

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Early life risk factors of motor, cognitive, and language development: a pooled analysis of studies from low-and middle-income countries
<b>AUTHORS</b>	Sania, Ayesha; Sudfeld, CR; Danaei, Goodarz; Fink, Günther; McCoy, D; Zhu, Zhaozhong; Fawzi, Mary C; Akman, Mehmet; Arifeen, Shams E.; Barros, Aluisio; Bellinger, David; Black, Maureen; Bogale, Alemtsehay; Braun, Joseph M; van den Broek, Nynke; Carrara, Verena; Duazo, Paulita; Duggan, Christopher; Fernald, Lia; Gladstone, Melissa; Hamadani, Jena; Handal, Alexis; Harlow, Siobán; Hidrobo, Melissa; Kuzawa, Chris; Kvestad, Ingrid; Locks, Lindsey; Manji, Karim; Masanja, Honorati; Matijasevich, Alicia; McDonald, Christine; McGready, Rose; Rizvi, Arjumand; Santos, Darci; Santos, Leticia; Save, Dilsad; Shapiro, Roger; Stoecker, Barbara; Strand, Tor A.; Taneja, Sunita; Tellez-Rojo, Martha-Maria; Tofail, Fahmida; Yousafzai, Aisha; Ezzati, Majid; Fawzi, Wafaie.

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Kinga Polanska Nofer Institute of Occupational Medicine Department of Environmental epidemiology
<b>REVIEW RETURNED</b>	24-Sep-2018

<b>GENERAL COMMENTS</b>	<p>Why data from grey literature was also included in the meta-analysis?</p> <p>In line 15-17 on page 11 maternal and paternal educational level can be combined in one like: father's and mother's education (none&lt;1 year....)</p> <p>The authors have not included smoking which is frequently pointed as significant risk factor for child neurodevelopment</p> <p>The description of outcome variables should be included under methods section not under results – I would include under methods separate subheadings: exposure variables, outcome variables and confounders. From the current description it is not clear which variables were considered as exposure which as covariates (like educational level).</p> <p>Different tests were used in different studies for child neurodevelopment – were they standardized for meta-analysis (how the results from one test for psychomotor assessment is comparable with other?) – it need to be clearly described</p> <p>Regarding parental educational level – aren't they correlated (maternal and paternal educational level)?</p>
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<b>REVIEWER</b>	Ricardo Sabates University of Cambridge, UK
<b>REVIEW RETURNED</b>	05-Nov-2018

<b>GENERAL COMMENTS</b>	This is a sound study which combines data from LMIC on early risk factors affecting later development (language, motor and cognitive). While the use of meta analyses is important as it brings together evidence from many different sources, it is not clear what are the theoretical factors underlying the research and whether these theoretical factors can capture contextual variations. In other words, the role of maternal education seems to be the same in rural Ghana than in urban India and potentially there are important contextual differences which a meta-analysis ignore. If these can be identified by the authors, by providing both the theoretical framework (short inclusion) and reflections on whether/how the data reflects such framework, will greatly improve the paper.
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<b>REVIEWER</b>	Ersin Ogus Baskent University, Turkey
<b>REVIEW RETURNED</b>	25-Feb-2019

<b>GENERAL COMMENTS</b>	The title of the manuscript is "Early life risk factors of motor, cognitive, and language development: a pooled analysis of studies from low-and middle-income countries ", but, " Eligibility criteria for selecting studies: Studies that assessed at least one domain of child development in at least 100 children under 7 years of age, and collected at least one early life factor of interest were included in the study. ", you should emphasize this in the title of the manuscript.
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### VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Kinga Polanska

Institution and Country: Nofer Institute of Occupational Medicine Department of Environmental epidemiology

Please state any competing interests or state 'None declared': none declared

Please leave your comments for the authors below.

Comment 1: Why data from grey literature was also included in the meta-analysis?

Response: We included grey literature to include a more comprehensive representation of studies. The Cochrane collaboration notes "failure to identify trials reported in conference proceedings and other grey literature might affect the results of a systematic review." As a result, by including grey literature we also reduced the risk of missing studies or only selecting those that published results.

Comment 2: In line 15-17 on page 11 maternal and paternal educational level can be combined in one like: father's and mother's education (none<1 year....)

Response: We have combined the variable categories (page 10, paragraph 1)

Comment 3: The authors have not included smoking which is frequently pointed as significant risk factor for child neurodevelopment.

Responses: We agree with the reviewer that smoking is a major risk factor for children's neuro development. However, none of the data sets included in the analyses had data on prenatal smoking. A future metanalysis could address this very important question on the effects of prenatal smoking on

child development in LMIC.

Comment 4: The description of outcome variables should be included under methods section not under results – I would include under methods separate subheadings: exposure variables, outcome variables and confounders. From the current description it is not clear which variables were considered as exposure which as covariates (like educational level).

Response: We have added sub heading on exposure and outcome variables in the method section. We included the description of the outcome assessments in the result section as we obtained these information after we gathered the datasets.

Comment 5: Different tests were used in different studies for child neurodevelopment – were they standardized for meta-analysis (how the results from one test for psychomotor assessment is comparable with other?) – it need to be clearly described.

Response: We added comments on standardization of outcome scores on Page 11 under subheading outcomes, and subheading metanalyses.

Comment 6: Regarding parental educational level – aren't they correlated (maternal and paternal educational level)?

Response: Yes, parental education is highly correlated. The estimates presented for father's education is adjusted for maternal education.

Reviewer: 2

Reviewer Name: Ricardo Sabates

Institution and Country: University of Cambridge, UK

Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

Comment 1: This is a sound study which combines data from LMIC on early risk factors affecting later development (language, motor and cognitive). While the use of meta analyses is important as it brings together evidence from many different sources, it is not clear what are the theoretical factors underlying the research and whether these theoretical factors can capture contextual variations. In other words, the role of maternal education seems to be the same in rural Ghana than in urban India and potentially there are important contextual differences which a meta-analyses ignore. If these can be identified by the authors, by providing both the theoretical framework (short inclusion) and reflections on whether/how the data reflects such framework, will greatly improve the paper.

Response: We have included a reference to the nurturing care framework for early childhood development proposed by the WHO in the methods section under the subheading risk factors. We agree that there was large heterogeneity in some of the meta-analysis which may represent the contextual variation that need to be taken into consideration in the design and evaluation of interventions. We have included a comment on this issue in the discussion section (page 20, paragraph 1)

Reviewer: 3

Reviewer Name: Ersin Ogus

Institution and Country: Baskent University, Turkey

Please state any competing interests or state 'None declared': The authors have no conflicts of interest relevant to this article to disclose

Please leave your comments for the authors below

Comment 1: The title of the manuscript is "Early life risk factors of motor, cognitive, and language development: a pooled analysis of studies from low-and middle-income countries ", but, " Eligibility criteria for selecting studies: Studies that assessed at least one domain of child development in at least 100 children under 7 years of age, and collected at least one early life factor of interest were included in the study. ", you should emphasize this in the title of the manuscript.

Response: We have included this information the abstract section as we need to keep the title within a specific length.

#### **VERSION 2 – REVIEW**

<b>REVIEWER</b>	Ricardo Sabates University of Cambridge
<b>REVIEW RETURNED</b>	24-Jun-2019

<b>GENERAL COMMENTS</b>	The authors have undertaken the revisions that I recommended in a satisfactory manner.
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