Author’s response to reviews

Title: Prevalence and Determinants of Stunting in a Conflict-Ridden Border Region in Armenia - A Cross-Sectional Study

Authors:

Arin Balalian (aa3794@cumc.columbia.edu)
Hambardzum Simonyan (hsimonyan@far.am)
Kim Hekimian (kh2551@cumc.columbia.edu)
Richard Deckelbaum (rjd20@columbia.edu)
Aelita Sargsyan (AelitaSargsyan@far.am)

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Author’s response to reviews:

Dear Dr. Koski,

Thank you very much for the careful consideration and thorough review of our paper. On behalf of my co-authors, I am pleased to re-submit the revised paper entitled “Prevalence and Determinants of Stunting in a Conflict-Ridden Border Region in Armenia - A Cross-Sectional Study” for further review and inclusion in BMC Nutrition Journal. Our point-by-point response to the Editors’ and reviewers’ comments is provided below:

Rachel Krause, Ph.D. (Reviewer 1)

R1-1
Since the study did not gather any particular data related to conflict such as disruption to household food security we decided to minimize this aspect of the study. We will take the suggestion to gather more information regarding conflict into account, for the future studies (page 5, lines 4-9).

R1-2

We presented the most frequently parasites encountered in the text and in table 1 as suggested. We also did not find a significant association between STH types and stunting in univariable logistic regression or chi-square test of independence. We will consider including infants older than 6 months old for future studies (Table 1 and page 11 line17).

R1-3
The Kato katz method is now considered not a very well method for analysis of hookworm parasite, since the hookworm eggs collapse within 30-60 minutes of preparation of the sample. It is possible that is the reason for encountering only one hookworm infection within the study sample.

R1-4

We described the methods of stool sample collection in detail as suggested (page 7, lines 20-23).

R1-5

We corrected the description of the marginally significant association found between prolonged diarrhea and stunting, described in the text (page 14, lines 20-27).

R1-6

We updated table 3 and created a Demographic and baseline characteristics of study participants overall and by age group table (table 1). The actual values and the mean values for the main predictor variables were included in the table. p values for the differences between child age groups for continuous variables were obtained using an analysis of variance F-test. P values for different proportions between child age groups for categorical/binary variables were obtained by Chi-squared test. (Table1, table2, Table3)

R1-7

We completely changed our Table-1 and Table 2. we provided a description and summary of the data provided in Table 2 to explain the differences in measures of association in different age-groups of children stratified by the place of residence. We tested whether place of residence modifies the association of stunting, anemia, STH, Minimum Dietary Diversity and low birthweight with the age-group, using Breslow-Day test and concluded that there was no evidence for effect modification. (Table1, table2)

R1-8

We share the concerns raised by the reviewer about the appropriateness of the question related to diarrhea. In fact the questionnaire was adapted from Armenian Demographic and Health survey with minor changes. We do not believe that the question regarding diarrhea is fully reflecting the true history of diarrhea and it is subject to recall issues. However, since this recall is irrespective of our main outcome (stunting) it will likely be non-differential, deviating the measure of association towards the null. Moreover, given the context of the setting in the study area, we believe that the hospital admission rate for diseases such as diarrhea in the region is poor. Instead the population relied on home remedies for treatment of conditions such as diarrhea (This issue was addressed in the educational component that followed this study). Thus, excluding the possibility of medical record review in the primary and secondary health care settings to verify the history of episodes of diarrhea. We therefore thought that asking this question will provide an
estimate of rates of diarrhea. We provided a discussion for the limitation regarding the diarrhea question in the limitations section (page 14, lines 20-27).

R1-9

On another attempt to re-analyze the effect of socioeconomic status on stunting We used a standardized socio-economic score as a composite of based on mothers’ answer to three questions: (a)mothers’ education; (b)Family income compared to their neighboring households; (c)whether the child has ever slept hungry because of food unavailability. We tested the effect of standardized ses score as well as three variables separately in univariable logistic regression model. However, there were no significant association between stunting and the predictors in our univariable models. Based on importance of these predictors we also included them in our multivariable logistic regression model for the children 6-24 months old and our hierarchical model for the children 25-72 months old. However, none of the SES variables improved the models fit(Table 3, Table 4, Table 5) (page 10).

R1-10

We expanded on the effect of gender ass suggested (page 14, lines 7-13).

R1-11

We provided the summary of important characteristics of the mothers and children in the new Table 1 including mean mother’s height and standard deviation as suggested. Stunting is an indicator for child malnutrition. We did not have any information on adult malnutrition including maternal blood micronutrient concentration and BMI (Table 1).

R1-12

We do not have an information on maternal growth trajectories. Therefore, we could not provide this information in our study. We did not find any evidence in the literature for an appropriate cut-off values for adult stunting. The appropriate indicators to assess adulthood malnutrition were BMI and micronutrients concentration.

R1-13

The breastfeeding duration variable, measured the total duration of breastfeeding. It did not refer to current or past breastfeeding status. We changed the phrasing of the sentence to make the variable understandable for the reader (page 15-lines 1-5).

R1-14

We changed the phrasing of the sentences and paragraphs mentioned to make the article more understandable for the reader.
Dianjianyi Sun (Reviewer 2):

R 2-1

The comments regarding the tables were all addressed. We refined and changed the tables to make them easier to understand for the reader. We provided borders for the tables.

R2-2

Since the topic of this paper was to explore the predictors and prevalence of stunting, we refrained from exploring the determinants of anemia and low-birthweight and birthlength. We will cover those topics in our future articles and separate manuscripts.

R2-3

We changed the title of the table 2 to “Demographic and baseline characteristics of study participants overall and by age group stratified by place of residence”. However, since low-birthweight and minimum dietary diversity are important birth outcome and children’s nutrition indicator, therefore, we kept these variables in the table.

R2-4

We changed the phrasing of the sentences in the discussion section to explain impaired complementary feeding and significant associations for the reader. (page 15, line 2)

Editor Comments

E1-1:

We minimized the aspect regarding to conflict in the study. We created a variable based on the geographical distance from the border and front lines of the conflict zone. The two villages closest to the front line were considered positive for being exposed to violence. The association between this variable and stunting was examined in univariable logistic regression model, however, we did not find a significant association. We did not have any information about household food security at the time of conflict (page 5, lines 4-9).

Abstract: We changed the abstract to reflect the statistical methods used for our study as well as the variables used in our models. We also explained the reason behind not stratifying the results by the place of residence. We did not include the variables that are not used in our final model in the abstract.

Introduction: We expanded the background information particularly regarding the risk factors of stunting. We also included a paragraph explaining the specific aims of the study at the end of background section.
Material and Methods: We described the missing information regarding the variables listed in Table 1 and Table 4. The information regarding the manner of the collection of the data and who collected the data were described in data collection and study variables section in detail. Specifically we mentioned (page 8 lines 15-19) that: “In the interview with the caregivers of children, the caregivers were asked about child’s birth weight & birth length; child’s age, any breastfeeding; exclusive breastfeeding; breastfeeding duration; residence; mother’s height; mother’s participation in community training about child nutrition; accessibility of printed materials about child nutrition; any history of prolonged diarrhea or STH reported by the caregiver; and a detailed diet of the child over the last 24 hours.”

We included the details of the stool sample collection (page 7, lines 20-23).

We considered using the multilevel logistic regression model for both of the age groups. The estimated G matrix was not positive definite for the unconditional model estimating predictors of stunting among children 6-24-month old. We therefore, used the multivariable logistic regression model to estimate the predictors of stunting among children in this age group. We used the multilevel logistic regression to estimate the predictors of stunting among 25-72-month old children. We did not find any evidence that residence in urban or rural settings modified the association between age group and stunting. Therefore we refrained from stratifying our analysis by the place of residence. Moreover, conducting separate analysis by place of residence would decrease the sample size and power. BMI was also included as a significant predictor of stunting to our models for both the age-groups.

Results and Discussion: We have changed and refined the results and discussion section completely based on the new statistical approach, results as well as their interpretation. We incorporated the suggestions made by reviewers and editor in the discussion section. Specifically, we updated the discussion based on the findings from employing hierarchical models. We expanded on the role of gender in development of stunting. We expanded on the limitations of the variables used to calculate socio-economic score. We tested for interactions, however none of the interactions were significantly associated with the outcome, therefore, we refrained from including them in our final models.(Page9-15)

We would like to thank you again for your consideration and we are looking forward to hearing from you.

Best,

Arin A. Balalian