Author's response to reviews

Title: Vertebral fractures and self-perceived health in elderly women and men: The Tromso Study, a population-based cross-sectional study

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Author's response to reviews: see over
Dear Irene Pala,

Thank you very much in deed, for allowing us to make further improvements to our manuscript (MS: 9387028018077352). We have made a major revision of our manuscript according to the comments from the Editorial Board member. Please find enclosed the revised version of our manuscript, and please note the changes we have made to the title.

Based on the comments, we have made the following changes to the manuscript:

**Comment 1:** "The sample includes persons aged 38 to 78. The authors need to either drop those aged less than 50 or 65, or classify the sample into < age 65 and age 65". **Answer:** We excluded all participants below the age of 50 years from the analyses and remained with 1177 men and 1615 women in analyses (instead of 1206 men and 1681 women). If we classify the sample into the suggested categories < age 65 and age 65”, we will lose power, as there are only 56 vertebral fractures in women and 54 in men below 65. We have corrected all tables according to the new age sample (50 years and above). Please see the revised version.

**Comment 2:** “According the title, this is a cross-sectional study. Yet I am told by the authors on Page 4 that this study is a longitudinal study. Please also refer to Points 5 and 6 below”. **Answer:** We acknowledge that we are unclear about this issue in the text. The Tromsø Study is a longitudinal population-based study with surveys conducted every 6-7 years, altogether 6 surveys. Vertebral morphometry was conducted for the first time, in the 2007-08 survey. We have tried to clarify this in the text, and changed the title accordingly: “Vertebral fractures and self-perceived health in elderly women and men in a population-based cross-sectional study: The Tromsø Study 2007-08”. Please see the revised version.
Comment 3: “Abstract, Methods: What are EQ-5D-3L and EQ VAS? Authors need to either spell them out or provide the developer/proposer/creator. Please specify what is the multiple regression.” Answer: We acknowledge our inconsistency in the text, and we have revised the abstract, please see the revised version of the abstract and the method chapter.

Comment 4: “Background is too weak and needs to be strengthened. There is nothing about the association between vertebral fracture and self-perceived health (SPH) (or HRQ) nor gender issue in the current version, which should be added to echo the title. Even if there is no literature on the association between vertebral fracture and SPH/HRQL, the importance of SPH in old ages and the associated factors especially with pain should be reviewed. The authors noted that there have been some studies with small sample size talking about vertebral and HRQL. What are the major findings of these studies?” Answer: We agree that the background for our study should be strengthened. In the revised version we have clarified the important association between health related quality of life (HRQL) and increased risk of mortality in the elderly. We have furthermore elaborated what is known about the association between vertebral fractures and HRQL, and specified the research questions. Please see the revised version.

Comment 5: “Page 4 1st paragraph: The authors need to provide more information about six repeated surveys? Especially, how these six repeated surveys recruit patients each time? What is the sample size in each survey? Are the samples same or most of them the same? how long between phrase 1 and phase 2 of each survey?” Answer: In the revised version we have provided more information of the Tromsø Study itself, the survey conducted in 2007-08 (Tromsø VI), and clarified attendance and the distinction between phase 1 and 2.

Comment 6: “Page 4, 2nd paragraph: I assume the numbers in the parentheses are participation rates. If so, they should be stated. In the phrase of 2007/08, there are 11484 subjects. Yet the summation of men (3141) and women (4166) was not equal to that number.” Answer: in the revised version of the manuscript we have tried to make these point more clear: A total of 11484 subjects were invited for phase 2, and with an attendance rate of 63.6 % a total of 7307 persons attended phase 2 ( 3141 men and 4166 women). Please see the revised version.

Comment 7: “Page 5: What does GE stand for?” Answer: GE stands for General Electric. GE Healthcare is a division of GE Technology Infrastructure, which is itself a division of General Electric (GE). In the revised manuscript we have kept the densitometer name/brand which is GE Lunar Prodigy, with an explanation added (please see the revised version).

Comment 8: “Page 7: The authors applied the Bonferroni correction in ANOVA, which is good. But the authors need to tell readers the purpose of the application of that correction.” Answer: We have added the explanation in the revised version.

Comment 9: “Page 7: I think ANOVA should be ANCOVA because there are some covariates in the model.” Answer: We have added the correction in the revised version, thank you for noting the mistake.

Comment 10: “Discussion: I suggest dropping two subtitles.” Answer: We have dropped the subtitles.
Comment 11: “Tables: All tables should have table notes. Tables 1 and 2 should have a note to tell readers the statistical method used for p values and specific groups for comparisons. OR and Beta in Table 3 should be noted in a table note for their meanings and statistical methods. Again, in ANOVA/ANCOVA, basic demographics and health behavioral factors should be taken into consideration. Otherwise, the results are less meaningful. The authors need to note that is "Data analysis." Answer: We have included table notes with statistical methods used and included comments about how basic demographics and health behavioral factors are taken into consideration in ANOVA/ANCOVA.

Other changes: In table 3 we are now reporting OR as effect of vertebral fractures (changed the initial one – showing the protective effect when no fracture was observed). In addition we have extended the discussion, please see the revised version with changed highlighted in yellow.

On behalf of my co-authors
and with best regards,

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