Author's response to reviews

Title: A greater number of somatic pain sites is associated with poor mental health in adolescents: a cross-sectional study

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Author’s response to reviews: see over
On behalf of all of the authors, I would like to ask you to reconsider our manuscript now entitled “A greater number of somatic pain sites is associated with poor mental health in adolescents: a cross-sectional study” for publication in *BMC Psychiatry* as a Research Article. We greatly appreciate your and the reviewers’ helpful comments on the revised version of our manuscript. We have revised the manuscript again according to these suggestions and comments as follows.

MS: 1821470444731573
Title: Increased number of somatic pains is associated with poor mental health in 18,104 adolescents: a cross-sectional study

**Editor**

1. Comment: After reading through your manuscript, we feel that the quality of written English needs to be improved before the manuscript can be considered further. We advise you to seek the assistance of a fluent English speaking colleague, or to have a professional editing service correct your language. Please ensure that particular attention is paid to the abstract.

Thank you very much for your valuable advice. According to your suggestion, we had a professional editing service correct the English in our manuscript by Edanz, with particular attention to the Abstract.

**Reviewer Akira Babazono**
1. Comment: The authors responded that prevalence of somatic pain and proportion of those having poor mental health was comparable to other reports. However, there should be some limitation. You define somatic pain by a questionnaire rather than by a subjective examination. In addition, you define those having mental health by GHQ 12. Please describe information bias about your definitions of somatic pain and those having mental health.

As the reviewer pointed out, the information bias regarding the measurement of somatic pain and poor mental health should be mentioned. Therefore, we added the following sentence to the Discussion:

“Because we defined somatic pain and poor mental health by a self-report questionnaire rather than by an objective examination or interview, there might be reporting bias.”

2. Comment: You wrote as follows in page 20. “Inquiries about pain may also be beneficial in regard to suicide prevention because previous studies on depressive patients have demonstrated that individuals with somatic pain have a lower quality of life and higher suicidal ideation [32].” However, your study did not show any evidence on the point. The prevalence of somatic pain and proportion of those having poor mental health were very high in your study. It is not realistic for you to consider prevention strategy against suicide to them.

With this sentence, we intended to refer to the possibility of a selective strategy of suicide prevention using the questionnaire on somatic pain. However, because the present study did not show any evidence in support of this point, the sentence may introduce confusion. Therefore, we deleted the sentence from our manuscript.

Deleted sentence:
“Inquiries about pain may also be beneficial in regard to suicide prevention because previous studies on depressive patients have demonstrated that individuals with somatic pain have a lower quality of life and higher suicidal ideation [32].”

Reviewer Kazuhito Yokoyama
1. Comment: The manuscript seems still lengthy. The authors should make every effort to shorten the text.

According to the reviewer's comment, we have decreased the manuscript by more than 200 words.

2. Comment: Abstract section: Background should be more concise. Methods and Results should refer to the logistic regression analysis; Abstract must reflect the body of manuscript. Definition of “poor mental health” is necessary. “GHQ” should be “GHQ-12”.

Based on the reviewer's comments, we decreased the word count of the Background section and modified several sentences in the Abstract as follows:

*Modified sentence:*
“Although a few previous studies have suggested an association between the number of somatic pain sites and depression, they employed samples with a narrow age range.”

*Modified sentence:*
“Poor mental health was defined as ≥4 in the 12-item General Health Questionnaire, and perceived academic impairment was measured using a self-report questionnaire.”

*Added sentence:*
“Logistic regression analysis was utilized to examine the effect of somatic pain on poor mental health and perceived academic impairment.”

3. Comment: Methods section: Subheadings of “GHQ-12”, “Three sites of somatic pain”, “Perceived academic impairment”, and “Additional variables” should be under “Measures”. The sentence “The prevalence of each somatic pain… McNemar test” is unclear. Explanation of the logistic regression is insufficient; readers have to infer what the authors have done from the legends in Tables 2-4; “the outcome” should be “dependent variable” and “the exposure” should be “independent variable”.

Based on the advice from the reviewer, we deleted the subheadings “GHQ-12,” “Three sites of somatic pain,” “Perceived academic impairment,” and “Additional variables.”
We modified several sentences regarding the statistical explanation in the Methods section according to the reviewer’s comment. We also changed the terms “outcome” and “exposure” to “dependent variable” and “independent variable.”

**Modified sentence:**
“The prevalences of two different sites of somatic pain were compared using the McNemar test.”

**Modified sentence:**
“A similar multivariable analysis using logistic regression modeling was conducted in which each pain site was treated as the independent variable.”

4. Comment: Results section- The results of statistical inference should be in Table 1, not in the text.

Based on the reviewer’s comment, we added statistical inference results to Table 1 and deleted the description from the text.

**Deleted sentences:**
“For all three somatic pains, the prevalence was higher in females than in males (p < 0.01). One-month prevalences of headache and abdominal pain were higher than that of neck and shoulder pain (p < 0.01). Regarding differences among school grades, the prevalence of neck and shoulder pain was higher in high school students than in junior high school students (p < 0.01).”

**Deleted sentences:**
“Mean total score for the GHQ-12 was significantly higher in females than in males (p < 0.01). Moreover, the mean total score for the GHQ-12 was higher in high school students than in junior high students (p < 0.01).”

5. Comment: Discussion and whole text: In my comments to the first manuscript, I pointed out that subjects with increased number of complaints or subjective symptoms, i.e. high GHQ scores, probably reported somatic pains more, and such person might
report low perceived academic achievements. The authors should consider a problem of “trait” or “personality” of subjects.

According to the reviewer’s comment, we added a brief discussion regarding residual confounders to the Discussion section as follows:

*Added sentences:*
“There may also be residual confounders such as personality. The observed associations among high GHQ scores, somatic pain, and perceived academic impairment might reflect the personalities of the students who tend to voice many complaints."

I hope that these revisions have sufficiently addressed the reviewers’ comments. Thank you very much for your kind consideration of our manuscript.

Respectfully yours,

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