

Dear Recommender and Reviewers,

We would like to express our sincere gratitude for your thorough assessment of our manuscript, and for your constructive suggestions to enhance its content. We believe that the revisions we have made have significantly improved the manuscript.

In the table below, we have detailed our responses to each of your questions, comments, and requests for revision. We hope that our changes meet your expectations and address your concerns.

Thank you for considering our revised manuscript for publication in PCI Health and Movement Sciences.

### Reviewer 1

| Comments from reviewer  | Response from authors   |
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| <p>Introduction</p> <p>It would be helpful to see a definition/description of insufficient, adequate, and excessive GWG. I know that guidelines/definitions vary, but indicating the IOM 1990 and IOM 2009 guidelines (as they were the most commonly used) in the Introduction would be useful.</p>  | <p>The IOM definition has been added to the Introduction (p. 6).</p>  |
| <p>Introduction</p> <p>The authors cite three existing reviews of structural vulnerability factors and gestational weight gain, but provide little to no information regarding the conclusions of these reviews. Personally, I would like to see more details on the key results highlighted in these reviews and the authors' conclusions to better help to contextualize the importance of the current review, and also a return to these points in the Discussion - with a focus on similarities and differences - to help to put the results of the current review into a broader perspective.</p> <p>Minor revision: Line 116, "There was no restriction on the publication year of articles." To clarify or remove, given that articles</p> | <p>The reviews are more thoroughly described and the gaps in the literature more clearly highlighted in the Introduction. Similar changes were made in the Discussion section (p. 7-8, 22, 27-28).</p> <p>This sentence has been removed.</p> |

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| <p>published after 2019 are specifically excluded.</p>   |  |
| <p>Results</p> <p>The results would be much more informative if the authors integrated a synthesis of key results summarizing – in general – which groups have higher risk for insufficient and excessive gestational weight gain for each of the structural vulnerability factors assessed. This would provide a richer context for the interpretation of the results presented in detail in the tables. I understand that there is a lot of variability in results, but the authors are the best positioned to evaluate the general trends and to draw some summary conclusions to help contextualize for the reader.</p>  | <p>We have integrated a summary table (pp. 15-16) summarizing the extent, range, and nature of the literature in the results section. We also define what we mean by ‘extent, range, and nature’ (p. 8). Due to the high heterogeneity in SVF measurements, study designs, and findings, and because this was somewhat out of scope of our review, we did not identify which groups were at higher or lower risk of GWG outside the recommended range in the summary table or in the text. This information can be found in the supplementary material for each study.</p>   |
| <p>Results</p> <p>Race &amp; Ethnicity: "One of the least studied groups was Indigenous women." It would be helpful to have more details here. It's an important point, and merits contextualization. I'm curious because the reasons explaining the lack of studies among Indigenous women could highlight areas for future research. Is it that data for Indigenous participants are not collected, are not represented in analyses, are grouped with other racial or ethnic groups? For example (as the authors note), in the study by Headen et al. 2018, the “white” ethnicity group includes all other non-Black, non-Latino women in the sample, including those classified as Indian and Native American. So data are available, but not presented. If this is an important point for future research, providing more details to contextualize how many studies actually present results for Indigenous women, and some of the reasons why others do not, would be a priority.</p> | <p>The following sentences were added to the discussion (pp. 24-25): <i>“The choice of categories may not only affect the observed relationship between the SVF and GWG, but also influences the representation of smaller or more marginalized groups of women, particularly in the case of race/ethnicity. For instance, the relationship between Indigeneity and GWG was not prominently reported in the studies included in our review. Indigenous women were often either excluded from studies (e.g., Cavicchia et al., (32)), or were grouped in with other racial/ethnic groups (e.g., Headen et al., (33)). These systematic differences in definitions, categorization, and representation inevitably compromise the ability to generate clear comparisons between studies and subsequently to determine the association between each SVF and GWG.”</i></p> <p>The words “effect” and “impact” were changed for “association between” or</p> |

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| <p>Results</p> <p>I suggest reviewing to avoid causal language. For example, "Thirty-nine studies (25%) examined the effect of income on GWG..." There are a few other similar phrases in the Results and Discussion.</p>  | <p>"influence" in several sentences of the manuscript.</p>   |
| <p>Discussion</p> <p>I appreciated the discussion of intersecting vulnerability factors and the example of Huynh et al. regarding ethnicity, education, and socioeconomic status. I would love to see more context on studies that applied an intersectional approach. The importance of intersectionality is so heavily emphasized in research on structural vulnerability factors but it's a framework that's often hard to apply in practice. Adding a section to describe articles that successfully integrated intersectionality into their analyses or interpretation could provide examples for other research teams to follow.</p> | <p>While respecting the scope of our study, we have substantially improved the section on intersectionality and added concrete examples (pp. 25-26).</p>   |
| <p>Discussion</p> <p>As noted above, returning to the three existing reviews would help to enrich the Discussion. For example, regarding considerations for future research: to what extent are suggestions similar or different among reviews?</p>  | <p>A new section (p.22) "<i>Comparison with previous findings</i>" has been added to the discussion and considerations for future research are more precise in the conclusion of the manuscript (p.28-29).</p> |

**Reviewer 2**

| <p><b>Comments from reviewer</b></p>   | <p><b>Response from authors</b></p>  |
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| <p>Title</p> <p>I feel the title isn't coherent with the study aim or results. Authors did not set out to evaluate the degree of influence of SVFs on GWG. Furthermore, it is not clear to me that they assessed the</p> | <p>The title has been changed to: "<b>Structural Vulnerability Factors <u>Influence-and</u> Gestational Weight Gain <u>in-a Broad Range of Contexts: A Scoping Review on the Extent, Range and Nature of the Literature</u></b>"</p> |

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| <p>range of contexts in which this association occurs. I would recommend reformulating the title to more closely represent the overarching goal to document the extent, range and nature of reviewed studies.</p>  |  |
| <p>Abstract</p> <p>The abstract presents clear rationale and methods. It is not entirely clear to me how authors envisage this review will inform future methodological approaches (to research or to intervention). Given the study objectives, I feel informing future research is more appropriate.</p> <p>Some results are reported in total number (n) and some with proportion (%). A standardized reporting could be useful to readers. The last sentence of the abstract (conclusion) overreaches this study’s scope, in my opinion, and should be reworded.</p> <p>Line 30: I believe the sentence should read, “were affected by one OR more...”</p> | <p>The end of the sentence with the aim and the conclusion of the abstract have been modified for the following:</p> <p><i>“The aim of this scoping review was to identify key structural vulnerability factors (SVFs) related to GWG, and to examine the extent, range, and nature of the existing literature to inform future research.”</i> (p. 4)</p> <p>Conclusion of the abstract: <i>“Given the heterogeneity in findings across studies, adopting an intersectional approach may enhance our understanding of the complex interplay between SVFs and the social context in relation to GWG. This nuanced perspective is critical for informing future research and developing effective strategies to address the pervasive perinatal health challenges associated with inadequate and excessive GWG.”</i> (pp. 4-5)</p> <p>We have updated the results throughout the manuscript to present both n and %, where appropriate.</p> <p>This sentence is no longer in the abstract.</p> |
| <p>Introduction</p>  |  |

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| <p>I appreciate that authors provided a definition of SVFs. Given the complexity of how an individual variable such as age interplays with “socioeconomic, political and cultural/normative hierarchies (13)” for it to be considered structural rather than purely individual (biological), I think an example specifically related to GWG would be helpful.</p>  | <p>The following example was added in the methods section (p. 9).</p> <p><i>“Additionally, age is understood as an SVF, rather than merely a biological factor, as age-related stigma—particularly for pregnant adolescents—along with social policies that overlook age, can increase health risks associated with pregnancy (21).”</i></p>   |
| <p>Introduction</p> <p>At lines 56 and 76 as well as elsewhere in the discussions and conclusions, authors state their review exposes, “the intricate intersectionality of vulnerability factors.” I am not in full agreement with this statement given the methods used to analyze study data. In my opinion, because such an analysis was not carried out in this study, the interpretation of study results can but suggest a deeper analysis is needed, as authors state in the discussion. Given the gap between the results (study descriptions) and the interpretations that were drawn from them (potential intersectional ties between SVF and GWG), I would need a better understanding of “the stated overarching study goal” (line 81). What exactly is meant by respectively “extent, range and nature”</p> | <p>These words were removed from the Introduction and the discussion was modified.</p> <p>As requested by review 1, we have improved the section on intersectionality in the discussion of the manuscript.</p> <p>The extent, range, and nature are now described in the last paragraph of the Introduction as follows (p. 8) : <i>“Our review aimed to identify key structural vulnerability factors (SVFs) associated with GWG and explore the extent (volume of literature, countries and years of publication), range (variety of factors covered), and nature (study design and characteristics of assessed populations) of this body of research.”</i></p> |
| <p>Introduction</p> <p>More generally, it seems the study goal, aim and objectives are stated in the second and third paragraphs. It could be</p>  | <p>The Introduction has been streamlined as suggested by the reviewer.</p>   |

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| <p>worthwhile to streamline limits in existing literature and current study objectives in the last paragraph of this section.</p>   |   |
| <p>Introduction</p> <p>Line 41: Abstract reads insufficient then excessive gestational weight gain, here extremes are inverted, standardizing their presentation throughout the manuscript could increase readability</p> <p>Line 42 epidemiological health concernS</p> <p>Line 43: “GWG is notably higher in USA and Europe” perhaps consider expanding lightly = as opposed to other high-income countries such as...</p> <p>Line 48: “greater risk of mortality” for carrier and child</p> <p>Line 62: “Bourgeois” not spelled the same as in References</p> <p>Lines 67 to 79 high use of the word “only”. I see authors are highlighting a limit in existing literature. Perhaps it would be best to state that gap more explicitly and follow up with the study objectives the need to fill this gap</p> | <p>The order of “insufficient” and “excessive” was standardized throughout the manuscript.</p> <p>The correction was made.</p> <p>This sentence was modified as follows (p. 6): “<i>The prevalence of excessive GWG (47%) is notably higher than inadequate GWG (23%), as estimated among pregnant women across the United States, Europe, and Asia (2).</i>”</p> <p>This sentence starts with “<b>In women</b>, insufficient GWG is associated with gestational diabetes mellitus and <b>greater risk of mortality</b> (5,11),” so it does not apply to children. The following part of the sentence specifies this outcome for the offspring as follows: “while in the offspring...increased risk of perinatal death.”</p> <p>The spelling was corrected to Bourgeois.</p> <p>This paragraph has been changed substantially. The word ‘only’ is not used anymore (pp. 7-8).</p> <p>A space was added.</p> |

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| <p>Line 73: space needed between scope and (16)</p> <p>Line 77: “This approach enhances the interpretation of results...”: according to whom?</p>   | <p>This part of the sentence was removed.</p>   |
| <p>Methods</p> <p>I applaud the effort invested in building a valid and reliable search string as well as analysis strategy. Given that this study aims to explain intricate intersectional interfaces between SVF and GWG, it could be wise to expose the authors’ positionalities (are they women, mothers, trained in such searches) and to reflect on how they could have influenced search string selection as well as data analysis and interpretation in the strengths and limits section.</p> | <p>While we respect the reviewer’s comment, we feel that it is not necessary for this review.</p>   |
| <p>Methods</p> <p>Line 113: the rationale behind high-income country selection would be useful here.</p> <p>Line 114: please provide a Reference for the World Bank 2018 high-income country list</p> <p>Line 119: I would like more details on the information specialist, which of the authors does this refer to? Please specify in the Authors’ contributions</p>   | <p>The following sentence was added to the inclusion criteria section: “We limited our analysis to studies conducted in high-income countries to minimize variability arising from different social, cultural, and political contexts”. (p. 10)</p> <p>A reference was added.</p> <p>The title page (p. 2) specifies that Karine Fournier, MSc, is a Research Librarian at the University of Ottawa.</p> <p>In the search strategy section, we added the following: “<i>Electronic searches were performed by an information specialist (coauthor KF) from inception of databases up to...</i>” (p. 11)</p> |

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| <p>Lines 144–145: Please detail what is meant by “Discrepancies among reviewers were resolved by the lead researcher”</p> <p>Line 178: space between (12) and Other</p> <p>Lines 177 to 180: these appear to be results (nature of studies, perhaps).</p>  | <p>Authors’ contribution section states (P. 29): ‘KF <u>designed and performed</u> the literature search’.</p> <p>The following sentence has also been added to the strengths of the scoping review (discussion section, p. 27): <u>“SVFs were developed based on Bourgois’ structural vulnerability framework, and the keywords and search strategy were thoroughly developed by a university librarian (KF) in collaboration with our multidisciplinary research team.”</u></p> <p>These two sentences were modified to clarify the meaning (p. 11-12): <i>“Initially, all citations underwent title and abstract screening, followed by full-text screening of relevant articles, which was conducted independently by two reviewers at both stages of the process. Discrepancies related to the inclusion and exclusion of articles among reviewers were resolved by the lead researcher in consultation with the reviewers.” More information on the review process can be found in this website: <a href="http://www.covidence.org">www.covidence.org</a>.”</i></p> <p>A space was added.</p> <p>The sentence below was moved to the results section (p. 14).<br/> <i>“The IOM 2009 guidelines (12) were the most commonly used, followed by the IOM 1990 guidelines (30). Other guidelines, such as those determined by a country’s health department, were used in a small segment of studies.”</i></p> |
| <p>Results</p> <p>In keeping with the overarching goals of this study, results should address 1) what are the key SVFs related to GWG?; and 2) what is the extent, range and nature of existing research on this topic? The results present a large corpus of data in detail. It would be most helpful to provide an overview in table or figure</p> | <p>A new summary table has been added and information moved from the discussion to the results section (p. 15-16).</p>  |



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| <p>format presenting for each SVF: how many studies, how many countries (and where), were results primarily S or N.S.</p>  |   |
| <p>Results</p> <p>It is not clear to me why some results are reported as sum total (n) and some as proportion (%). It could be useful to systematically provide proportions for greater readability.</p> <p>For the age section, I found it of note that some studies focused specifically on teens (as young as 14. To me, this is more relevant to report than the result stated at line 231 (17 y.o. teens being considered as adults). Although, the fact that we highlight both these elements says a lot about how we high-income country inhabitants and researchers may perceive, study and interpret such data.</p> | <p>This was modified accordingly.</p> <p>The sentence was changed to (p. 17): <i>“The age ranges defining adolescence varied between studies, with some studies categorizing women up to the age of 16 as adolescents, while others considered those up to the age of 19 as adolescents.”</i></p> |
| <p>Results</p> <p>Line 213 “with <b>some</b> studies specifying both a woman’s <b>ethnic</b> group and their...” a specific number would be most helpful here, given that authors state this study aims to expose intersectional interplay.</p>  | <p>The sentence was changed to (p. 17): <i>“The most studied racial or ethnic groups were White, Black, and Hispanic, with 31 studies (34%) specifying both a woman’s racial group and their Hispanic/non-Hispanic identity. One of the least represented groups was Indigenous women.”</i></p>   |
| <p>Discussion</p> <p>I believe the discussion could be vastly improved. The first paragraph presents a rather long summary of results that would in fact be better suited in the results section. Above I suggest presenting this information by</p>   | <p>Major modifications have been made to the discussion as proposed by the two reviewers, as detailed above and below.</p>  |

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| <p>way of a table or figure breaking down results by SVF.</p>   |  |
| <p>Discussion</p> <p>Discussion sub sections 1 and 2 should present how study findings line up with previous work. Presently, not a single study is referenced.</p> <p>Furthermore, authors could present insights as to how to address the variable reporting or meta-analyzing of such studies. Are there previously reported innovation review techniques that have been used or suggested that could be applied? In keeping with the overarching goals of this study, discussion should also address previous and present findings to answer the study research questions 1) what are the key SVFs related to GWG?; and 2) what is the extent, range and nature of existing research on this topic? It would be most interesting for authors to provide their interpretation (description) of the extent, range and nature of existing literature on the studied topic and to highlight similarities and differences between these interpretations and those documented in previous research. In their introduction, for example, authors refer to existing literature among more privileged groups of the high-income countries' population. How do their results converge or diverge from these groups? Authors also address previous reviews reporting on the topic among marginalized subgroups. How do</p> | <p>A section “1. Comparison with previous reviews” has been added (p. 22).</p> <p>Additionally, the discussion is now structured to better showcase the extent, range, and nature of the literature and compare/contrast with findings from previous reviews. See all the changes highlighted in yellow in the discussion and conclusion of the manuscript in pages 21-29.</p> |

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| <p>their own results confirm or infirm previous findings?</p>  |  |
| <p>Discussion</p> <p>I don't remember the authors addressing the majority of retrospective studies in discussing study nature. Could this methodological limit feasibly be addressed in future work? How do retrospective and prospective studies compare?</p>   | <p>This is now mentioned in the discussion and conclusion of the manuscript (p. 21, 23 and 29).</p> <p><b>Discussion:</b><br/> <i>“Most studies were conducted in the USA, used a retrospective design, and examined diverse populations in which a subgroup or the entire sample experienced one or more SVFs.”</i></p> <p><i>“Finally, most studies (60%) used a retrospective design, which comes with certain limitations, including a lack of control over data collection tools and methods, as well as potential biases related to the selection of participants, recall of information, and confounding factors (31).”</i></p> <p><b>Conclusion</b><br/> <i>“In light of this variability, and in line with O’Brien et al. (14), we suggest that future studies put an emphasis on prospective and objective measures of weight gain during pregnancy”</i></p> |
| <p>Discussion</p> <p>The latter part of the discussion (subsections 3 and 4) appears to span beyond the scope of the conducted review. I am not convinced that the reviewed studies allow to compare social contexts of vulnerability factors. Some studies report on small samples and others on whole populations. We could more easily compare, as authors suggest, within-country sub-populations, perhaps even whole populations. If the authors had applied an intersectional lens to data collection and analysis, a comparison of social contexts could potentially be feasible, but I don't currently see this in Methods and Results. In the</p> | <p>We have improved the clarity of the section on intersectionality, while staying within the scope of our review. Please see (section, pages 25-26)-.</p>   |

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| <p>manuscript’s current form, I understand subsection 4 as more of a study limit than an interpretation of results.</p>  |  |
| <p>Discussion</p> <p>I am very interested in the author’s interpretations of why there would be so many more <b>countries</b> not just <b>studies</b> looking at specific variables as opposed to others? Marital status, for example, was investigated in only 28 studies. They were conducted in USA, Belgium, Canada and Sweden. Why wouldn’t it have been studied more widely? Why would immigration status and abuse be even more rarely studied? These are sensitive issues touching on more highly politicized polemics. I wonder if study authors could address this as well as stigma in their discussion using previous work to expose how structural factors such as policies and social norms can affect GWG and thus health over a life course.</p> | <p>In response to the reviewer’s comment, we have added precision on the concepts of race/ethnicity, age and indigeneity (p. 9, 24-25), while staying within the scope of our review. Additional concerns raised by the reviewer regarding the focus of policies and social norms are addressed in the section on intersectionality of the discussion (pp. 25-26).</p> |
| <p>Discussion</p> <p>Concerning the Strengths and Limitations section, I consider the sample size and statistical methods used in the reviewed studies to be limits of the reviewed studies, outside of the author’s control and thus not respective to the present study reported in this manuscript (lines 422 to 429).</p> <p>I encourage the authors to reflect on how their own choices could have limited study breadth,</p>   | <p>We agree with the reviewer and have removed the sentence on sample size and statistical methods.</p> <p>Please refer to our other responses to the reviewer’s comment on the authors’ positionality and intersectional sensitivity.</p>   |

specificity, validity, etc. For example, though much effort and expertise were invested in developing the search string, it was informed by data subject to our own biases as researchers, biases that have been transferred to the algorithms that power our searches. Knowing the authors' positionality would be helpful, from an intersectional point of view, to assess whether their own perspectives could have affected their evaluation of which factors are important and what studies fit the selection criteria. To that point, authors state that such reviews contribute to exposing the intricate intersectionality of vulnerability factors, but I understand that the authors did not use an intersectional framework specific to GWG to analyze study data (perhaps such a tool has yet to be developed). I also understand that the final SVF list comprises the most documented factors, not necessarily the most impactful. Perhaps other indices would yield more informative data. Perhaps body image norms, sexual orientation, gender identity, health literacy, social mobility, social inequalities of health, relative general inequality, social discrimination, cultural integration of feminist/misogynist norms, or factors completely unbeknownst to researchers (especially given that women's health has been historically neglected). Perhaps more qualitative and participative research and more

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| attention to women’s health would prove to be useful as well.   |   |
| <p>Discussion</p> <p>Line 319: not clear to me if “and reported more significant associations” refers to all studies or specifically the ones conducted in the USA.</p> <p>Line 337: I believe a word is missing in this sentence “while most of the remaining <b>studies</b> relied...”</p> <p>Concerning the conclusion, I encourage the authors to review Lines 437 through 440 and Lines 446 to 448. These sentences span outside of what was assessed in the current study.</p> <p>Line 443: perhaps replace “toward weight gain” with GWG depending on intended meaning</p> | <p>This paragraph was removed and all information is now available in a summary table.</p> <p>Idem – the sentence was removed.</p> <p>Most of the conclusion of the manuscript was modified to stay within the scope of our review.</p> <p>This sentence was removed.</p> |
| <p>References</p> <p>References 14 and 15 do not appear in the right order in the list given that Campbell (2016) appears before O’Brien (2017) in the text.</p> <p>As for references 25 and 26 and the discussion section they were used in, I wonder if the authors could find sources pertaining more specifically to an intersectional approach to experiences of GWG.</p>  | <p>The correction has been made.</p> <p>New references are cited for the section on intersectionality (pp. 25-26).</p>  |
| <p>General comments</p> <p>The term “vulnerable populations” can imply the individuals themselves are the</p>   | <p>Although we recognize there is caution in applying this term, we refer to structural vulnerability to describe a wide</p>  |

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| <p>issue rather than the systems that vulnerabilize them. Perhaps the authors would consider the term “marginalized”.</p> <p>To contribute to destigmatize language both in and outside clinical settings at a time when the general public has increased access to research information, I wonder if other terms could be found to replace “in/adequate weight”,</p> <p>The use of the words “race” and “racial group” throughout the manuscript suggests that different races exist as opposed to one human race. Please review, perhaps, “Ethnic and cultural groups”</p> <p>The word “individuals” is used in the abstract and I believe the beginning of the introduction as opposed to the word women. If authors prefer to use inclusive language, I encourage standardizing using “individuals” throughout the manuscript (and look for the use of pronouns).</p> | <p>array of conditions. The terms are not used in relations to agency and social responsibility.</p> <p>We chose to use the words adopted by the IOM guidelines, which are inadequate and excessive GWG.</p> <p>We added the following two sentences to the Methods section (p. 9): <i>“For this review, race and ethnicity are understood as social constructs that are often employed as identifiers in research on health inequalities. These socially constructed categories have “true biological consequences through racism” (19). While both concepts are discussed together due to their overlapping meanings, we acknowledge their distinct significance in specific research contexts: ethnicity is often linked to a person’s cultural identity, whereas race generally refers to broad categories of people divided based on ancestral origins and physical characteristics (20).”</i></p> <p>Additionally, the IOM uses the terms “race or ethnicity” so we decided to use the same terminology.<br/> <a href="https://nap.nationalacademies.org/read/12584/chapter/4#34">https://nap.nationalacademies.org/read/12584/chapter/4#34</a></p> <p>While we respect the concern for inclusive language, unless the journal's editorial policy requires otherwise, we prefer to use the term "women" in this context. We believe that using "individual" or "person" may inadvertently diminish the specific experiences of women, who constitute the overwhelming majority of those who are pregnant. We removed the word “individuals” and replace it for “women” throughout the review.</p> |
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| <p>The authors use the term “Marital status” to describe a variety of statuses other than marriage. Perhaps “Civil status” would be a better alternative.</p> | <p>Marital status are the terms used by Statistics Canada so we prefer using language used by the governmental institutions.</p> <p><a href="https://www.statcan.gc.ca/en/subjects-start/families_households_and_marital_status">https://www.statcan.gc.ca/en/subjects-start/families_households_and_marital_status</a></p> |
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