PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Association between healthy lifestyle score changes and quality of life and health related quality of life: a longitudinal analysis of South Korean panel data
AUTHORS	Nari, Fatima; Jeong, Wonjeong; Jang, Bich Na; Lee, Hyeon Ji; Park, Eun-Cheol

VERSION 1 – REVIEW

REVIEWER	Feng, Zeyun Erasmus University Rotterdam, Socio-Medical Sciences
REVIEW RETURNED	21-Feb-2021

GENERAL COMMENTS	This study addressed an interesting topic that how longitudinal healthy lifestyle changes influence the quality of life and health-related quality of life. However, I do have several concerns regarding the methodology of the generalized estimating equation. Methods 1. I have several concerns regarding the choice of generalized estimating equation (GEE) model. GEE is can only provide valid results for a short period. However, the current study involved ten years of observation (from 2006 to 2016), which is considered a long period. Therefore, I am concerned about the use of GEE for this longitudinal dataset. 2. Also, it is unclear which working correlation matrix was chosen for GEE? The author would need to describe the process of selecting certain correlation matrix and explain the reasons. 3. Another important aspect is missing. As GEE can only estimate unbiased estimation with missing completely at random, it is unclear how many missing exist in the dataset and how the authors dealt with those missing. 4. Also, it is not clear whether the data has been weighed if the author would consider it to be nationally representative. Discussion 5. Page 16, line 16: The authors claimed that “research on the association between healthy lifestyle and quality of life is still lacking”, which is not the case. Research on this association is enormous. Just to give few examples:

	Danson, S. J., Rowland, C., Rowe, R., Ellis, S., Crabtree, C., Horsman, J. M., ... & Eiser, C. (2016). The relationship between smoking and quality of life in advanced lung cancer patients: a prospective longitudinal study. Supportive Care in Cancer, 24(4), 1507-1516. Feng, Z., Cramm, J.M. & Nieboer, A.P. Social participation is an important health behaviour for health and quality of life among chronically ill older Chinese people. BMC Geriatr 20, 299 (2020). Garces, Y. I., Yang, P., Parkinson, J., Zhao, X., Wampfler, J. A., Ebbert, J. O., & Sloan, J. A. (2004). The relationship between cigarette smoking and quality of life after lung cancer diagnosis. Chest, 126(6), 1733-1741. Govindaraju, T., Sahle, B. W., McCaffrey, T. A., McNeil, J. J., & Owen, A. J. (2018). Dietary patterns and quality of life in older adults: a systematic review. Nutrients, 10(8), 971. Potter, R., Ellard, D., Rees, K., & Thorogood, M. (2011). A systematic review of the effects of physical activity on physical functioning, quality of life and depression in older people with dementia. International journal of geriatric psychiatry, 26(10), 1000-1011. Rejeski, W. J., & Mihalko, S. L. (2001). Physical activity and quality of life in older adults. The Journals of Gerontology Series A: Biological sciences and medical sciences, 56(suppl_2), 23-35. Sánchez, P. H., Ruano, C., De Irala, J., Ruiz-Canela, M., Martínez-González, M. A., & Sánchez-Villegas, A. (2012). Adherence to the Mediterranean diet and quality of life in the SUN Project. European Journal of Clinical Nutrition, 66(3), 360-368.

REVIEWER	Ward, Mark University of Dublin Trinity College, The Irish Longitudinal Study of Ageing
REVIEW RETURNED	08-Mar-2021

GENERAL COMMENTS	This is a good paper with interesting, clearly defined hypotheses. The literature review is fine and the aim of the analysis is clear. Many parts of the manuscript requires English language editing. There are too many errors to list them all but the first sentence is typical: "In recent years, the general trend toward an ageing population worldwide has increas[ed]ing exponentially. Between 2015 and 2050, the proportion of the world's population over 60 years is expected to [increase] from 12% to 22% according to the World Health Organization (WHO [Full citation needed])." The meaning is mostly clear, it just needs to be edited. Page 3 line 53. "Many people believe that rather than living longer, quality of life (QOL) is more important". This is not an either or scenario. The point is that as people live longer we should ensure that the extra years gained are characterized by good QoL. Not everyone will be familiar with the Korean Longitudinal study of Aging (KLoSA) so more information should be provided about that study - sample size, sampling method, data collection method. I assume the frequency is every two years. As well as these basics, please provide references to papers that describe the KLoSA study in detail e.g. study protocol or similar, cohort description or similar.

	The alcohol indicator is quite weak as it doesn't capture either frequency or amount consumed. I assume this is a data limitation so not possible for the authors to do anything about. However, it is a weakness so should be acknowledged as a limitation. Page 6 line 24. Can you please include a sentence to describe the lag function. I am no familiar with it and a quick Google search hasn't helped me. Is there any reason why the authors did not use some form of cluster analysis to assign 'healthy lifestyle scores" e.g. the Conry et al paper cited. As done here, each behaviour has the same weight which is a little crude, even more so when you consider the limited alcohol indicator. This approach could be used in conjunction with a latent class growth model to identify latent 'healthy lifestyle" longitudinal trajectories. At a minimum I would like to see a justification provided for the approach taken). Related to this, I am curious as to what the main drivers in changes to healthy lifestyle were. Is it mainly changes to physical activity or another indicator? At a minimum I suggest the authors include a table showing the % in each lifestyle indicators e.g. % smoker, % past smoker etc. I am not entirely clear how many waves of data are included in the analysis. From page 6 line 13 I thought six waves were included but Table 1 suggests it was only 2006 to 2008. Please provide more details on the data structure - how many waves, what waves were indicators taken from. Related to this, there is no mention of missing data or how it was handled? I assume there was attrition between waves? Tables 1 to 3 are terribly difficult to read in their current form, particularly Table 1. Table 4. It is curious that both smoking and alcohol are more strongly associated with QoL rather than HrQoL. This should be discussed more. Please do not use the term 'elderly' (page 17 line 8 and 51). It is considered derogatory.

VERSION 1 – AUTHOR RESPONSE

Revision Note

Association between healthy lifestyle score changes and quality of life and health related quality of life: a longitudinal analysis of South Korean panel data

We were pleased to have the opportunity to revise our paper. In revising our paper, we have carefully considered your comments and suggestions. As instructed, we have attempted to explain the changes made in reaction to all the reviewer's comments. The reviewer's comments were very helpful overall, and we appreciate the constructive feedback on our original submission. After addressing the issues raised, we feel the quality of the paper has greatly improved and we hope you agree. Our response to each comment is as follows, and

we attach a revision note, revised sections of the manuscript. Again, thank you for the valuable and helpful comments.

Response to Reviewer #1's comments

Comments and Suggestions for Authors

Methods

1. I have several concerns regarding the choice of generalized estimating equation (GEE) model. GEE is can only provide valid results for a short period. However, the current study involved ten years of observation (from 2006 to 2016), which is considered a long period. Therefore, I am concerned about the use of GEE for this longitudinal dataset.

Firstly, thank you very much for taking the time to provide us with your valuable comments. Although our study included ten year observed data, the nature of the KLoSA is longitudinal panel data which consists of repeated measurements of the same respondents collected every two years from 2006. Therefore, we believe that GEE is an appropriate method of analysis for repeated-measure data employed in our study. We have accordingly clarified this by revising our methodology section of our manuscript to include this point. All changes were highlighted accordingly in our text. Thank you for your meaningful comments.

Revised manuscript, line 176-181: The GEE is considered an extension of the generalised linear model and allows for analysis of repeated panel data such as the KLoSA by taking within-subject correlation into account and produces estimates based on the mean regression parameters.17 Data from a total of six waves (2006–2016) were used in this study, and thus, repeated measurements for each participant were conducted up to five times.

2. Also, it is unclear which working correlation matrix was chosen for GEE? The author would need to describe the process of selecting certain correlation matrix and explain the reasons.

Thank you once again for your meaningful comments and suggestions. The correlation matrix employed for the GEE analysis of our study was the unstructured (UN) correlation matrix. Our criterion for selection of the working correlation structure was based on the quasi-likelihood QIC, and the structure with the best fit was the unstructured working correlation. The UN correlation structure estimates all possible correlations between within-subject responses and includes them in the estimation of the variances and is often considered the least restrictive covariance structure. We have taken your comment into account and have clarified this in our methods section. All changes were highlighted accordingly. Thank you for your helpful comments.

Revised manuscript, line 174-176: 2-year lagged multivariable generalised estimating equation (GEE) model with an unstructured working correlation was used to longitudinally examine impact of healthy lifestyle score changes on HRQOL and QOL, after controlling for confounders.

3. Another important aspect is missing. As GEE can only estimate unbiased estimation with missing completely at random, it is unclear how many missing exist in the dataset and how the authors dealt with those missing.

Thank you very much for your careful revision and comments. We have revised and made changes as per your comment. We have accordingly added a flowchart of selection process of our study's participants and elaborated further in our methods. The exclusion criteria included those with missing

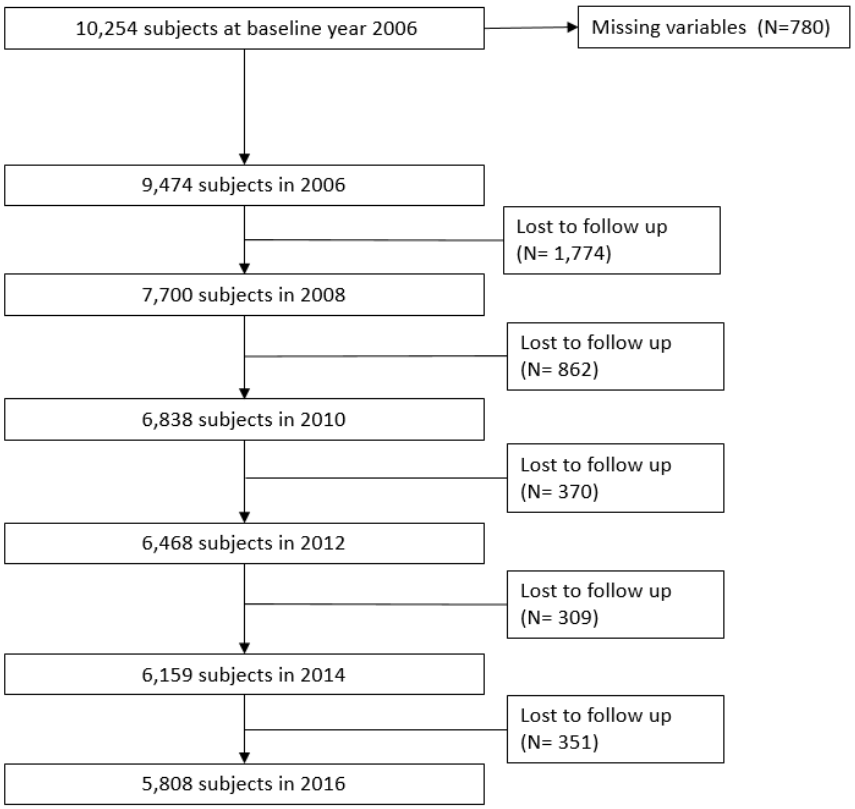
or incomplete data. In addition, due to an error on our part in selection and construction of one of the variables in our data analysis, many missing participants arose leading to a small final sample of participants. After reanalysing our data and changing our drinking alcohol variable to include heavy drinking due to comment given by another reviewer, the final number of participants increased significantly. Nevertheless, the association between healthy lifestyle changes and HRQOL/QOL remained significant in both sexes. All changes were highlighted accordingly in our text. Thank you once again for your comments.

Revised manuscript, line 107-113: The number of participants included in the original survey in 2006 was 10,254, followed by 8,875 in 2008, 8,229 in 2010, 7,813 in 2012, 8,387 in 2014, and 7,893 participants in 2016. More information about the survey can be found on the panel survey organisation website (https://survey.keis.or.kr/eng/klosa/klosa01.jsp). After excluding those with missing data and those who failed to follow up, a total of 9,274 participants were included in our study. The detailed flow of the participants in our study is depicted in Figure 1.

Revised manuscript, line 128-133: Drinking status: never or past drinker was classified as optimal; current drinking behaviour was further classified using the CAGE questionnaire (cutting down, annoyance by criticism, guilty feeling, and eye-openers) provided in the KLoSA. If the current drinker answered 'yes' to one or none of the questions, they were classified as normal drinkers (intermediate); otherwise, they were classified as heavy drinkers (poor)14.

Added Figure: Figure 1

Figure 1. Flowchart of the study participants from 2006-2016.



4. Also, it is not clear whether the data has been weighed if the author would consider it to be nationally representative.

Thank you very much for your meticulous comments. Although we did not assign weights when using the KLoSA panel data, the KLOSA survey ensured national representativeness by using a multistage sampling technique to randomly select participants aged 45 years and older from all regions in Korea apart from Jeju Island. We have further clarified this in the methodology section of our manuscript. All changes were highlighted in our text accordingly. Thank you once again for your meaningful review.

Revised manuscript, line 102-107: Since 2006, the Korea Labor Institute has collected nationally representative data through use of multi-stage, stratified probability sampling design to randomly select participants from all regions in Korea with the exception of Jeju Island. The KLoSA panel data was established through repeated surveys in the same sample biennially, thereby reflecting trends over time in middle-aged and older residents aged 45 years or older residing in Korea.12

Discussion

5. Page 16, line 16: The authors claimed that “research on the association between healthy lifestyle and quality of life is still lacking”, which is not the case. Research on this association is enormous. Just to give few examples:

Danson, S. J., Rowland, C., Rowe, R., Ellis, S., Crabtree, C., Horsman, J. M., ... & Eiser, C. (2016). The relationship between smoking and quality of life in advanced lung cancer patients: a prospective longitudinal study. Supportive Care in Cancer, 24(4), 1507-1516.

Feng, Z., Cramm, J.M. & Nieboer, A.P. Social participation is an important health behaviour for health and quality of life among chronically ill older Chinese people. BMC Geriatr 20, 299 (2020).

Garces, Y. I., Yang, P., Parkinson, J., Zhao, X., Wampfler, J. A., Ebbert, J. O., & Sloan, J. A. (2004). The relationship between cigarette smoking and quality of life after lung cancer diagnosis. Chest, 126(6), 1733-1741.

Govindaraju, T., Sahle, B. W., McCaffrey, T. A., McNeil, J. J., & Owen, A. J. (2018). Dietary patterns and quality of life in older adults: a systematic review. Nutrients, 10(8), 971.

Potter, R., Ellard, D., Rees, K., & Thorogood, M. (2011). A systematic review of the effects of physical activity on physical functioning, quality of life and depression in older people with dementia. International journal of geriatric psychiatry, 26(10), 1000-1011.

Rejeski, W. J., & Mihalko, S. L. (2001). Physical activity and quality of life in older adults. The Journals of Gerontology Series A: Biological sciences and medical sciences, 56(suppl_2), 23-35.

Sánchez, P. H., Ruano, C., De Irala, J., Ruiz-Canela, M., Martínez-González, M. A., & Sánchez-Villegas, A. (2012). Adherence to the Mediterranean diet and quality of life in the SUN Project. European Journal of Clinical Nutrition, 66(3), 360-368.

Thank you very much for your valuable review. We totally agree with your comment that research regarding various types of health behaviours and quality of life may be quite extensive. We have therefore taken your comment into account and edited the sentence in question. All changes were highlighted in our text accordingly. Thank you once again for your helpful comments.

Revised manuscript, line 231-233: Although a plethora of studies used individual assessments of health behaviours, these may have provided incomplete estimation of the contribution of a healthy lifestyle to QOL.20

Revised manuscript, line 237-242: Our study has important methodological implications as research that demonstrates a relationship between changes in health behaviours over time (especially using a composite lifestyle score) in older people and quality of life requires further exploration. Considering that a majority of prior studies used single or stationary assessments of health behaviours, observing the influence of dynamic change of an aggregate of different health behaviours over time on quality of life may provide novel information.

Additional revision(s):

1. Besides our replies to the reviewer's specific comments, any additional changes in our manus cript were highlighted accordingly.

2. Our manuscript has undergone thorough and extensive English language editing by professio nal English editing services, Editage.

Revision Note

Association between healthy lifestyle score changes and quality of life and health related quality of life: a longitudinal analysis of South Korean panel data

We were pleased to have the opportunity to revise our paper. In revising our paper, we have carefully considered your comments and suggestions. As instructed, we have attempted to explain the changes made in reaction to all the reviewer's comments. The reviewer's comments were very helpful overall, and we appreciate the constructive feedback on our original submission. After addressing the issues raised, we feel the quality of the paper has greatly improved and we hope you agree. Our response to each comment is as follows, and we attach a revision note, revised sections of the manuscript. Again, thank you for the valuable and helpful comments.

Response to Reviewer #2's comments

Comments and Suggestions for Authors

Many parts of the manuscript requires English language editing. There are too many errors to list them all but the first sentence is typical:

"In recent years, the general trend toward an ageing population worldwide has increas[ed]ing exponentially. Between 2015 and 2050, the proportion of the world's population over 60 years is expected to [increase] from 12% to 22% according to the World Health Organization (WHO [Full citation needed])."

The meaning is mostly clear, it just needs to be edited.

Firstly, thank you very much for your taking the time to provide us with such a detailed review. We have taken your suggestion into account and had our manuscript checked by professional English language editing services. All changes were highlighted accordingly in our text. Thank you once again for your helpful suggestions and comments.

Revised manuscript, line 63-66: In recent years, the general trend toward an aging population has increased exponentially worldwide. Between 2015 and 2050, the proportion of the world's population over 60 years is expected to increase from 12% to 22%, according to the World Health Organization (WHO).1

Page 3 line 53. "Many people believe that rather than living longer, quality of life (QOL) is more important". This is not an either or scenario. The point is that as people live longer we should ensure that the extra years gained are characterized by good QoL.

Thank you once again for your meaningful comments. We totally agree with your comment that the wording of this sentence may be a little off and that both length and quality of life are equally important. All changes were highlighted accordingly in our text. Thank you for your helpful comments.

Revised manuscript, line 70-71: Additionally, many people believe that a good quality of life (QOL) is equally important as the length of life.

Not everyone will be familiar with the Korean Longitudinal study of Aging (KLoSA) so more information should be provided about that study - sample size, sampling method, data collection method. I assume the frequency is every two years. As well as these basics, please provide references to papers that describe the KLoSA study in detail e.g. study protocol or similar, cohort description or similar.

Thank you very much for your careful revision and comments. We have taken your suggestion into account and elaborated more about the KLoSA survey used in our study and added a reference. All changes were highlighted in our text accordingly. Thank you for your comments/

Revised manuscript, line 102-110: Since 2006, the Korea Labor Institute has collected nationally representative data through use of multi-stage, stratified probability sampling design to randomly select participants from all regions in Korea with the exception of Jeju Island. The KLoSA panel data was established through repeated surveys in the same sample biennially, thereby reflecting trends over time in middle-aged and older residents aged 45 years or older residing in Korea.12 The number of participants included in the original survey in 2006 was 10,254, followed by 8,875 in 2008, 8,229 in

2010, 7,813 in 2012, 8,387 in 2014, and 7,893 participants in 2016. More information about the survey can be found on the panel survey organisation website (https://survey.keis.or.kr/eng/klosa/klosa01.jsp).

The alcohol indicator is quite weak as it doesn't capture either frequency or amount consumed. I assume this is a data limitation so not possible for the authors to do anything about. However, it is a weakness so should be acknowledged as a limitation.

Thank you very much for your helpful comments and suggestions. We totally agree with your comment that classifying drinking behaviour as current, past and none drinking may be a bit lacking. We have therefore utilised the CAGE questions provided in the KLoSA survey to classify current drinking as normal drinking (intermediate) and heavy drinking (poor). We also included your suggestion in our study's limitations. All changes were highlighted accordingly in our text. We believe that our manuscript has greatly improved through your comments and suggestions. Thank you once again for your meaningful comments.

Revised manuscript, line 128-133: 2) Drinking status: never or past drinker was classified as optimal; current drinking behaviour was further classified using the CAGE questionnaire (cutting down, annoyance by criticism, guilty feeling, and eye-openers) provided in the KLoSA. If the current drinker answered 'yes' to one or none of the questions, they were classified as normal drinkers (intermediate); otherwise, they were classified as heavy drinkers (poor)14.

Revised manuscript, line 285-289: Last, we used self-reported measures of health behaviours. The use of objective measures of health behaviours, such as verifying smoking using urine cotinine, actigraphs for physical activity,37 and accurate measurements of the amount and frequency of alcohol consumption might have yielded more precise estimates of a healthy lifestyle.

Page 6 line 24. Can you please include a sentence to describe the lag function. I am no familiar with it and a quick Google search hasn't helped me.

Thank you for your meaningful comments. As per your comment, we have explained and clarified on how we used a lagged GEE model to investigate influence of 2 – year change in healthy lifestyle score on HRQOL and QOL. All changes were highlighted accordingly in our text. Thank you for your careful and helpful review.

Revised manuscript, line 141-143: We detected 2-year changes in participants' healthy lifestyle by investigating the lagged healthy lifestyle score in the prior year and scores in the following year over 2 consecutive years (2006–2008, 2008–2010, 2010–2012, 2012–2014, and 2014–2016).

Is there any reason why the authors did not use some form of cluster analysis to assign 'healthy lifestyle scores" e.g. the Conry et al paper cited. As done here, each behaviour has the same weight which is a little crude, even more so when you consider the limited alcohol indicator. This approach could be used in conjunction with a latent class growth model to identify latent 'healthy lifestyle" longitudinal trajectories. At a minimum I would like to see a justification provided for the approach taken).

Thank you for your valuable comments. While we agree with your comment that a latent class growth model and a cluster analysis approach may be useful to identify trajectories of healthy lifestyle, the aim of this study was to investigate effect of short-term changes of healthy lifestyle behaviours on HRQOL and QOL. Therefore we decided use of lagged GEE model to conduct our data analysis was appropriate for our study. We hope we have clarified on why we used this particular method for our data analysis. Thank you once again for your comments.

Revised manuscript, line 174-179: 2-year lagged multivariable generalised estimating equation (GEE) model with an unstructured working correlation was used to longitudinally examine impact of healthy lifestyle score changes on HRQOL and QOL, after controlling for confounders. The GEE is considered an extension of the generalised linear model and allows for analysis of repeated panel data such as the KLoSA by taking within-subject correlation into account and produces estimates based on the mean regression parameters.17

Related to this, I am curious as to what the main drivers in changes to healthy lifestyle were. Is it mainly changes to physical activity or another indicator? At a minimum I suggest the authors include a table showing the % in each lifestyle indicators e.g. % smoker, % past smoker etc.

Thank you for your meaningful comments. We have accordingly added a table showing number and percentage % in each healthy lifestyle indicator as a supplement. Thank you for valuable suggestions and comments.

Added Table: Supplementary Table 1

Supplementary Table 1. Number of participants in each component of health lifestyle score in baseline year 2006-2008

Variables	N	(%)
Total	**7,700**	**(100.0)**
Physical activity status[a]		
Poor	4,886	(63.5)
Intermediate	581	(7.5)
Optimal	2,233	(29.0)
BMI status[b]		
Poor	1,960	(25.5)
Intermediate	2,306	(29.9)
Optimal	3,434	(44.6)
Smoking status[c]		
Poor	1,402	(18.2)
Intermediate	944	(12.3)
Optimal	5,354	(69.5)
Drinking status[d]		
Poor	443	(5.8)
Intermediate	2,421	(31.4)
Optimal	4,836	(62.8)

a For Physical activity; exercising more than 150 min weekly (Optimal), less than 150 min (Intermediate) and never (Poor)
b For BMI; BMI higher than 25 kg/m2, as well as underweight BMI of less than 18 kg/m2 (Poor), Overweight BMI of 23-24.9 kg/m2, (Intermediate), and 18-22.9 kg/m2 (Optimal)
c For Smoking; never smokers (Optimal), past smokers (Intermediate) and current smokers (Poor)
d For Drinking; never or past drinkers (Optimal), normal current drinker (Intermediate) and heavy current drinkers (Poor)

I am not entirely clear how many waves of data are included in the analysis. From page 6 line 13 I thought six waves were included but Table 1 suggests it was only 2006 to 2008. Please provide more details on the data structure - how many waves, what waves were indicators taken from.

Thank you once again for your careful revision and comments. We apologise for confusion that arose due to incomplete explanation on our part. This study used a total of six waves (2006- 2016) and data was taken from all of the waves. Table 1 shows the general characteristics of population at the baseline (2006 -2008) which was also the first time point of measurement of healthy lifestyle score changes and HRQOL/QOL. We have added more information and elaborated on this further in our manuscript. Thank you for your helpful comments.

Revised manuscript, line 179-181: Data from a total of six waves (2006–2016) were used in this study, and thus, repeated measurements for each participant were conducted up to five times.

Revised manuscript, line 186-187: Table 1 lists the general characteristics of the population of 7,700 people at the first time point of change in healthy lifestyle score, which was the baseline period of 2006–2008.

Related to this, there is no mention of missing data or how it was handled? I assume there was attrition between waves?

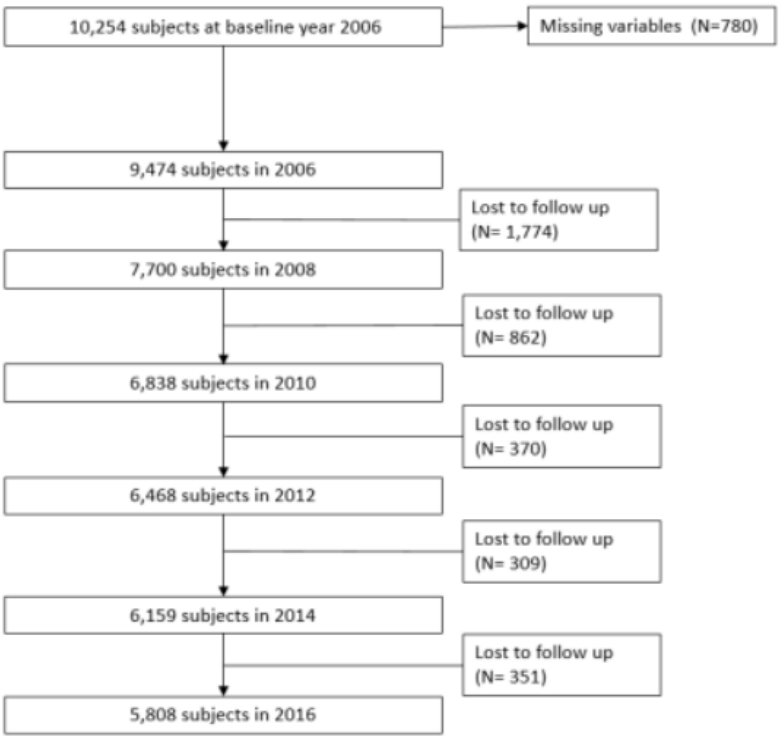
Thank you very much for your careful revision and comments. We have revised and made changes as per your comment. We have accordingly added a flowchart of selection process of our study's participants and elaborated further in our methods. The exclusion criteria included deleting those with missing or incomplete data. In addition, due to an error on our part in selection and construction of one of the variables in our data analysis, many missing participants arose leading to a small final sample of participants. After reanalysing our data and changing our drinking alcohol variable to include heavy drinking due to comment given by aother reviewer, the final number of participants increased significantly. Nevertheless, the association between healthy lifestyle changes and HRQOL/QOL remained significant in both sexes. Also, as we used panel data, attrition between waves is inevitable. We have decided to add this to our study's limitations. All changes were highlighted accordingly in our text. Thank you once again for your comments.

Revised manuscript, line 110-113: After excluding those with missing data and those who failed to follow up, a total of 9,274 participants were included in our study. The detailed flow of the participants in our study is depicted in Figure 1.

Revised manuscript, line 284-285: Fourth, as we used panel data, missing arising from loss of participants due to attrition is inevitable.

Added Figure: Figure 1

Figure 1. Flowchart of the study participants from 2006-2016.



Tables 1 to 3 are terribly difficult to read in their current form, particularly Table 1.

We would like to apologize for any inconvenience caused by the presentation of tables in our manuscript. We have edited and revised our tables as per your comment. We hope through this revision, we were able to make reading and interpreting our tables easier for the reviewers and readers alike. All changes were highlighted accordingly in our text. Thank you once again for your valuable comments.

Table 4. It is curious that both smoking and alcohol are more strongly associated with QoL rather than HrQoL. This should be discussed more.

Thank you for your helpful comments and suggestions. We have accordingly expanded more on the point you mentioned in our study's discussion as per your instruction. All changes were highlighted accordingly in our text. Thank you for your valuable comments.

Revised manuscript, line 264-275: Current smoking has been reported significantly associated with decreased QOL among older adults.32-34 Similar to our main findings, continuous smoking (Low–Low) over a span of two years showed a greater association with poor QOL than HRQOL. A prior smoking cessation trial study compared the effects of quitting smoking vs continuing smoking on both HRQOL and global QOL. Results suggested that compared to continuing smoking, quitting smoking showed improvement in both HRQOL and global QOL, despite the association being stronger with HRQOL which was different from our present study.22 Our study also revealed that constant heavy drinking showed the lowest estimates of HRQOL and QOL, but its relationship with QOL was stronger and showed statistically significant values. A study conducted in the Norwegian general population reported that excessive drinking had the poorest QOL in various domains, namely psychological, social relationships and environmental, rather than the physical health domain.35

Please do not use the term 'elderly' (page 17 line 8 and 51). It is considered derogatory.

Thank you very much for your valuable comments. We apologise for the inappropriate use of the term 'elderly' as it may be deemed offensive. As per your instruction, we have accordingly changed the expression to 'older adults' throughout our manuscript. In addition, we had our manuscript edited and checked by professional English language services to avoid use of any problematic terms or expressions. We are very grateful for your helpful and meticulous efforts to improve our manuscript.

Additional revision(s):

Besides our replies to the reviewer's specific comments, any additional changes in our manuscript were highlighted accordingly.

VERSION 2 – REVIEW

REVIEWER	Ward, Mark University of Dublin Trinity College, The Irish Longitudinal Study of Ageing
REVIEW RETURNED	23-Jul-2021

GENERAL COMMENTS	I wish to thank the authors for their thorough review of the manuscript. They have responded fully to each of my comments.