Reviewer's report

Title: The effect of physical activity and body mass index on menopausal symptoms: a cross-sectional study in primary care

Version: 3 Date: 4 October 2013

Reviewer: Ellen Evans

Reviewer's report:

General Comments:

The public health implications of this work from a clinical perspective are recognized, that is finding alternative methods to alleviate menopausal symptoms that are not hormone therapy based. However, there is very little new information offered to the literature from this manuscript. In addition to the novelty, there are several major concerns if addressable, would strengthen this manuscript. It is the hope of this reviewer that the authors will receive these comments in the spirit in which they are offered – to improve the reporting of their work.

Major Complausible Revisions

1. Novelty: The influence of physical activity (PA)/exercise (EX) and BMI on menopausal symptoms has been investigated for over a decade. Although there are some aspects of the literature that are incompletely characterized, the research design and methodology used in this study will not assist the clarity within this literature.

2. Introduction: The introduction did not set up the purpose of the study very well. For example, an introductory sentence could have focused on the issue of symptoms in general before discussing PA effects on symptoms. The addition of the citation that PA/EX increased hot flashes is not developed which is critical as it reverse the direction from other content. Finally, there is a well-established relation between PA/EX and BMI with those that are more active having a lower weight status. The potential interaction of PA/EX and BMI on symptoms remains an important consideration. Additionally, PA is not the same as EX and intensity and mode are important considerations regarding their influence on symptoms. Note that the introduction could have also benefited from a hypothesis.

3. Statistical Analysis: The first concern is sample size. Although the sample size is robust, how was this study powered? Were there different enrollment targets for the peri-menopausal vs. the postmenopausal groups? The second concern is more important albeit it can be addressed as it relates to the statistical analyses. For the primary outcomes of interest, BMI and PA/EX, the authors manipulated continuous variables into a categorical variable which is often acceptable as a secondary analysis but not as a primary and sole analysis. The use of linear regression techniques would a) aid the interpretation of the data, b) allow the exploration of an interaction effect (e.g. BMI and PA) on the symptoms of
interest, and c) allow for control of important covariates such as age or menopausal status. The final concern is related to the expression of results in the text. For example, numerous times throughout the text it appears that linear regression or correlational analyses was used (which is not described in the statistical methods) with the use of expressions such as: “No significant relationships (p>0.05) were observed between BMI and all MRS subscales....”. If this is the case, the statistics section needs to be amended and the writing needs to be changed to reflect the strength of the association with the addition of an r value.

4. Co-morbidities. The handling of the chronic conditions requires additional explanation and likely analyses as some key conditions would influence menopausal symptoms differentially. For example, depression would likely influence psychological outcomes and osteoarthritis would influence reports of joint discomfort.

5. Discussion. The discussion could benefit from 1) a strong introductory paragraph stating the novel findings of the study, 2) a reduction in the content discussing cultural and eastern/western implications for descriptive data as this was not the focus of the study, 3) an increased focus discussion regarding the primary independent variables of interest for this study of PA/EX and BMI, and 4) an integrated discussion regarding the potential interactive effects of numerous outcomes on symptoms including not just PA/EX and BMI but also key demographic outcomes.

Minor Essential Revisions

1. Page 7. Although it is intuitive that greater severity of symptoms adversely influences quality of life, the MRS does not assess this construct. Suggest revising this sentence.

2. Page 7. The information regarding “the three levels of PA being proposed at the end” is confusing and not appropriate statistically (forced categorical data). See Statistical Analysis section above.

3. Page 8. A person cannot be overweight and obese. Revise to indicate OR.

4. Page 9. The formatting of the subheadings within the result section is not consistent.

5. Page 9 and 10. The data regarding the MRS scores and IPAQ energy expenditure should be reflected in a table. Importantly, a descriptive table expressing data from all participants would benefit the reader.

6. Page 10. It is misleading to indicate that 94% of individuals who experience depressive symptoms had a BMI > 25 when 91% of the sample had a BMI > 25.

7. Page 23. “History of drug use” label on the table should be corrected to reflect estrogen use.

**Level of interest:** An article of importance in its field
Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declare that I have no competing interests