factors, and preventive interventions. *Rev Urol* 2009;11:145–65.
- 9 Irwin DE, Milsom I, Hunskaar S, *et al*. Population-Based survey of urinary incontinence, overactive bladder, and other lower urinary tract symptoms in five countries: results of the EPIC study. *Eur Urol* 2006;50:1306–14.
- 10 Chung E, Katz DJ, Love C. Adult male stress and urge urinary incontinence—a review of pathophysiology and treatment strategies for voiding dysfunction in men. *Aust Fam Physician* 2017;46:661–6.
- 11 Abrams P, Cardozo L, Khoury S, *et al*, eds. *Incontinence [internet]*. 2013. Available: [https://www.ics.org/Publications/ICI\\_5/INCONTINENCE.pdf](https://www.ics.org/Publications/ICI_5/INCONTINENCE.pdf)
- 12 Fernández-Cuadros ME, Nieto-Blasco J, Geanini-Yagüez A, *et al*. Male urinary incontinence: associated risk factors and electromyography biofeedback results in quality of life. *Am J Mens Health* 2016;10:127–35.
- 13 Grady PA, Gough LL. Self-Management: a comprehensive approach to management of chronic conditions. *Am J Public Health* 2014;104:e25–31.
- 14 Tannenbaum C, van den Heuvel E, Fritel X, *et al*. Continence across continents to upend stigma and dependency (CACTUS-D): study protocol for a cluster randomized controlled trial. *Trials* 2015;16:565.
- 15 Holroyd-Leduc JM, Straus S, Thorpe K, *et al*. Translation of evidence into a self-management tool for use by women with urinary incontinence. *Age Ageing* 2011;40:227–33.
- 16 Albarqouni L, Sanders S, Clark J, *et al*. Self-Management for men with lower urinary tract symptoms: a systematic review and meta-analysis. *Ann Fam Med* 2021;19:157–67.
- 17 Brown CT, Yap T, Cromwell DA, *et al*. Self management for men with lower urinary tract symptoms: randomised controlled trial. *BMJ* 2007;334:25.
- 18 Brown CT, van der Meulen J, Mundy AR, *et al*. Defining the components of a self-management programme for men with uncomplicated lower urinary tract symptoms: a consensus approach. *Eur Urol* 2004;46:254–62.
- 19 Shah D, Badlani G. Treatment of overactive bladder and incontinence in the elderly. *Rev Urol* 2002;4(Suppl 4):S38–43.
- 20 Abrams P, Cardozo L, Fall M, *et al*. The standardisation of terminology of lower urinary tract function: report from the

- standardisation Sub-committee of the International continence Society. *NeuroUrol Urodyn* 2002;21:167–78.
- 21 EUPATI Open Classroom. Risk factors in health and disease [internet]. n.d. Available: <https://learning.eupati.eu/mod/book/view.php?id=215>
  - 22 Cancer care ontario, prevention and cancer control (population health and prevention). modifiable risk factors [Internet]. n.d. Available: <https://www.cancercareontario.ca/en/data-research/view-data/modifiable-risk-factors>
  - 23 Peters M, Godfrey C, Mclnerney P, et al. Chapter 11: scoping reviews. In: Aromataris E, Munn Z, eds. *JBI Manual for Evidence Synthesis* [Internet]. JBI, 2020. Available: <https://wiki.jbi.global/display/MANUAL/Chapter+11+%3A+Scoping+reviews>
  - 24 Tricco AC, Lillie E, Zarin W, et al. PRISMA extension for scoping reviews (PRISMA-scr): checklist and explanation. *Ann Intern Med* 2018;169:467–73.
  - 25 McGowan J, Sampson M, Salzwedel DM, et al. Press peer review of electronic search strategies: 2015 guideline statement. *J Clin Epidemiol* 2016;75:40–6.
  - 26 Haddaway NR, Collins AM, Coughlin D, et al. The role of Google scholar in evidence reviews and its applicability to grey literature searching. *PLOS ONE* 2015;10:e0138237.
  - 27 Work on Grey in Progress. 6th international conference on grey literature [internet]. textrelease; amsterdam. 2004. Available: [http://greyguide.isti.cnr.it/attachments/category/30/GL6\\_Conference\\_Proceedings.pdf](http://greyguide.isti.cnr.it/attachments/category/30/GL6_Conference_Proceedings.pdf)
  - 28 Covidence systematic review software [Internet]. Melbourne, Australia: Veritas Health Innovation. n.d. Available: [www.covidence.org](http://www.covidence.org)
  - 29 McHugh ML. Interrater reliability: the kappa statistic. *Biochem Med* 2012;22:276–82.
  - 30 JBI data extraction form for review for systematic reviews and research syntheses [Internet]. *BMJ Open* 2022. Available: <https://bmjopen.bmj.com/content/bmjopen/9/7/e029811/DC3/embed/inline-supplementary-material-3.pdf?download=true>