Author's response to reviews

Title: Association of Health Literacy with Complementary and Alternative medicine use: A Cross-sectional study in Adult Primary Care Patients

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Author's response to reviews: see over
Dear Miss Peubla,

We would again like to thank the reviewers for their important and insightful comments and we believe we have addressed all of the criticisms posed. We firmly believe that these comments have strengthened the quality of the paper and concur with all your recommended changes as indicated in below:

Referee 2:

(1) No further revisions needed.

Referee 4:

Page 12, second paragraph:
‘Our results also indicate that health literacy status differed by CAM use category. Specifically, adequate health literacy was associated with vitamin use while inadequate health literacy was associated with meditation use.... Also, unmeasured patient level factors such as health knowledge may have influenced our results. It is possible that patients with increased health knowledge may be more apt to take pill based therapies compared to other CAM modalities based upon prior familiarity with medications.’

Comment:

The authors introduced the concept ‘health knowledge’ here. What is the difference/relationship between ‘health knowledge’ and ‘health literacy’? Also the jump to the association between health knowledge and pill based therapies is too fast. I think the authors need to explain further on this... and provide a reference if appropriate?

We agree and have edited the sentence as follows:

Also, unmeasured patient level factors such as comorbid illnesses may have influenced our results. For instance, it is possible that patients with comorbid illnesses and subsequent disease familiarity may be more apt to take pill based therapies compared to other CAM modalities based upon prior familiarity with medications.

Referee 5:

Major compulsory:

(1). The authors are upholding the sequence of their analysis. This is unacceptable. They have documented that race is an effect modifier in the study of the association of health literacy with complementary and alternative medicine use. It then gives no meaning in presenting results of the general association with the race categories combined. To illustrate by an example: If a risk factor is associated with a 90% lower risk in one race and a 10-fold increase in another
race, it gives no meaning to state that there is no association between the risk factor and disease.

We agree and have edited our paper based upon the referee’s feedback. We only report our analysis stratified by race and changed text in the abstract methods, results and conclusions. We have also edited these sections in the main text including the statistical analysis section.

Abstract sections are edited as follows:

Methods:

We found a race by health literacy interaction and ran sequential logistic regression models stratified by race to test the association between health literacy and overall CAM use (Model 1), Model 1 + education (Model 2), and Model 2 + other demographic characteristics (Model 3). We reported the effect of health literacy on CAM use for both whites and African Americans independently.

Results: 75% of the participants had adequate literacy and 80% used CAM. CAM use differed by CAM category. Among whites, adequate health literacy was significantly associated with increased CAM use in both unadjusted (Model 1, OR 7.68; p=0.001) and models adjusted for education (Model 2, OR 7.70; p=0.002) and other sociodemographics (Model 3, OR 9.42; p=0.01). Among African Americans, adequate health literacy did not predict CAM use in any of our models.

In the abstract we have edited the conclusion to reflect these changes as follows:

Conclusion:

We found a race by literacy interaction suggesting that the relationship between health literacy and CAM use differed significantly by race. Adequate health literacy among whites is associated with increased CAM use as compared to African Americans.

Edited main text sections:

Statistical Analysis

Third, we tested and found a race by literacy interaction in our analysis. We subsequently ran sequential logistic regression models stratified by race to test the association between health literacy and overall CAM use (Model 1), health literacy and overall CAM use controlling for education (Model 2), and health literacy and overall CAM use controlling for both education and other demographic characteristics (Model 3). We only reported significant findings for both whites and African Americans independently.
In the results section, we only report our findings stratified by race and removed previous statements based upon the referee’s feedback as follows:

Table 3 shows sequentially built logistic models of CAM use. Our analysis did show a significant race literacy interaction and subsequent testing of our separate models by racial category (Table 3) revealed that adequate health literacy among whites was associated with increased CAM use (Model 1, OR 7.68; 95% CI 2.35-25.1, p=0.001). Adequate health literacy among whites remained significantly associated with increased CAM use after controlling for education (Model 2, OR 7.70; 95% CI 2.14-27.7, p=0.002) and other demographics (Model 3, OR 9.42; 95% CI 1.66-53.5; p=0.01). Adequate health literacy among African Americans was not significantly associated with CAM use (Model 1, OR 1.15; 95% CI 0.50-2.64; p=0.74 and remained not significantly associated with CAM use after controlling for education (Model 2, OR 0.86; 95% CI 0.33-2.23; p=0.76) and socio-demographics (Model 3, OR 0.97 95% CI 0.27-3.48; p=0.96).

We also have edited the main text conclusion to reflect the above edits as follows:

Although previous studies have demonstrated that CAM use is associated with educational attainment [6,13-16], to our knowledge this is the first study to examine the association between health literacy and CAM use. In summary, we found a race by literacy interaction suggesting that the relationship between health literacy and CAM use differed significantly by race. We found that adequate health literacy among whites is associated with increased CAM use as compared to African Americans. This implies that racial differences exist regarding the influence of health literacy on CAM use. Further research is needed to examine the possible mechanisms by which health literacy and CAM use are related. These studies should include analysis of reasons for CAM use in order to provide insight into what environmental factors contribute to CAM use. These efforts may help identify which internal and external factors in a diverse population increase the likelihood of CAM use.

Also Table 3 has been edited to only capture analysis stratified by race.

(2). The authors have given the number of individuals recruited and the number completing the surveys. Please give also the number invited.

The number invited equaled the number recruited in the study and we have edited the first sentence in ‘Overall Sample Characteristics’ to reflect this as follows:

A total of 351 men and women were invited and recruited. 347 (98.8%) participants completed the surveys.

(3). Table 2 uses rounding inconsistently. In addition the first row showing overall CAM use uses percentages completely differently than all other rows (It shows percentages among those with adequate and inadequate literacy in relation to all persons reporting CAM use). The first row should show percentages in the same
way as the other rows (Percentage using a therapy divided by all subjects within the respective adequate or inadequate health literacy category). The text needs to be changed accordingly. The sentence "There was no statistically significant difference in the proportion of adequately and inadequately health literate patients." gives no meaning. The p-value relates to the proportion using CAM in persons with adequate or inadequate literacy!!

We agree and have edited Table 2 to reflect CAM use percentages consistently for all rows. We have also edited Table 2 and the other tables to reflect consistent rounding and changed the text accordingly under ‘Health Literacy and different types of CAM use’ to reflect these changes. The text is rounded to the nearest whole number for ease of read as requested by a previous referee.

We have also changed our previous statement, "There was no statistically significant difference in the proportion of adequately and inadequately health literate patients."

The above changes are reflected in the edited paragraph below:

In our overall sample, 80% of the participants used CAM. Categorized by health literacy levels, 82% of those with adequate health literacy used CAM, while 74% of those with inadequate health literacy used CAM and this difference did not attain statistical significance. By CAM use category: 17% used meditation (14% adequate vs. 24% inadequate; p=0.03) and 56% used vitamins (61% adequate vs. 42% inadequate; p=0.003) which were both statistically significant. 52% used prayer (49% adequate vs. 59% inadequate), 18% used relaxation (18% adequate vs. 19% inadequate), 14% used herbal medications (13% adequate vs. 17% inadequate), 6% of the sample used yoga (7% adequate vs. 4% inadequate), 6% used visualization (7% adequate vs. 2% inadequate), 4% used homeopathy (4% adequate vs. 6% inadequate) <1% used tai chi (0.4% adequate vs. 2% inadequate), <1% attended traditional healing (0.4% adequate vs. 2% inadequate), and which were not statistically significant. No subjects used qigong as a CAM modality and subsequently this modality was excluded from our analysis.

(4). The following two sentences given in the first paragraph of the discussion are challenging: "We also found that a majority of our patients utilized CAM compared to those that did not. In our sample patients that used CAM were more likely to have adequate health literacy." They found that a majority of the patients used CAM, but who were they comparing with?? In addition I see no results presented showing that patients using CAM had higher health literacy. I do see results in table 2 showing that CAM use was quite similar in the two levels of health literacy (The result was not statistically significant). As noted above they have a very different indication of percentages in the first row of table 2.

We agree and have removed these two sentences from the discussion and edited the first paragraph of the discussion as follows:
In our study we found that CAM use was not significantly related to health literacy status. We also found a race by literacy interaction suggesting that the relationship between CAM use and health literacy differed significantly by race. Consistent with our hypothesis, our analysis by race revealed that CAM use was related to adequate health literacy among whites however, CAM use was not related to health literacy among African Americans. Among whites, the relationship between CAM use and adequate literacy remained significant after adjusting for educational attainment and other sociodemographic variables. Also, health literacy levels were higher among whites as compared to African Americans suggesting that adequate health literacy may predict overall CAM use. This is consistent with research that health literacy skills are associated with health seeking behaviors [41,42].