Author's response to reviews

Title: Hip fracture risk in relation to vitamin D supplementation and serum 25-hydroxyvitamin D levels: A systematic review and meta-analysis of randomised controlled trials and observational studies.

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Author's response to reviews: see over
Dear Editor,

Please find enclosed our paper, entitled:

**Hip fracture risk in relation to vitamin D supplementation and serum 25-hydroxyvitamin D levels: A systematic review and meta-analysis of randomised controlled trials and observational studies.**

for consideration for publication in *BMC Public Health*.

We would like to thank the reviewers for the constructive comments we have received. We have considered each comment and have outlined the changes we have made in response attached.

This paper is not being considered for publication elsewhere, and we very much hope you will find it suitable for consideration for *BMC Public Health*. Please do not hesitate to contact me at jeffrey.lai@anu.edu.au or +61 411 413 888 if you require anything further.

With best wishes,

Yours sincerely,

Mr Jeffrey Lai  Dr Robyn Lucas  Dr Mark Clements  Dr. Andrew Roddam  A/Prof Emily Banks

on behalf of the authors
Reviewer 1

Minor Essential Revisions

1. In the Materials and methods, page 6, the authors stated that they used a logarithmic transformation with geometric mean and standard error estimated using asymptotic Taylor series approximation. It would be advisable to explain why this choice was necessary.

We have included a note on the rationale of using the logarithmic transformation. We note that the Taylor series approximation was necessary to convert the arithmetic mean and standard error reported in most studies into the necessary geometric mean and standard error on the transformed log scale.

2. Please check and correct totals in figure 2.

A misprint was found in a single figure of the totals column of figure 2. This has been corrected.

Discretionary Revisions

1. Inclusion and exclusion criteria may be described in the Materials and Methods, avoiding the use of bullet lists.

The inclusion and exclusion criteria have been rewritten without bullet lists.

2. I suggest to show in tables 1-3 the mean age of the subjects in each study (when available); this would be a useful information on the populations under investigation.

We note that the mean age of populations under investigation are already included in both Tables 1 (see column 3) and 2 (see column 3 and 6). We have added the mean age in Table 3 as suggested.

Reviewer 2

Minor Essential Revisions:

1. Background, page 3, last line: “this is the first meta-analysis of observational studies on this topic”. I think it would be more appropriate to use the word case-control studies instead of just observational studies since, which can be misunderstood since the authors did not use cohort data in the meta-analysis. Same problem in the strength and weakness section on page 11, 1st paragraph.

We have changed the “observational studies” to “case-control studies” as suggested.

2. Statistical Analysis and presentation of results, page 6: 5th line, please give a couple of lines on how you conducted the sensitivity analysis.
We have included that the test used was a standard unequal variance T-test and have reported the associated p-value.

3. Statistical Analysis and presentation of results, page 6: Last few lines of the first paragraph: Please specify the level of H statistic that you used and define I2 statistic.

We have noted the level used to determine heterogeneity using the H and I2 statistic and also a definition of the I2 statistic with reference to the concept it represents and the paper in which it was originally derived.

4. Discussion, strengths and limitation, page 11: One limitation could be measurement error in serum vitamin D measurements and misclassification bias. Another limitation could be publication bias.

We have noted these potential limitations in the text.

5. The title of the paper may not be appropriate. Authors only state vitamin D supplementation without any mention of serum vitamin D but then they included the term meta-analysis of observational studies, which examined only serum vitamin D. Its confusing… If the authors prefer to highlight the results from RCTs then I suggest they drop the term observational studies from the title or re-think the title of the paper.

We have changed the title to include reference to both vitamin D supplementation and also serum 25(OH)D levels.

We have additionally included a few other minor changes to the manuscript. All changes are shown in the manuscript in red text.