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Title: Association between chronic conditions and urinary incontinence in women: A population-based cross-sectional analysis

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REVIEWER 1: *Dr. Hay-Smith EJ, University of Otago*

Comment 45: This paper reports a cross-sectional analysis of a large, population-based, dataset to examine the association between several common chronic conditions and urinary incontinence (types - stress, mixed, urgency) in Canadian women aged 25 and over. I used the STROBE checklist as the basis of peer review of the research report. The paper is written clearly, fluently and succinctly. Thank you - it was a pleasure to review.
Response: Thank you very much for taking the time to review our work.

I have the following suggestions for minor revision:
Comment 46: 1. Iterate the main features of study design at the start of the methods, before the data source and sample subheading (STROBE item 4).
Response: We have now articulated that this was a cross-sectional study at the beginning of the Methods (Study Design and Data Source subsection).

Comment 47: Consider additional information about some variables in the methods - why 25 years and over, state parity not available in the data set, reference the 'cut offs' for the BMI categories (STROBE items 6, 7, 8).
Response: UI was only measured in CCHS respondents aged 25 and older; this detail has been added to the Methods (Analytic Sample subsection). We have clarified in the Methods (Covariates subsection) that data on parity and other aspects of obstetrical history are not routinely collected in the CCHS and were thus unavailable. BMI was delineated according to well-established and international groupings for adults from the World Health Organization, and these cut-offs have been added to the Methods (Covariates subsection).

Comment 48: Consider minor changes to discussion. First, chronic cough and other mechanisms that increase intra-abdominal pressure have consequences for fascia and as well as muscle, thus contributing to UI mechanisms.
Response: We acknowledge that the matter of intra-abdominal pressure is more than a striated muscle mechanism and have now referenced the implications for connective tissue as well.

Comment 49: Second, revise this phrase on page 7 "changing positions to prevent incontinence are thought to explain UI in women with arthritis" as I am not clear how changing positions contributes to UI.
Response: Thank you for drawing this to our attention; we have removed this clause to focus more broadly on the possibility of mobility issues impacting UI in women with arthritis.

Comment 50: Third, add weight to your interpretation/recommendations about help-seeking (from bottom of p7) by citing some of the qualitative evidence that consistently demonstrates many women wait for/expect/want a health professional to ask/initiate the conversation.
Response: Thank you for this suggestion. We have added reference to a meta-ethnography that highlights women's desire for conversations about UI to be initiated by the health care provider due to the stigma associated with self-initiated disclosure.

REVIEWER 2 *(Dr. Adrian Wagg)*

Association between chronic conditions and urinary incontinence in women: A population-based cross-sectional analysis. This study examined the associations between chronic medical conditions and incontinence in adult women using the Canadian community health survey from 2013 to 14

Comment 51: Abstract: this is a well written, fair summary of the paper with well qualified conclusions based upon the results
Response: Thank you.

Comment 52: Introduction - Urge urinary incontinence should now be referred to as urgency urinary incontinence given that urge is a physiological, rather than a pathological, symptom. Additionally, subdividing the entirety of pathology underlying a urinary incontinence into these three subtypes is somewhat over simple. Perhaps the authors might add in something about fee other orbit minor underlying causes for incontinence whereas the authors suggest that "mild" UI may worsen over time and support their contention by noting a delay in treatment seeking and that women with more severe symptoms seek help – they may have conflated two arguments – there are a lack of good longitudinal studies which associated worsening of UI with time – although altering physiology may make this more likely – it is also possible that the woman has associated conditions (or other external factor) which alter the impact of the UI – hence the transition to healthcare seeking for the condition. The comorbid conditions may have a direct impact on the likelihood of successful toileting in an accumulated deficits model
Response: We acknowledge our use of the more colloquial label "urge" UI and have corrected this to "urgency". We agree that the reduction of UI to three subtypes is a simplification; it is the approach often used with an interdisciplinary audience who are not content experts on UI. We have reworded the first paragraph of the Introduction to better reflect the complexity of classifying UI and the nuances of UI which can have multiple co-existing subtypes and symptoms. This comment is further addressed by the change of reference to the IUGA/ICS joint report on terminology (see comment #6). We also now mention the role of aging and accumulation of comorbidities as part of the help-seeking process in the first paragraph of the Introduction

Comment 53: The authors should also note that, as in the ICI guidelines, treatment of conditions which have an impact on continence status should also be optimized – such as COPD, OSA, obesity, conditions affecting mobility etc.
Response: We have added the ICI guidelines as a reference in the Interpretation.

Comment 54: The authors should also note that OAB -wet appears to be accompanied by an increased comorbid load compared to people without OAB (Waldman & Milsom, I think) – there are data from community dwelling and institutionalised samples, and likewise with an increased association with impairment in ADL
Response: We have added a sentence to the second paragraph of the Introduction to emphasize the disproportionately higher comorbid load and experience of functional limitations in women living with UI. Thank you for this suggestion as it strengthens the importance of female UI as a community and public health issue.

Comment 55: The research question is well articulated
Response: Thank you.

Comment 56: Method: please could the authors define the UI questions in the survey? Were these validated?
Response: We have clarified in the Methods (Exposure and Outcome Variables subsection) that respondents were asked a single question about presence of UI (yes or no) that has been diagnosed by a health professional or expected to last or has already lasted 6 months or more. While this question does not map to a specific validated questionnaire and does not measure the type or severity of UI (as noted in our Interpretation Limitations subsection), self-report is a widely used approach to measuring UI in public health and women's health research,[18–20] particularly when clinical or

objective measurement of leakage is unavailable or infeasible.

Comment 57: The ethnicity categories are somewhat oversimplified, given what is known about ethnic variation in UI and UI subtype
Response: We agree that more granular information on respondent ethnicity would have been useful for this analysis. Unfortunately, the CCHS public use files only contain ethnicity as a binary variable classifying respondents as white or visible minority. This is to ensure that publicly available datasets are sufficiently anonymized to protect respondent confidentiality. We have added a sentence to acknowledge the lack of detailed ethnicity information in our Interpretation (Limitations subsection).

Comment 58: Mode of childbirth was, I assume missing – we know from Canadian data, for example, that forceps delivery has an increased association for UI
Response: We have clarified in the Methods (Covariates subsection) that data on parity and other aspects of obstetrical history including previous mode of delivery were not available, as it is not routinely collected in the CCHS

Comment 59: Results - Re –"Women with a chronic condition were less likely to have postsecondary education" also true adjusted for age – older cohorts may have fewer years in education in any population given societal changes. Otherwise, the results are comprehensive, and the combination of text and tables is excellent
Response: Analysis of demographic characteristic differences by chronic condition status adjusted for age was beyond the scope of our descriptive analysis, though we agree that educational differences would hold in an age-adjusted context. In recognizing secular trends in education access and workforce participation for women, we included both education and age as covariates in our regression modelling.

Comment 60: Discussion - The discussion is well written with a reasonable attempt at explaining the underlying mechanisms of association of the identified chronic conditions and UI – some of the association between medications and UI may of course have been missed by the data but the authors have made a rigorous attempt at controlling for missing data and confounders
Response: Thank you very much – we appreciate your time and consideration of our work.

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