Commentary on: Stretching is Superior to Brisk Walking for Reducing Blood Pressure in People With High-Normal Blood Pressure or Stage I Hypertension

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Ko et al¹ recently concluded that stretching is superior to walking for improving several blood pressure outcomes in adults with raised blood pressure. These results have potentially significant implications for the management of hypertension, which is important because raised blood pressure affects over 1 billion people globally,² and aerobic exercise (eg, walking) is recommended as a key management strategy.^{3–5} We commend Ko et al¹ for prospectively registering their trial (NCT02391779). However, we have some queries about the notable differences between the trial registration and the current manuscript. We believe these questions are important as transparent reporting of trials helps increase the reliability and trustworthiness, not only of the findings⁶ of the current study by Ko et al,¹ but of science more broadly.

First, the trial registration reports a 4-arm factorial trial intending to examine flaxseed lignan supplement in combination with an exercise program in the following groups: supplement + walking, placebo + walking, supplement + stretching, and placebo + stretching. All groups will also receive the Dietary Approaches to Stop Hypertension diet and the estimated enrollment is 100 participants. The trial registration indicates this trial was completed in July 2017. However, the manuscript by Ko et al¹ only reports a 2-group trial comparing stretching and walking, with no mention of the supplement intervention and a total of only 40 participants. Could the authors please explain and reconcile these differences?

Second, the primary outcome in the trial registration is “Change in 24-hour ambulatory systolic blood pressure,” but this outcome does not appear to be reported in the manuscript. Rather, the day- and night-time aspects have been reported separately, which are not present in the trial registration. Of the dissected 24-hour ambulatory measures, the night-time diastolic blood pressure and mean arterial pressure were found to be significantly different between groups. Could the authors please clarify the results for the prespecified primary outcome, or explain why it is not reported and why this result has been divided into day- and night-time segments?

Similarly, several secondary outcomes from the trial registration are not reported in the manuscript (eg, standing blood pressure, adverse events), and there are some outcomes reported in the manuscript that were not prespecified in the trial registration (eg, sitting blood pressure). We find it pertinent to query this latter addition and why it was not reported transparently, if it was indeed a post hoc decision, because it features as a key result in the authors’ manuscript yet it was never prespecified as an outcome of

interest. Furthermore, the title and conclusions of the manuscript appear to be based on a significant difference between groups for a small proportion of the secondary outcomes (1 of 18 preregistered secondary analyses—supine diastolic blood pressure, and 5 other outcomes—night-time diastolic and mean arterial blood pressures, sitting systolic and mean arterial blood pressures, and supine diastolic and mean arterial blood pressures). These statistically significant results could possibly be due to chance given the number of analyses conducted.⁷

We raise these queries because selective reporting is an important issue in the publication of clinical trials,⁸ which may increase the risk of spurious findings.⁹ We hope the authors are able to clarify our queries on the differences between the trial registration and the published article.

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