Author’s response to reviews

Title: Health literacy among older adults is associated with their 10-years' cognitive functioning and decline - the Doetinchem Cohort Study

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Author’s response to reviews:

Dear dr. Chen,

Thank you for providing us with the opportunity to revise and resubmit our manuscript entitled “Health literacy among older adults is associated with their 10-years’ cognitive functioning and decline - the Doetinchem Cohort Study” to BMC Geriatrics.

In this letter, we address the comments of the reviewers by literally repeating each comment, and then describing our responses, preceded by [RESPONSE], and followed by the text that has been modified in response to each of the comments (within quotation marks). We also provide a new version of our manuscript in which ‘tracked changes’ were used to indicate which changes were made. As requested, a list of abbreviations was added to our manuscript.
We thank the reviewers for their comments. We hope that the revised version of our manuscript can contribute to the contents of the BMC Geriatrics.

With kind regards,
Also on behalf of the other authors

Bas Geboers, PhD

Editor

Please include a list of abbreviations.

[RESPONSE]

A list of abbreviations was added (lines 352-354). Our apologies for the omission in the previous version of our manuscript.

Mei-Ju Chi, Ph.D. - Reviewer 1

1.

According to the health literacy definition from WHO, "Health literacy represents the cognitive and social skills that determines the motivation and ability of people to access, understand, and use information in ways that promote and maintain good health”, the relation between cognitive functioning and health literacy has already been proofed. The research is not innovative enough.

[RESPONSE]

Thank you for this comment. We acknowledge that some degree of conceptual overlap may exist between health literacy and cognitive functioning. However, most researchers in the field of health literacy consider cognitive functioning and health literacy to be separate constructs. This view is also supported by empirical research. We added some text to the discussion section to
clarify this (lines 296-298): “A degree of conceptual overlap may also exist between cognitive functioning and health literacy. However, empirical studies show that cognitive functioning and health literacy are separate constructs that have independent effects on various outcomes [25, 26].”

We also acknowledge that the association between cognitive functioning and health literacy has been shown in previous studies, as we also mentioned in the introduction section (lines 69-73). However, the relation between changes in cognitive functioning (i.e. cognitive decline) and health literacy has received much less attention. Additionally, further evidence is needed to determine the validity and generalizability of the previous findings. As also mentioned in our response to reviewer 2, we have made adjustments to our introduction section to emphasize the most innovative aspects of our study (lines 73-76):

“However, evidence lacks about how a decline in cognitive functioning affects health literacy at an older age. In order to answer such research questions, longitudinal data is needed.”

And lines 78-86:

“Current evidence on the longitudinal association of cognitive decline with health literacy is very limited. One study has shown that cognitive abilities at age 11 are positively associated with health literacy at age 67 [11], but this does not regard cognitive decline. Only two studies addressed associations of cognitive decline with low health literacy [12] and health literacy decline [7] but these regarded a relatively short follow-up time, i.e. less than six years. Evidence on the associations of cognitive decline and health literacy during longer follow-up periods fully lacks.”

Additionally, our study is the first that suggests that stronger cognitive decline is already associated with low health literacy in relatively young older adults. We realize that this was not stated sufficiently clearly in our manuscript. We have therefore added the following text to the discussion section (lines 284-285):

“To our knowledge, our study is the first to suggest that associations between cognitive decline and low health literacy already exist in relatively young older adults.”
2.

This research used a cohort study database which included multivariate such as lifestyle, biomarkers, health and disease...etc. These variables also have a significant impact on health literacy, but authors only adjusted for age, gender and education. I suggest that adding health and disease variables into the logistic model to increase the persuasiveness of results.

[RESPONSE]

Thank you for this comment. We have considered and extensively discussed controlling our analyses for health status. After careful consideration, we decided not to do this. Our reason for this was that, unlike age, gender, and educational level, health status does not meet all criteria for confounding and may also be a partial mediator. In order to be considered a proper confounder, a variable cannot be a consequence of the predictor variable (i.e. cognitive functioning and cognitive decline). Many studies suggest that various health outcomes are the direct consequence of cognitive functioning and cognitive decline. As a result, adding health status (or disease outcomes) to our analyses will likely obscure the actual relations of cognitive functioning and cognitive decline with health literacy. We have added a remark on health status as a potential confounder or mediator in the discussion section. The added text is (lines 339-340):

“Additionally, such studies could examine the potential confounding or mediating role of health status in these relations.”

Heng-Hsin Tung - Reviewer 2

The major concern of this article is what's the new finding? The associations of cognitive functioning and cognitive decline with health literacy in older adults was confirm in previous research. What can we use this data in the reality and what's the contribution to the health care?

[RESPONSE]

Thank you for this comment. We acknowledge that the association between cognitive functioning and health literacy has been shown in previous studies, as we also mentioned in the introduction section (lines 69-73). Additional studies are, however, useful to determine the validity and generalizability of previous findings.
Evidently, we have not been sufficiently clear about the innovative issues in our paper, as was also noted by Reviewer 1 (comment 1). We have made adjustments to our introduction section to emphasize the most innovative result of our article (lines 73-76):

“However, evidence lacks about how a decline in cognitive functioning affects health literacy at an older age. In order to answer such research questions, longitudinal data is needed.”

And lines 78-86:

“Current evidence on the longitudinal association of cognitive decline with health literacy is very limited. One study has shown that cognitive abilities at age 11 are positively associated with health literacy at age 67 [11], but this does not regard cognitive decline. Only two studies addressed associations of cognitive decline with low health literacy [12] and health literacy decline [7] but these regarded a relatively short follow-up time, i.e. less than six years. Evidence on the associations of cognitive decline and health literacy during longer follow-up periods fully lacks.”

In addition, we also added a sentence to our discussion section (lines 284-285):

“To our knowledge, our study is the first to suggest that associations between cognitive decline and low health literacy already exist in relatively young older adults.”

Additionally, we added a sentence to the section on implications to clarify what our results implies for practice (lines 326-328):

“As cognitive decline is even associated with low health literacy in relatively young older adults, health professionals should be aware that early identification of the most vulnerable group is especially important.”