Reviewer's report

Title: A Randomized Trial of an Intervention to Improve Use and Adherence to Effective Heart Disease Prevention Strategies

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Reviewer: Nawanan Theera-Ampornpunt

Reviewer's report:

Overall comments
This article reports on a randomized controlled trial evaluating the effects of patient-targeted prevention intervention for coronary heart disease (CHD) on predicted CHD risks, self-reported adherence, and CHD risk factors in a single study site. The intervention consists of an initial-visit computerized decision support tool and repeated computer-generated tailored messages mailed to patients. The findings provide some preliminary support for the benefits and feasibility of the intervention. It could open the door for future research to evaluate simple, automated strategies that are potentially efficacious in improving patient adherence.

The overall study design, measurement, and data analysis seem appropriate and adequate. Important limitations have been acknowledged. A key concern I have on the methodology is the small and underpowered sample size that seems at least partly responsible for a number of non-significant findings. This unfortunate pitfall limits the scientific value of the results despite other well-designed aspects.

Major Compulsory Revisions
1. Given the small sample size and the fact that low power seems to plague much of the discussion, it would be helpful to readers if an estimate of the study's power can be provided (e.g. under "Sample Size" on page 11) so readers can better judge for themselves how sample size impacted the significance.

2. The background section should be expanded as follows to provide clearer introductory background for readers:
2.1 A brief review of key primary prevention strategies for CHD
2.2 It should argue why patient-targeted interventions for CHD primary prevention is important. This is especially important because many decision support tools in primary care target clinicians, so providing a solid justification for targeting patients would better convey the study's significance.

3. It was not clear when reading the manuscript on page 6 (under Patient Recruitment and Enrollment) what was in the baseline survey and on page 8 (under Delivery of the Intervention and Surveys) what the survey following the clinic visit inquired.
4. A one or two brief sentence reviewing how the Framingham risk equation is calculated should be added (e.g. on page 6 under Patient Population) so unfamiliar readers would not need to refer to the cited article just to get an idea how CHD risk was derived, especially given that it is one of the primary outcomes of this study.

5. While lack of significance possibly due to small sample size has been noted in the manuscript, in some of the discussions the lack of significance was not noted when discussing the trend in positive effects. For example, on pages 13-14 (under Effect of the Intervention on CHD Risk Factors) when reporting the non-significant reduction in blood pressures.

6. Apart from the descriptive statistics, Table 1 should indicate which characteristic is statistically different between the intervention and control groups.

Minor Essential Revisions

7. On Table 1, note the first line of the footer that was on the right of the table. Also, the legend ** (appeared on the last row of table) was not defined.

8. The manuscript uses the term "ASA" on Table 3 and Figure 2 but used "Aspirin" in the text. It would help to be consistent.

9. On Table 4, I would encourage the authors to use a different symbol in place of the +/- sign on the table title given the sign's inherent meaning, to minimize confusion.

10. Comparing the number of subjects between the text and Figure 1, the intervention arm seems to have lost 2 subjects (e.g. check to see if any visit no show was missing from the "81 intervention" box). Also please provide a brief explanation for false inclusions either in the figure or in the text (e.g. were they ineligible but was misclassified as eligible, or some other reasons?)

11. On supplementary Appendix 2, under the row "Cost", note that the last bullet in the right-hand column has a misplaced opening parenthesis.

12. On page 8, under Tailored Adherence Messages, note that the paragraph has two font sizes.

Discretionary Revisions

13. On Table 3, it might be helpful to include the adjusted effect size (e.g. odds ratio?) in addition to the p-values, since the absolute difference in the second column from right uses a different set of controlling variables. This is especially important considering that this study has a small sample size so the provided p-values have limited value.

14. It would be helpful to discuss how the interventions can be implemented in other ways. For example, would it be feasible to provide the decision aid and tailored messages in a personal health record (PHR) system or an online consumer health web site? Would you expect the benefits to be similar or
different? This discussion would not only encourage further innovative implementations of such interventions, but also allow evaluation studies of the interventions to be conducted in other ways, hence assessing its external validity. It would also be relevant in this era of "Meaningful Use" and increased attention on consumer health informatics.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.