Author's response to reviews

Title: Age at Menarche in relation to Nutritional Status and Critical Life Events among girls in Urban and Rural Secondary Schools in Post Conflict Northern Uganda

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Author's response to reviews: see over
Thank you for your helpful comments. The changes made are indicated after each paragraph under each reviewer.

**Reviewer 1: dharampal dambhare**

Discretionary Revisions: Selection Bias should have been avoided

AU: Statement given (Lines 195-198).

**Reviewer 2: Desalegn Zegeye**

**Major compulsory results**

Comment: The result section is too short. No description of the socio-demographic Characteristics and the outcome variable provided.

AU: Updates done Table 1a created for demographic characteristics with texts included in the manuscript (Lines 154-166).

Comment: In the discussion section, age at menarche and determinants should be discuss in detail.

AU: Discussion done. See discussion section.

**Minor essential revisions**

Comment: In the objective section of the Abstract, stress was considered as an independent variable but never mentioned in the result section.

AU: Various stressful life events defined and included in the results section, etc. See table 1a and texts (Lines 154-166).

Comment: The type of statistical test used to compare the age at menarche should also be stated in the methods section.

AU: Test statistics added to the texts ((Lines 154-167, 171, 173, 178, and 179-180).

**BMC Reviewers:**

This manuscript reports results on the association between stressful life events, nutritional status, and age at menarche in an area of post-conflict Northern Uganda. The data were collected from a cross-sectional survey with 271 urban and rural women attending secondary schools. The results and research question are interesting; however, the manuscript would be strengthened if the
authors addressed several key issues. Most importantly, the results section is too brief and no descriptive information is presented on the socio-demographic characteristics of the sample or the predictors that were studied. Additionally, the description of the measures in the methods section is insufficiently detailed, in particular, the description of the measures of stressful life events, and more information on the statistical methods needs to be provided. Finally, additional details should be provided on the study limitations. In addition to addressing the comments of the two reviewers, the authors should address several additional points, outlined below.

AU: We elaborated the results and added descriptive information on the socio-demographic characteristics of the sample and the predictors that were studied (page 7, results). Description of the measures of stressful life events (page 5 last para and page 6), and more information on the statistical methods are added (page 6, Statistics)

**Major Compulsory Revisions**

**Abstract**
1. The last sentence of the method section of the abstract does not mention childhood stress. This should be added to the list of predictors that were analyzed.

AU: Rephrasing done (Line 36).

2. The findings on the relationship between the stress measures and age at menarche should be added to the results.

AU: Added to both the abstract and results sections (page 2, lines 45-45, 158-160)

**Introduction**

1. Please explain whether the hardships experienced in the Gulu District were different for those in rural versus urban areas during the conflict period.

AU: Sentence inserted (page 4, Lines 82-84).

**Methods**

1. Please describe the measures of stressful life events in greater detail. How and why were these particular measures selected? How were responses coded? Have these measures been used previously in other studies? Did the measures ask if these events had ever been experienced, or experienced within a certain time frame? It would be helpful to include some of the question wording. It is unclear, for example, what types of questions were asked. Table 1 indicates that the authors measured both ?presence of sister? and ?presence of elder sister.? What is the difference between these measures and what exactly did they assess?

AU: The description of critical life events was done (Lines 112-121). Why and how the measures were taken added (Lines 121-124). How the responses were coded was done (Lines 124-126). To the best of our knowledge, these measures were not used before in other studies.
This information has not been included in the study questionnaire. Points on how questions were asked clarified in text (Lines 112-131). The difference in measures explained (Lines 127-131).

2. How was the measure of stressful life events analyzed in relationship to age at menarche? The authors need to mention the statistical test used to determine whether stressful life events were associated with age at menarche, e.g. t-tests, ANOVA? Also, the authors should mention that each stressful life event was analyzed independently.

AU: Details on analysis and statistical tests inserted (Lines 133-142).

3. The authors conducted additional analyses to determine if nutritional status and stressful life events differed for rural versus urban girls. This needs to be mentioned in the methods section and the statistical methods used for this analysis described.

AU: This was done (Lines 142-143)

**Results**

1. Information on the characteristics of the study participants should be reported in the text, and Table 1 should be updated to include percentages, as well as n's.

AU: Updates done Table 1a created for demographic characteristics with texts included in the manuscript (Lines 154-166).

2. The authors should report descriptive findings on stressful life events in the text. Which events were most commonly reported? Were there any differences in the types of stressful events or the frequency of stressful life events reported by rural versus urban girls?

AU: Descriptions of stressful life events added in Table 1a, and texts (Lines 163-167).

3. The authors should separate the descriptive results from bivariate results in Table 1. It would be preferable to include a separate table showing bivariate results and including a separate section describing these results in the text.

AU: Done. See Table 1a. and texts (Lines 154-166).

4. When describing statistically significant differences, the test statistic should be reported in addition to the p-value (e.g. T-test, F-test, r).

AU: Test statistics added to the texts ((Lines 154-167, 171, 173, 178, and 179-180).

**Discussion**

1. The authors mention the possibility for a bias in the sample because the sample included only girls attending secondary schools. Are there any data available on the percentage of girls who attend secondary school in this region that could be included in the text? How exactly might this selection issue affect the results? This needs to be stated.
AU: Statement given (Lines 195-198).

2. There is some repetition of text in the discussion. Please correct this.

AU: Deleted and rearranged the texts (Lines 250-268, and 209-221).

3. The authors need to include a section on study limitations. In this section, there needs to be a discussion of the limitations of the measures of stressful life events, for example, it is possible that participants were unwilling to report on these events, or that the most relevant types of events were not measured. It also may be that the perceived stressfulness of the events is what matters and not just that an event occurred. These points, and other caveats about the measures need to be discussed.

AU: A section included on study limitations and explanations (Lines 272-277).

4. The authors should put their results in the context of Uganda broadly. What is the age at menarche nationally and for urban/rural women? Is Gulu different from other parts of the country? If so, in what ways?

AU: Done (Lines 269-271).

5. The findings on stressful life events should be put in the context of other research on stress, social conditions and age at menarche. How are these findings similar or different to what other scholars have found when studying these issues and what might account for the differences?

AU: See texts under discussion. Many of the factors however were not studied.

6. What areas for future research would the authors recommend based on these findings?

AU: Done see lines 275-276

Conclusion
1. In the conclusion, the authors report that rural girls have a later age at menarche than urban girls but this was not statistically significant. This statement conflicts with the information reported in Table 1 which shows a significant difference by site. Please correct.


2. The conclusion that girls showed?resilience to critical life events in childhood? is overstated, given the limitations of the measures and the sample, and the fact that only one outcome was studied: age at menarche. The authors should conclude on a more cautious note. Stressful events may very well be connected with other negative outcomes and it is possible that the findings reflect the types of measures included and who was included in the sample.
Discretionary Reviewers

1. The authors might consider creating a scale of stressful life events and analyzing whether this measure is associated with age at menarche. This type of analysis would provide additional data on whether the experience of cumulative stressors is associated with age at menarche. Reporting descriptive results on the cumulative number of stressors reported would also shed light on whether stressful events were typically experienced together versus independently.

2. The results would be more compelling if a multivariate regression analysis were conducted, rather than just bivariate analysis. This would help to rule out confounding.