Title: Bone mineral density, body mass index and cigarette smoking among Iranian women: Implications for prevention

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Author's response to reviews: see over
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The Editorial Team
BMC Musculoskeletal Disorders

Dear Editorial Team,

Ref: Ms: 7837286305676117
Re: Bone mineral density, body mass index and cigarette smoking among Iranian women: Implications for prevention

Thank you for your e-mail dated 16/3/2005 together with the Reviewers’ comments on the above manuscript. We have carefully considered the Reviewers’ comments and have addressed them in the following attachment. We have also modified parts of the manuscript to take into account the Reviewers’ concern. We hope that our response and the revised manuscript are satisfactory to you and suitable for publication in the Journal.

We look forward to hearing from you.

Yours sincerely,

Azam Baheiraei
Response to Reviewer 1

Thank you for taking time to review our manuscript. We appreciate the Reviewer’s positive general comments. We would like to take this opportunity to address the Reviewer’s comments as follows:

**Major Compulsory Revisions**

1. We agree with the Reviewer, and have changed the expression “non-Western Caucasians” in the manuscript to read “Caucasians of non-European origin” (Abstract, second and last lines and page 3 paragraph 2).

2. We share the Reviewer’s concern of the potential effect of acculturation on the study’s results, and have added a sentence in the Discussion section (page 10 last paragraph and page 11 first paragraph).

3. We have clarified the BMI criteria in the Methods section (page 5 paragraph 2).

4. We have provided the range of postmenopausal duration (page 7 paragraph 2).

5. The subjects were recruited using a media campaign, followed by a telephone interview to identify women who met the inclusion and exclusion criteria for the study. Of the 96 women who agreed to have BMD measured and participated in the current study, 6 women did not meet the study’s criteria and were excluded from the analysis. The basic clinical and demographic characteristic of the 6 women were not significantly different from those who were included in the analysis. We have added a sentence in the Methods section (page 4 paragraph 3) to clarify this issue. The following Table shows the characteristics of participants compared with excluded subjects:

<table>
<thead>
<tr>
<th></th>
<th>Participants (mean)</th>
<th>Excluded subjects (mean)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>48.5</td>
<td>52.1</td>
<td>0.30</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>156.5</td>
<td>155.5</td>
<td>0.66</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>70.0</td>
<td>68.6</td>
<td>0.81</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>28.6</td>
<td>28.3</td>
<td>0.91</td>
</tr>
</tbody>
</table>

6. The Reviewer is correct: the figure for the adjusted difference in BMD between smokers and non-smokers show in the text was rounded to 2 dp. The actual number is 0.087 g/cm², and we have rounded to 0.09 g/cm² (page 7 last line).
7. Thank you for raising this point. We have rewritten the indicated sentence in the Result section to read “current smokers had significantly lower lumbar spine and femoral neck BMD than non-smokers. However, there was no significant difference between ex-smokers and non-smokers in both BMD sites” (page 8 first paragraph).

8. The diagnosis of osteoporosis is partly based on the measurement of BMD at the lumbar spine and femoral neck. In this study we found that osteoporosis was more likely to be detected from the lumbar spine BMD rather than the femoral neck BMD. This finding is consistent with another study in Iran which we have referred to in the manuscript. However, the prevalence of osteoporosis at the femoral neck seemed to be lower in Iranian women compared with most Asian and other Caucasian populations. We therefore suggest that this discrepancy should be further investigated (page 10 paragraph 3).

9. We have included a sentence in the footnote to explain the meaning of the regression coefficient in Table 3.

10. The number of women in each bar is now indicated in Figure 2.

**Minor Essential Revisions**

1. The asterisk sign (*) in Table 1 is now explained.

2. IQR has been explained in Table 1 to read “interquartile range”.
Response to Reviewer 2

We appreciate the Reviewer for taking time to consider our manuscript. We would like to address the points were raised by the Reviewer as follows:

**Major Compulsory Revisions**

1. The Reviewer expresses a concern on the sample size and age range in the study. However, the fact that significant effects of smoking and BMI on BMD were found suggests that the study was adequate in power for an analysis of association between these risk factors and BMD. Furthermore, our estimate of the prevalence of osteoporosis in postmenopausal women (26%) is highly consistent with a previous study (Rassouli A, Milanian I, Moslemi-Zadeh M: Determination of serum 25-hydroxyvitamin D (3) levels in early postmenopausal Iranian women: relationship with bone mineral density. *Bone* 2001, 29:428-30) and is also agreeable to estimates from other Caucasian populations. This suggests that our result is fairly robust. However, the Reviewer is correct that the calculation of average T-scores could be affected by the distribution of young and old individuals in the sample, and this is precisely the reason we have estimated the prevalence for pre- and post-menopausal women separately (pages 8, 9 and 10). We consider that an evaluation of power after a study has been done is not meaningful. For a statistically significant result \( p < 0.05 \) the post hoc power is irrelevant. For a non-significant result \( p > 0.05 \), the post hoc power is always low and provides no further information than the \( p \) value does (JM Hoering and DM Heisy, the abuse of power: the pervasive fallacy of power calculation for data analysis. The American Statistician 2001; 55; 19-24).

2. Of the 96 women who agreed to get investigated by BMD and participated in the current study, 6 women did not meet the study’s criteria and were excluded from the study. The basic clinical and demographic characteristics of the women were not significantly different from those who were included in the analysis. We have also added a sentence to the Methods section to clarify this fact (page 4). The following Table shows the characteristics of participants compared with excluded subjects:

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</tr>
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</table>
3. The “univariate analysis” was in fact the simple linear regression analysis, in which each risk factor was considered separately. This has been clarified in the text (page 6 paragraph 2 and page 7 last paragraph). We have now added a new table (Table 2) in the manuscript to show results of the univariate analysis.

4. The Reviewer is correct that the difference in BMD between smokers and nonsmokers was only observed in the obese group, not in the “overweight” or “normal” group. We have rewritten the sentence in page 8 to clarify this fact. We consider that the analysis of interaction between BMI and smoking status is more relevant than the analysis of interaction between weight and smoking status, because BMI is used for the diagnosis of obesity. While an analysis of smoking effect across weight ranges is interesting, we feel that such a categorization of weight is arbitrary whereas the categorization of BMI has clinical relevance. Our analysis has been adjusted for age and menopause status.

5. As stated in the Results section (page 8), there was no significant correlation between duration of smoking or cigarette dose and BMD. However, the duration of smoking and dose of cigarette in obese women were higher, albeit not statistically significant, than non-obese women. We have mentioned this fact in the Results section. We agree with the Reviewer, and have also modified the sentence “where the dose and duration of smoking was higher” to read “the effect of smoking was significant in obese women” (page 9).

**Minor Essential Revisions**

1. We consider that there is always a certain degree of interaction between risk factors, but whether the interaction is statistically significant is an issue of interest. In that regard, we consider that the word “no-interaction” is too deterministic for the real world situation. Therefore, we prefer the expression ‘a non-statistically significant interaction to “no-interaction”.

2. We have clarified the units of the regression coefficients in Table 3. The variables have included in the analysis are now listed.