

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Raising awareness for dementia risk reduction through a public health campaign: a pre-post study
AUTHORS	Heger, Irene; Köhler, Sebastian; van Boxtel, Martin; de Vugt, Marjolein; Hajema, KlaasJan; Verhey, Frans; Deckers, Kay

VERSION 1 – REVIEW

REVIEWER	Perla Werner University of Haifa, Israel
REVIEW RETURNED	22-Jun-2020

GENERAL COMMENTS	<p>This manuscript describes findings of a study assessing the effectiveness of a campaign aimed at increasing public awareness about dementia.</p> <p>General comments: Overall, the manuscript is well written and could contribute to a raising amount of literature on the topic. I believe the manuscript would benefit greatly if it could be simplified somewhat and shortened in the Results section. Instead, more information should be provided about the state of knowledge in the area.</p> <p>Specific comments</p> <ol style="list-style-type: none">1. The size of the sample should be clearly stated.2. Abstract: It should be stated in line 15 "most often" than what?3. Introduction. There is need to include information about other studies examining campaigns aimed at increasing awareness, knowledge, and decreasing stigma of dementia. These might include among others: Hickey et al., 2019; Kim et al., 2019; Liu et al., 2019; Werner et al., 2017; Woo, 2017, and others.4. Introduction. First line – what does "leading to inferences..." mean?5. Methods section – there is need to include additional information regarding the measures used. More specifically, the scales used should be added, some items should be provided for readers not familiar of the scales used.6. Methods section – Page 8, two first lines – it should be clearly stated that this statement is intended to operationalize awareness of dementia. The rationale for presenting this statement in the Results section differently than the way it was presented to the participants is not clear to me. I think at least this should be stated with an asterisk.7. Results section – reasons for refusal should be stated.8. Results section – it is not clear to me what are the "campaign expressions"9. Results section – Page 13. Under Difference in level of awareness before and after the campaign (total sample) – we are
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	<p>told that cognitive activity was identify most often, but under Differences between the two campaign approaches we are being told differently. Am I missing something? I would appreciate if the authors could clarify this point.</p> <p>10. Results – On page 14, we are presented with the percentage of participants reporting having heard about the campaign. First, I would suggest to present this information earlier on. Second, did the authors assess what "having heard" means? Did they see the campaign? Heard about it from others? Moreover, were analyses conducted to compare between those who heard and those who didn't (although obviously the numbers will be very small). And, if indeed only less than 50 of the participants heard about the campaign, are the authors really assessing the effectiveness of the campaign. I'm afraid I might be mistakenly interpreting the results. Would appreciate if the authors could clarify and discuss on these points.</p> <p>11. Results – Page 14, line 12 from the bottom – when talking about becoming more aware do the authors refer to the statement referred to in point 6 above?</p> <p>12. Results – Page 15. This is the first time the reader is presented with the 12-item quick test. More knowledge about the test is provided only in the Supplementary materials. This information should be added to the main text of the manuscript.</p> <p>13. Discussion – Overall, the findings of the study should be discussed within the framework of other studies in the area (as stated above).</p> <p>14. Discussion – Page 16. What do the authors mean by the sentence "Importantly, the campaign was designed with differences in health literacy and socio-economic status in mind...."?</p> <p>15. It is not clear to me what to include reference number 18 when discussing the strengths of the study.</p> <p>16. Page 18 – The authors should be more clear, focused, and specific regarding the strengths of the present study, instead of the strengths of campaigns, exposure, etc.</p> <p>17. Figure 1. Add number of participants (n)</p> <p>18. Figure 2. Add number of participants and information about how insufficient and good knowledge were operationalized.</p> <p>19. Supplementary material 4a – an arrow is missing from participants included in the survey to total sample.</p>
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REVIEWER	Mitchell McMaster Centre for Research on Ageing, Health and Wellbeing, Australian National University, Australia
REVIEW RETURNED	02-Jul-2020

GENERAL COMMENTS	The reviewer provided a marked copy with additional comments. Please contact the publisher for full details.
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1 (Perla Werner):

General comments:

1. *Overall, the manuscript is well written and could contribute to a raising amount of literature on the topic. I believe the manuscript would benefit greatly if it could be simplified somewhat and shortened in the Results section. Instead, more information should be provided about*

the state of knowledge in the area.

REPLY: We thank the reviewer for her extensive and constructive feedback. We have added a heading (“Exposure to the campaign”, page 13, line 215 – 221) and made some textual changes in the Results Section in order to give more structure to this section of the manuscript. We hope that this improves the readability. We do believe that all information we now provide is necessary in order to interpret the results.

We have provided more information about the state of knowledge in the Introduction Section (page 5, lines 108 – 115), and used more literature sources to explain our results in the Discussion Section (page 16, line 300 – 308). The specific changes made in the manuscript are explained in more detail in response to the specific comments below. We used the track changes mode to highlight the changes in the manuscript. Page and line numbers mentioned in this response letter refer to the “Main document – marked copy” version of the manuscript).

Specific comments:

1. *The size of the sample should be clearly stated.*

REPLY: We have added this information in the first sentence of the Results-section of the Abstract (page 2, line 32-33): “No pre- (n=590) post- (n=602) difference was observed in people agreeing to the statement that dementia risk reduction is possible”.

2. *Abstract: It should be stated in line 15 "most often" than what?*

REPLY: To clarify this, we have changed the sentence in the Abstract (page 2, line 35 – 38) into:

“**Of all risk/protective factors assessed**, cognitive activity was identified most often at both pre- (79.4%) and post-assessment (80.4%), but there was no increase in awareness.”

3. *Introduction. There is need to include information about other studies examining campaigns aimed at increasing awareness, knowledge, and decreasing stigma of dementia. These might include among others: Hickey et al., 2019; Kim et al., 2019; Liu et al., 2019; Werner et al., 2017; Woo, 2017, and others.*

REPLY: We thank the reviewer for these literature suggestions. We have added the study of Liu et al., 2019 in our citation concerning low awareness of dementia risk reduction (Introduction Section, page 5, line 100 – 101): “It must, however, be noted that the general public is still largely unaware of the potential of dementia risk reduction, let alone of specific actions to reduce dementia risk”.

Furthermore, we have added a paragraph to the Introduction Section (page 5, line 108 – 115) about other awareness campaigns:

“Dementia awareness campaigns have focused on topics as improving recognition of dementia (Askari et al., 2018), dementia care (Moorhouse et al., 2014), decreasing public stigma (Kim et al., 2019; Werner et al., 2018), and few on dementia risk reduction (Farrow et al., 2013; Hickey et al., 2019). An Australian study using an informative website on dementia risk reduction resulted in increased knowledge and motivation to engage in relevant health behaviours. However, no population-level measurements for evaluation were used and the study only included a post-intervention assessment of people visiting the website (Farrow et al., 2013). One population-based national awareness campaign in Ireland found a significant increase in people agreeing that “there are things you can do to reduce your risk”. However, awareness of dementia risk reduction was not associated with recognition of the advertisements used during the campaign (Hickey et al., 2019).”

Also, we provided more information in the Discussion Section (page 16, line 300 – 308) explaining the results of this awareness campaign:

“Several reasons might exist. This campaign did not use national mass media, in contrast to a population-based awareness campaign in Ireland that did find a significant increase in

awareness of dementia risk reduction (Hickey et al., 2019). Due to a limited budget and resources, the coverage of our campaign might have been insufficient to reach population-level increase in awareness. Interestingly, our study did find an increase in awareness in those who reported to have been exposed to the campaign, while the Irish study could not differentiate between the exposed and non-exposed group (Hickey et al., 2019). Women stated more often than men to be exposed to our campaign material and to have visited the eHealth platform, which is in line with previous studies stating that women participate more than men in health campaigns (Compernelle et al., 2014). However, this did not translate in an increase in awareness in women at post-assessment.”

4. *Introduction. First line – what does "leading to inferences..." mean?*

REPLY: Thank you for your alertness, we have changed “inferences” into “interferences” (page 4, line 68).

5. *Methods section – there is need to include additional information regarding the measures used. More specifically, the scales used should be added, some items should be provided for readers not familiar of the scales used.*

REPLY: We have indeed described the used measurements only briefly. The reason for this is that these are described in more detail in an earlier publication (Heger et al., 2019), including the appended complete survey. We have decided to append the pre- and post-survey to the Supplemental Files and added the following sentence to the Measurements-paragraph of the Method Section (page 8, line 179 – 180):
“See Supplemental File 3 for the complete pre- and post-campaign survey.”

6. *Methods section – Page 8, two first lines – it should be clearly stated that this statement is intended to operationalize awareness of dementia. The rationale for presenting this statement in the Results section differently than the way it was presented to the participants is not clear to me. I think at least this should be stated with an asterisk.*

REPLY: We presented this statement in a positive form for reasons of clarity, since the original statement, taken from the British Social Attitude Survey (BSA; Marcinkiewicz & Reid, 2016), included a double negation (i.e. “disagreeing that there is nothing you can do to reduce the risk”). We believe that stating this in a positive, more simple manner improves the readability of this manuscript, and in retrospect, would also have been more suitable for participants in the survey (as discussed in the Discussion Section, page 16, line 308 – 312).

We agree with the reviewer that this change in presentation of the statement is not explained clearly yet throughout the manuscript. Therefore, we have made the following changes:

- Method Section, Measurements (page 8, line 180 - 184):

“**The primary outcome of awareness of dementia risk reduction was assessed as** the difference between pre- and post-assessment in the proportion of people rejecting the statement ‘There is nothing I can do to reduce my dementia risk’. We presented this statement in the Results section in a positive form **for reasons of clarity** (“dementia risk reduction is possible”).”

- We have added a footnote in both figures (page 21, line 406 – 419):

“¹Original statement presented to participants: “There is nothing I can do to reduce my dementia risk”.

7. *Results section – reasons for refusal should be stated.*

REPLY: We agree that it would have been very informative to know reasons for non-response (rather than refusal), and to study differences in demographics in those who participated and those who did not. Unfortunately, we do not have these data, which are notoriously difficult to collect. Eligible participants from an existing sampling frame were (repeatedly) invited by email. We do not know why people did not respond to this invitation, and no systematic action was taken to inquire further into reasons of non-response.

8. *Results section – it is not clear to me what are the "campaign expressions"*

REPLY: We understand from both reviewers that this is described somewhat ambiguously. We attempted to describe all forms of community engagement during the campaign, from websites visits, to organization of campaign events (e.g. workshops), to displaying posters in a shop. We have changed the term (upon the advice of the second reviewer) "campaign expressions" to "forms of community engagement" (see page 9, line 207, and page 12, line 212).

9. *Results section – Page 13. Under Difference in level of awareness before and after the campaign (total sample) – we are told that cognitive activity was identify most often, but under Differences between the two campaign approaches we are being told differently. Am I missing something? I would appreciate if the authors could clarify this point.*

REPLY: We investigated 1) the percentage of people correctly identifying dementia risk and protective factors, both at pre-assessment and post-assessment, and 2) the increase that was observed in identification of these risk and protective factors from pre- to post-assessment (effect of the campaign). We observed that, both at pre- and post-assessment, cognitive activity was most often identified as a protective factor compared to the other 11 factors, such as diet, smoking, obesity. However, there was no increase in identification observed (from pre- to post) for cognitive activity. To give an example: pre-campaign identification of cognitive activity was 79.4% and of physical activity was 63.3%. At post-campaign, the identification of cognitive activity was still highest of all factors (80.4%), but no significant increase in identification was observed (1.0% increase), like we did observe for physical activity (increased to 70.9%; 7.6% increase). In the Discussion Section (page 16, line 301 – 303), we discuss the possibility of a ceiling effect for the protective factor cognitive activity.

We hope that this clarifies the results regarding the protective factor cognitive activity. In the Results Section, paragraph "Differences between the two campaign approaches" (page 14, line 242 – 245) we have added: "**Compared to pre-assessment**, cognitive activity was not identified more often as a protective factor for dementia **at post-assessment**, either in the population or district sample".

10. *Results – On page 14, we are presented with the percentage of participants reporting having heard about the campaign. First, I would suggest to present this information earlier on.*

REPLY: We agree with the reviewer that this information could be presented earlier in the Results Section. Therefore, we have added an additional paragraph earlier on in the Results Section "Exposure to the campaign" (page 13, line 215 – 221), in which we describe the percentages of exposed (having heard of the campaign, slogan, eHealth platform, recognizing campaign material) and non-exposed people, and analyze differences with regard to sex, educational level and age:

"Exposure to the campaign

"Of all post-campaign participants (n=602), 20.0% reported to have heard of the campaign, 19.7% of the slogan, and 21.8% about the eHealth platform, and 29.8% recognized one of the campaign materials (e.g. poster, flyer). Women heard more often about the eHealth platform (27.5% vs. 16.3%; $X^2(1) = 9.75, p = .002$) and recognized campaign material more often (34% vs. 25.8%; $X^2(1) = 4.23, p = .040$) compared to men. Lower educated participants recognized campaign material more often than more highly educated participants did (33.5% vs. 25.1%; $X^2(1) = 4.28, p = .039$)."

However, we prefer to present the sub-analyses in which we compare those who had heard and those who had not heard of the campaign ("Exposure to the campaign and level of awareness in the total post-campaign sample (n=602)") after the paragraphs presenting the main analyses on differences in awareness. We deliberately assessed awareness prior to exposure to the campaign in our survey (in order to ensure that the potential increase in awareness was not caused by learning effects).

Second, did the authors assess what "having heard" means? Did they see the campaign? Heard about it from others?

REPLY: "Having heard of the campaign" was assessed with one question that literally asked participants if they had heard of a campaign than ran during the last year on the topic of dementia prevention (answer options: yes/no; see Supplemental File 3, "Extra items post-assessment", question 1). Since this campaign was developed in consultation with the local municipal health services, we are ascertained that no related campaigns/interventions were present during that time in the three specific districts within the Province. However, we did not investigate in detail if participants were actually exposed to the campaign. We did investigate the recognition of campaign manifestations (e.g. campaign posters, flyers, eHealth platform). We hope that the different evaluative items presented in the Results Section will be more clear after the adjustment made within this section. For this purpose, we also added the complete survey to the Supplemental Files.

Moreover, were analyses conducted to compare between those who heard and those who didn't (although obviously the numbers will be very small). And, if indeed only less than 50 of the participants heard about the campaign, are the authors really assessing the effectiveness of the campaign. I'm afraid I might be mistakenly interpreting the results. Would appreciate if the authors could clarify and discuss on these points.

REPLY: We indeed think that the reviewer misinterpreted the results here. From the 535 participants of the post-campaign survey (lower number than total post-campaign sample due to dropout during the survey), 107 participants had heard about the campaign. These were compared to the 428 participants that had not heard about the campaign regarding awareness of dementia risk reduction. This showed that those who had heard of the campaign significantly more often showed awareness of dementia risk reduction compared to those who had not heard of the campaign (51.4% and 37.9%, respectively). We are not sure who the 50 participants are that the reviewer is referring to. Maybe these are the 55 participants that make up the 51.4% who had heard of the campaign and were aware of dementia risk reduction.

We hope to clarify this matter by adding the following to the Results Section, paragraph "Exposure to the campaign and level of awareness in the total post-campaign sample (n=602)" (page 14, line 262 - 264):

"Awareness of dementia risk reduction was higher for post-campaign participants who reported to have heard **compared to those who have not heard** of the campaign (51.4% vs. 37.9%)..."

11. *Results – Page 14, line 12 from the bottom – when talking about becoming more aware do the authors refer to the statement referred to in point 6 above?*

REPLY: No, we do not, and we realize now that using the word "aware" is confusing in this regard. Here, we refer to people that reported to have become more conscious of their brain health, and the relationship with lifestyle, over the last (campaign) year (see Supplemental File 3, "Extra items post-assessment", question 8). We have changed "aware" into "conscious of" (Results Section, page 15, line 268). Throughout the manuscript, "aware(ness)" now refers to the statement of awareness of dementia risk reduction as described in point 6 above.

12. *Results – Page 15. This is the first time the reader is presented with the 12-item quick test. More knowledge about the test is provided only in the Supplementary materials. This information should be added to the main text of the manuscript.*

REPLY: The quick test is based on the LIBRA index, which we do mention in the Method Section. However, we fully agree with the reviewer that this should be more clearly explained. Therefore, we adjusted the second sentence of this paragraph ("The eHealth platform", page 7, line 157). into: "**Users complete a "12-item quick test** using the well-

validated Lifestyle for BRAin Health (LIBRA) score...”

13. *Discussion – Overall, the findings of the study should be discussed within the framework of other studies in the area (as stated above).*

REPLY: We agree with the reviewer and incorporated more literature in both the Introduction and Discussion Sections. As already mentioned in response to comment 3, we have added the following to the Discussion Section (page 16, line 300 – 308):

“Several reasons might exist. This campaign did not use national mass media, in contrast to a population-based awareness campaign in Ireland that did find a significant increase in awareness of dementia risk reduction (Hickey et al., 2019). Due to a limited budget, the coverage of our campaign might have been insufficient to reach population-level increase in awareness. Interestingly, our study did find an increase in awareness in those who reported to have been exposed to the campaign, yet this number of people was very small, while the Irish study could not differentiate between the exposed and non-exposed group (Hickey et al., 2019). Women stated more often than men to be exposed to our campaign material and to have visited the eHealth platform, which is in line with previous studies stating that women participate more than men in health campaigns (Compennolle et al., 2014). However, this did not translate in an increase in awareness in women at post-assessment.”

14. *Discussion – Page 16. What do the authors mean by the sentence "Importantly, the campaign was designed with differences in health literacy and socio-economic status in mind...."?*

REPLY: This health campaign targeted a heterogeneous group of people: inhabitants of a whole province, with approximately 558,535 people in our age range (40-75 years). Therefore, we deliberately designed our campaign in a way that would address different people. For example, we checked all our content with experts from the municipal health services regarding suitability for people with low (health) literacy, and a professional campaign agency. We provided both a low-level and free app with short, simple text messages that appeared automatically on a daily basis, and provided an extensive website for background information and references to extra literature (e.g. website Dutch Alzheimer's Association). For the district-campaign specifically, we deliberately chose three districts with varying socio-economic status from low to middle-high, based on information from the municipal health services. We worked together with key-figures and facilities in that district, in order to meet the specific needs and wishes of that district.

We have altered the paragraph “Awareness campaign” in the Method Section (page 7) based on the response above:

Line 140 – 144: “We deliberately designed the campaign in a way that would address different people. We provided both a low-level and free app with short, simple text messages that appeared automatically on a daily basis, and provided an extensive website for background information and references to extra literature (e.g. website Dutch Alzheimer's Association).”

Line 147 – 150: “...based on varying socio-economic status, from low to middle-high, and absence of other public health projects (hereafter “district sample”). We worked together with key-figures and facilities in that district, in order to meet the specific needs and wishes of that district.”

15. *It is not clear to me what to include reference number 18 when discussing the strengths of the study.*

REPLY: We refer to this paper because we used, to a great extent, the same methodology, namely the same questionnaire to assess awareness of dementia risk reduction and of the specific risk and protective factors. This provided us with the opportunity to compare our findings with the findings from the BSA paper (as we did in our baseline paper (Heger et al., 2019), explaining the rationale of the campaign). We have changed the sentence in the

Discussion Section (page 17, 326 – 327) into:

“and comparable methodology **to a previous study assessing awareness of dementia risk reduction.**”

16. *Page 18 – The authors should be more clear, focused, and specific regarding the strengths of the present study, instead of the strengths of campaigns, exposure, etc.*

REPLY: We have added more information on the strengths of the study itself, and introduced the second part of the paragraph (on strengths of the campaign) more clearly and discuss these strengths more concise (Discussion Section, page 17, line 324 – 330):

“Strengths of this study include the extensive pre- and post-campaign surveys, **in which we used multiple items to assess awareness of dementia risk reduction in general, and specific risk and protective factors.** Furthermore, we used large independent samples and comparable methodology **to a previous study assessing awareness of dementia risk reduction. Next, the intervention part (awareness campaign) of this study** was designed in the consultation of experts, addressed, in line with the WHO guidelines, multiple dementia risk factors and collaborated with stakeholders in a multidisciplinary approach.”

17. *Figure 1. Add number of participants (n) 18. Figure 2. Add number of participants and information about how insufficient and good knowledge were operationalized.*

REPLY: We have added the number of participants in the titles of Figure 1 and Figure 2 (and added in the footnotes: “Maximum values and percentages do not count up due to missing values”). We have also added an extra footnote in Figure 2 explaining the operationalization of knowledge of dementia: “Self-reported knowledge of dementia, divided into “Insufficient knowledge” (answering options “I don’t know”, “Nothing at all” and “Not very much”) and “Good knowledge” (“Some”, “Quite a lot” and “A great deal”). See page 21, line 407 – 419.

Supplementary material 4a – an arrow is missing from participants included in the survey to total sample.

REPLY: Thank you for your alertness, we have added the arrow.

Reviewer 2 (Mitchell McMaster)

Main comments (PDF):

My main comments are to do with typos and general expression, I have tracked these changes on the PDF document. Please see the attached.

REPLY: We thank the reviewer for his detailed feedback on our manuscript. We have corrected all and used the track changes mode to highlight the changes made in the manuscript (page and line numbers mentioned in this response letter refer to the “Main document – marked copy” version of the manuscript). The specific changes made in the manuscript are explained in more detail in response to the general comments below.

General comments:

- 1) *You describe the sample as a middle-aged cohort, but the age range is 19-94yrs and greater than 50% of your sample is over 60 yrs. I think “general population” is a more accurate description. Please change throughout.*

REPLY: The described age range of 18-94y in the manuscript (Results Section, paragraph “The eHealth platform”) does not refer to our two cross-sectional samples (pre-campaign and post-campaign), but refers to all people in the general public that used the eHealth platform during the campaign. The eHealth platform was one of the campaign expressions, and therefore available via the app-stores to all Dutch inhabitants, irrespective of their age. Data

on the eHealth platform was assessed via user tracking and was completely anonymous.

The age ranges of the two cross-sectional samples were in fact 40 to 75 years, with indeed mean ages around 60 (except for the district post-campaign sample). To us, it is very important to highlight the fact that we deliberately targeted people in midlife, since all our observational research regarding LIBRA is focused on this age range, and a growing body of evidence shows that this is the best time frame to target most dementia risk and protective factors. We do discuss the hard-to-reach younger part of our target group (in the reach of the campaign, but perhaps also in the reach of a study regarding dementia) in the Discussion section (page 18-19, line 357 – 361).

We hope that the age ranges are more clearly presented by changing the following: in the Method Section (page 7, line 155 – 157) and Results Section (paragraph “The eHealth Platform”, page 15, line 276 - 277):

Method Section, paragraph “The eHealth platform” (line 155 – 156): “An online platform called MijnBreincoach (“MyBraincoach”) was developed together with two software companies and made available as a mobile app and web portal **to the general public during the campaign**”.

Result Section, paragraph “The eHealth platform” (line 281 – 182: **“Anonymous user-tracking showed that the 12-item “quick test” was completed more than 13,300 times by people from the general public during the campaign.”**

- 2) *Could you please report exact significant p values throughout the manuscript to 3 dp, rather than $p \leq .05$, $\leq .01$ etc*

REPLY: We have changed this throughout the manuscript and supplemental files, see track changes.

- 3) *Table 1 only includes participants 40-75 yrs. Please include participants younger than 40 and older than 75. Please also include in the Supplementary Material table.*

REPLY: As stated above in response to comment 1, our cross-sectional samples are aged 40-75 years old because these were the people that we targeted in the campaign. The age range of the people using the eHealth platform is displayed in order to describe the public interest in the eHealth platform during the campaign, irrespective of age.

- 4) *Also, just double checking the significance of the mean age between pre and post in the district sample. A difference of 3.3 years with an SD of 8 was significant? As above can you please report exact p value.*

REPLY: We double-checked our analyses and all mean ages, SD's and the p-value are correct. We have reported the exact p-value ($p=.002$), see Table 1, track changes.

- 5) *In the “What this study adds” section your mention tailoring campaigns to meet the needs of subgroups however your discussion does not mention this, at least not in any detail. Please include more information on tailoring in the discussion.*

REPLY: We fully agree with the reviewer that providing more detailed information on tailoring in the Discussion Section would be of added value. Upon advice of the reviewer, we have added a subheading “Recommendations for future campaigns” (page 18, line 343), in which we describe in more detail our recommendations for tailoring. We added the following (page 18, line 349 – 357): “Furthermore, it is important to tailor health messages to specific subgroups (e.g. based on educational level, age, sex, high/low risk group). Their needs, wishes and barriers to engage in a brain-healthy lifestyle should be further explored, both prior to the execution of a campaign and as a post-campaign evaluation, for example by qualitative research. To illustrate, comparable to earlier studies, our study showed that dementia risk reduction literacy was higher in more highly educated participants. However, awareness only improved in the lower educated group (particularly in the population sample).

The campaign was designed with differences in health literacy and socio-economic status in mind (e.g. content checking by the MHS).”

- 6) *In the same section you also mention age and sex as important factors to consider in risk reduction literacy and while you collected these data you did not analyse their impact on outcomes as you did with education. Please conduct these analyses.*

REPLY: We agree with the reviewer that adding these analyses would benefit the manuscript. Therefore, we have conducted these analyses and added the following to the Results Section (page 13, line 233 – 238):

“In men, level of awareness decreased slightly with 8% ($X^2 (1) = 3.89, p=.049$), but they identified the campaign theme “eat healthy” more often over time ($X^2 (1) = 10.99, p=.001$). The level of awareness remained stable over time in women ($X^2 (1) = 0.09, p=.770$), participants under the age of 65 years ($X^2 (1) = 0.78, p=.377$) and participants aged 65 and above ($X^2 (1) = 1.46, p=.227$), but over time, the theme “exercise regularly” was identified more often by participants under the age of 65 years (9.4% increase; $X^2 (1) = 7.13, p=.008$).”

In the discussion, a suggestion for future research could be public health messages with multiple approaches tailored to different demographics (age, gender, higher/lower SES, higher/lower levels of risk factors etc) this could be followed up with qualitative research to identify barriers/motivations for different groups. Or qualitative research to inform these strategies before a campaign. Just a though...

REPLY: We thank the reviewer for this suggestion. We have incorporated this into our paragraph “Recommendations for future research” (page 18, line 349 – 352) by stating (see also the response to comment 5): “Furthermore, it is important to tailor health messages to specific subgroups (e.g. based on educational level, age, sex, high/low risk group). Their needs, wishes and barriers to engage in a brain-healthy lifestyle should be further explored, both prior to the execution of a campaign and as a post-campaign evaluation, for example by qualitative research.”

VERSION 2 – REVIEW

REVIEWER	Perla Werner University of Haifa, Israel
REVIEW RETURNED	31-Aug-2020

GENERAL COMMENTS	The authors have attended to all the comments.
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REVIEWER	Mitchell McMaster Centre for Research on Ageing, Health and Wellbeing, Australian National University, Australia
REVIEW RETURNED	18-Sep-2020

GENERAL COMMENTS	I commend the authors on their paper. I think this updated paper reads much more clearly. I have no further editing suggestions. I look forward to reading future research outputs from this group. Effective primary risk reduction knowledge and strategies are very important at present.
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