Author's response to reviews

Title: Prevalence and severity of anemia among school children in Jimma Town, Southwest Ethiopia

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Author's response to reviews: see over
Title of the manuscript: Prevalence and severity of anemia among school children in Jimma Town, Southwest Ethiopia
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Reviewer 1 (Zohreh Rahimi):- The standard diagnostic means of anemia is measurement of hemoglobin level. To investigate further about the cause of anemia, is it due to iron deficiency or vitamin B_{12} and folic acid deficiency, serum ferretin level can be measured. However, reagents for the detection of serum ferretin were not available that time. Hemoglobin measurement is adequate to determine the prevalence and severity of anemia in general. We reported in the present study magnitude of general anemia among school age children in the study site but not specific to iron deficiency anemia. The present research report does not aim at reporting hereditary related hemoglobin disorders. Iron deficiency anemia and hemoglobinopathy will be reported by another research team.

Reviewer 2: (Amol r Dongr): Editorial and grammatical errors of the manuscript were corrected.

Additional comments:-

Abstract

- Age group of the children (6-14 years) who are participated in the study was included in the abstract as per the comment. It is highlighted red in the methods section of the abstract.
- Ethical permission was obtained from the Ethical Board of Jimma University, consent was taken from the children’s parents or guardians and confidentiality was kept. These ethical issues were added to the document in the methods section of the abstract and highlighted red.

Introduction:

- As per the comment given, make up was made in the introduction section as “Lack of awareness among the mothers about the problem besides their low educational status, poor nutritional practices and unhealthy food habits.” It is highlighted as red.
- The long term effect of anemia on female children was added to the rationale of the present study at the end of the introduction section.
- 500 ETB means 500 Ethiopian Birr, which is equivalent to 27 USA Dollars according to the current exchange rate.
**Study design and sample size calculation**

- No software was used to calculate the sample size. It was calculated manually. The sample size was calculated using the formula as follow:

\[
\begin{align*}
n &= \frac{(Z_{\alpha/2})^2 \times p(1-p) + 10\%\ of\ n}{e^2} \\
n &= \frac{(Z_{\alpha/2})^2 \times p(1-p)}{e^2} \\
n &= \frac{(1.96)^2 \times (0.5) \times (0.5)}{0.05^2} = 384.16 
\end{align*}
\]

When adding 10% for the non-response rate: \(384 + (384 \times 10\%/100\%) = 423\)

- The sample size of 423 was determined using single population proportion formula as shown above. The prevalence \(p\) of anemia 50% was taken at 95% confidence interval and 5% margin of error \(\varepsilon\) was taken. Ten percent non-response rate was added to the sample size as a contingency.

**Sampling Technique**

- The population of Jimma town per gender was included in the manuscript in the first paragraph of the methods section. The total number of school age children was also included and highlighted red. Reference was cited in the text as well as in the reference list and the sequence of the reference was adjusted.
- The sampling method used was definitely systematic random sampling. It is corrected.
- What method was used to select if there were more than one child aged 6-14 years in the selected households? One child was selected by a lottery method.

**Result**

**Sociodemographic characteristics**

- One sentence describing the parent’s occupation of the children was added in the results section. Occupation of parents (fathers and mothers) has shown a significant association in case of Chi-square test, which is the weak measurement of statistical associations. But, when those predictor variables that have shown significant association with anemia were tested by multivariate logistic regression analysis, parental occupation has no significant association with anemia as shown in table 4.
Prevalence of anemia

- The age category of children in the present study as 6-11 and 12-14 was adopted from related literatures and WHO’s guidelines as indicated in Reference numbers 31 and 32 in the manuscript.
- Significant difference of the mean hemoglobin level between children in the age group of 6-11 and 12-14 years was newly included in the manuscript.

Severity of anemia

- In order to calculate the severity of anemia, the denominator 152, which is the total number of anemic children, was taken. Correction was made by taking the denominator 404. Therefore, the proportion of children with mild anemia was 18% and with moderate anemia was 19.6%.
- The pie chart was corrected. The space was removed and total was adjusted to make it 100%.

Discussion

- Yes, as pointed out, the main finding of the present study was low monthly income of the parents and the poor economic capacity to purchase and consume animal and plant food were predictors of anemia and contribute to the high prevalence of anemia in the present study.
- Are there any national level programs going on prevention of anemia? There is no such a program at national level to provide micronutrients such as iron and vitamin supplementation. However, physicians prescribe iron tablets, vitamin B\textsubscript{12}, folic acid to anemic children detected in health institutions.
- How can the findings of present study help policy or program development? After the manuscript is published, policy draft will be developed and submitted to the policy makers at the federal level.

Conclusion

- Did the study include any service component for the children diagnosed with anemia? Iron tablet was distributed to anemic children.
Tables

• The reasons for missing values were information was not given about educational status and occupation of parents of the children in the study. Missing values were included in table I and highlighted red.
• Figure 4 was corrected.

Reviewer 3: (Marly A Cardoso)

Abstract

• The prevalence of anemia in the two age category was given in the abstract section of the manuscript as per the comment.

Methods

• All the necessary safety measures taken during blood collection were included methods section of the manuscript.
• The study variables were grouped as dependent variables that are outcome variables, which is anemia. Independent variables are variables that predict anemia.
• Anthropometric measurement: description was incorporated in the methods section with references. It is highlighted red.
• On page 4, “non-anemic group” described as a control group was corrected as per the comment.

Data analysis

• Why multiple logistic regression models in a cross-sectional study? The prevalence ratio was taken.
• The reason why multiple logistic regression model was applied was to identify those independent variable that predict anemia the outcome variable.
• Please provide information on criteria and framework used for selection and analysis of independent variables in multiple models. Those independent variables that have shown significant association to anemia in the Chi-square test as well as binary regression analysis were taken and tested by multiple regression analysis to identify the powerful predictor variables and to reduce confounder variables.
Discussion

- Limitation of the study was newly included in the manuscript.
- An update literature review has been done

Conclusion

- The term “risk factors” was replaced by causes in the manuscript.
- The recommendation of micronutrient supplementation was removed

Reviewer 4: (Emily Rousham)

Abstract

- “Household survey” was included in the abstract and highlighted red.
- 'Sociodemographic and anthropometric data' were included in the methods section of the abstract and highlighted red.

Methods

- The anthropometric techniques were described in the methods section.
- The word 'magnitude' was removed from the abstract (line 1), and replaced with 'Prevalence' as per the comment and highlighted red.
- The sample size calculation was described more precisely above on page 2 of the point-by-point comment accommodation. It was asked by Reviewer 2: (Amol r Dongr).
- Who answered the questions? The questionnaire was administered to the parents or the guardian of the children by the interviewers.
- Under 'operational definitions' numbering/subheadings for severe, moderate and mild anemia were remove and written as full text as per the comment and highlighted red.
- Ethical considerations: Jimma University has institutional ethical board that approves the ethical clearance of researches done on human samples.

Results

- The subheading Sociodemographic characteristics is changed to Sociodemographic and anthropometric characteristics in the result section of the manuscript. Description of the anthropometric results was given and highlighted red.
**Discussion**

- To comment on the presence of absence of intestinal parasitic infection as a cause of anemia, stool sample was not collected to be honest. This part was included in the discussion and highlighted red.
- Naming of authors on the reference citation the discussion was corrected and highlighted red.
- Figure 1 that describes severity of anemia was removed.
- Table 3: typographic error of 430.2 was corrected as 30.2
- Additional review of the relationship between consumption of plant foods and meat and anemia was included.

End