Author's response to reviews

Title: Potentially inappropriate prescriptions (PIPs) for older patients in long-term care

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Author's response to reviews: see over
Dear Ms Borthwick,

Thank you for providing us the opportunity to revise our manuscript. We have very much appreciated the comments sent to us and have revised the manuscript accordingly.

I have attached a new version of this manuscript. I hope it will now be suitable for publication in BMC Geriatrics. See attached the point-by-point description of the changes made.

Sincerely,

Carol Rancourt, MSc

Attachments
Response to reviewers’ comments

Reviewer no 1

1. Make clear how our definition of PPI differs from others

This is an excellent suggestion. We are now addressing this issue in the introduction and discussion sections: “…However, in all these studies but one [7], criteria applied were a subset only of Beers criteria as dosage and duration was not evaluated… Assessing PIP using the data available in long-term care, in particular data on dosage and duration of use, may help designing efficient interventions to improve prescribing practices in one of the frailest populations … The current lack of consensus when defining lists of criteria and variations with respect to methodologies also contribute to the observed differences [26]. For example, Zhan and colleagues [5] estimated the proportion of potentially inappropriate medication use in the community-dwelling elderly in the United States. Applying criteria on the indication for the use of 33 drugs, they observed a prevalence of 21.3% for 1996… As we had access to dosage and duration information, we were able to apply a broader set of criteria which can explain the higher prevalence of PIPs we have observed.”

2. How our time-window of screening differs from others

This is a good point. During the 21-month study period, centers were visited once for charts review. The appropriateness of prescriptions was assessed for what it was the day data was collected. Therefore, our time-window was not 21 months but one day. We have clarified this point in the design section: “…Units were visited once during the study period. Data on drugs currently being prescribed the day of the visit was collected using medication charts.”

3. Are there 33 or 71 LTC facilities in Quebec City?

This point has been clarified in the design section: “…All long-term care facilities located in the Quebec City area were contacted and the majority (29 out of 33) agreed to participate in the study. Within the 29 participating facilities, there were a total of 71 long-term care units.”

4. “An initial univariate” should be “bivariate”

It has been changed as suggested.
Reviewer no 2

Major revisions

1. To see an additional set of analyses presenting the minimum possible extent of potentially inappropriate prescribing by assuming that all as-needed medications were not taken.

We have done this analysis. The proportion of residents with at least one PIP would be only slightly different, 46.4% as opposed to 51.5%. We have added this information in the results section: “...A total of 12,707 drugs were prescribed of which 1807 were given on an as-needed basis. The proportion of PIPs among scheduled and as-needed prescriptions were 9.2% and 11.5%, respectively. If we exclude as-needed prescriptions, 46.4% of all residents had one or more PIPs”.

2. Examine difference in prescribing among men and women. Data from figures 1 and 2 could be stratified according to sex (maybe in a table format).

We have added a new Table (Table 1) which displays gender differences in the prescribed therapeutic classes. Figure 1 has been withdrawn as the data is now presented in Table 1. We have also stratified by sex the data presented in the remaining figure (former Figure 2). We have added the following sentences in the results and discussion sections: “...There were differences in therapeutic classes prescribed to men and women... Although we observed gender differences in the prescribed therapeutic classes, female gender was not a predictor of PIPs in our study.”

Minor revisions

1. Rational for devising new criteria and comment on where theirs differ or not from existing criteria

It is now being discussed in the introduction: “…However, in all these studies but one [7], criteria applied were a subset only of Beers criteria as dosage and duration was not evaluated... Assessing PIP using the data available in long-term care, in particular data on dosage and duration of use, may help designing efficient interventions to improve prescribing practices in one of the frailest populations”.

2. The lower case “p” for probability values throughout.
It has been corrected

3. Refer to individuals as “residents” preferably to “subjects”.

Done

4. “1.76 times at greater risk of being prescribed”, not “more likely”.

It has been changed accordingly.

5. Calculate OR for each 5-year increment, or same age categories with the younger group as the reference group.

As suggested, we are now reporting the OR using age categories. See table 4.

6. “Using at least one drug”.

It has been corrected.

7. “Authors refer to “A positive association (not statistically significant) between length of stay…”

It has been changed for the following: “…Although the association between length of stay and the likelihood of receiving a PIP in nursing homes was studied in the past [6], to our knowledge, this is the first time it is being shown to be a predictor of PIPs”.

Discretionary revisions

1. Last sentence of the abstract, consider “identify” rather than “identifying”.

Done
Reviewer no 3

1. Explore the variation in rates of PIP

This is a very good suggestion. In the introduction, variation in rates of PIP is now being briefly discussed. More specifically, we have clarified how different are our criteria from those that have been used in prior research. We have added the following sentences: “…Prevalence estimates of PIPs are likely to vary with the criteria that are applied. Some authors have based their assessment on the Beers criteria [5-7, 9-12]. However, in all these studies but one [7], criteria applied were a subset only of Beers criteria as dosage and duration was not evaluated”.

2. Under the introduction ref 18 would state while a recent survey of 3,400 patients in general population (? In this Quebec)

Yes. It has been clarified.

3. Under methods, design and data sources: describe 71 long-term care units: unclear is this facilities or actual wards within facilities, need to describe the average beds in the 29 facilities.

a. It has been clarified: “…Within the 29 participating facilities, there were a total of 71 long-term care units. Numbers of beds in these units averaged 41 (10 to 190)”.

4. In this section as well, the authors comment that it “was assumed that all medications prescribed on as-needed basis were taken” is there any evidence to suggest that this is true? This could have inflated the findings considerably and is not the case in other provinces or states.

See our response to reviewer no 2 above. We are now presenting the results separately if we don’t include medications prescribed on as-needed basis. “…A total of 12,707 drugs were prescribed of which 1807 were given on an as-needed basis. The proportion of PIPs among scheduled and as-needed prescriptions were 9.2% and 11.5%, respectively. If we exclude as-needed prescriptions, 46.4% of all residents had one or more PIPs”.

5. Make a comment of 111 explicit criteria, should have a brief description, and how they fit in context of the literature, ie the number is high compared to other publications.

Criteria are described in appendix. See also our response above (point 1).

6. Under data analysis only controlled for patient variables and not facility variables, physician numbers etc
In the discussion, we are now acknowledging this limitation: “…Predictors of PIPs were assessed using a multivariate analysis. It allowed us to adjust for potential confounding variables. However, we were not able to adjust for facility variables as those were not available.”

7. Under the section potentially inappropriate prescribing, need to be consistent re use of PIP versus PIPs.

We have defined both PIP and PIPs so they both can be appropriately used throughout the manuscript.