Reviewer’s report

Title: Effects of the Home-based Educational Intervention on Health Outcomes among Primarily Hispanic Children with Asthma: A Quasi-Experimental Study

Version: 0 Date: 11 Mar 2019

Reviewer: Leslie Allsopp

Reviewer's report:

Summary Comments:

The work has numerous strengths and may make an important contribution to the health of a vulnerable population of children and families. At the same time, there are numerous points to consider for revision. Individually, most of the recommended revisions are minor; taken as a whole they represent an opportunity to substantially strengthen the manuscript and the impact of the work. I also recommend careful editing throughout to correct numerous errors in grammar and sentence structure. One example is the frequent use of "Health Homes" rather than "Healthy Homes". Other examples are highlighted throughout the annotated PDF.

Background:

The authors have generally done a good job of synthesizing the literature. However, I noted an error in presentation of one study I am familiar with. On line 35 it states "Moreover, the total cost of asthma for the pooled sample of about 214,000 was about $82 billion in 2013." In fact this is an estimate for the entire US based on the pooled sample. I am not sure if this is an error in writing or author interpretation, but it would strengthen the manuscript to correct this and assure there are not similar instances.

Methodology:

Important strengths of the study include the Difference in Differences design, the use of a validated tool for the pre and post-test survey, and a standardized curriculum. These strengths support the study's important potential contribution to the health and well-being of vulnerable children and families.
Blinded, school level, randomization was done to create intervention and control groups and demographic characteristics of each group are measured and controlled for. This approach has strengths. At the same time, within a single ISD there may be substantial school level variation in factors that are not reported. Specifically, school attendance zones may vary with respect to neighborhood level factors that are relevant to study outcomes. Examples include transportation, age and quality of housing stock, accessibility of health services, and ambient air quality. These factors could potentially mediate outcomes and response to the intervention, especially given the statistically significant higher income among intervention families. While such neighborhood level factors may or may not be important in this specific study location, acknowledging this possibility would support interpretation of findings and suggest future investigations.

The intervention being assessed is the "60-90 minutes of direct education;" further characterization of the intervention would be extremely helpful. What was the content and how was the "direct education" delivered by CHW? What was the training and experience of these CHW and was there training specific to this intervention? Given the authors make recommendations regarding training of CHWs in the conclusions, this is especially important information. Additionally, is there any information regarding fidelity in delivering the intervention? This type of information is necessary for interpretation of the results, dissemination and implementation, potential scaling, and recommendations to policy makers that are included in the conclusion. If the information is available it should be included. If it is not, it should be a recommendation for future study.

Although studies referencing the curriculum used are referenced, I do not see a reference for the curriculum itself. This would be helpful.

A dichotomous, family reported measure of income < 15,000 is used for participants that does not incorporate number of household members. Incorporation of household number and income are usually used in measures of poverty; the absence of household number is considered a limitation in measuring this important variable.

Results:

It is important to understand what proportion of families invited to participate in the study consented to do so; the proportion completed the study is important as well. These questions are important to identify potential selection bias and determine validity of findings.
Asthma prevalence based on the number of students identified as having asthma would be helpful. As school studies commonly find there is under-identification of students with asthma, they generally present how students are identified as having asthma. Additionally, it may be important to consider how expected and observed asthma prevalence compare in schools randomized to control vs. schools randomized to intervention.

The authors state, "the control and intervention groups were not statistically different except for household income (p=0.027), indicating that the two groups were comparable." While the point estimate of income difference is not large, income is of substantial potential importance to study outcomes. As a result, I do not see the statement of comparable groups is adequately supported and warrants some caution in interpretation. For example, a higher income family may have greater capacity to implement Healthy Homes recommendations, higher income may be associated with higher education or other family level characteristics which might also be relevant to outcomes. Another factor to consider is the limitation in self-reported income noted in methodology comments. Acknowledging the income difference between the intervention and control group and considering its potential importance in this instance would strengthen interpretation of results.

Lines 33 -51 report results using Acronyms of outcomes that are not defined. I only identify EC and EF being defined in the abstract. This is necessary to address. Given the conclusions stated about emotional well-being of families, it would be important to have more information about the EF and other scores. It may also be of interest to consider why the intervention was associated with improvement in EF but not EC.

Discussion and Conclusions:

While the conclusions are in-line with the evidence provided, I recommend greater acknowledgement of limitations including those identified in this review and more cautious interpretation of the results and conclusions. This is the reasoning behind the "No" response to the question regarding adequate support for conclusions.

Specific contributors to this response include the limited information provided regarding the nature of the "direct education" intervention, CHW training, and the CHSA scores, especially as the authors conclude that "the study emphasizes the importance of caring for children and their families emotionally in training of health care professionals like CHWs" (page 15, lines 49-54).
Also important is information regarding the proportion of students/families with identified asthma that consented to participate, and the proportion that completed the study.

Relatively minor changes in the wording would bring the conclusions in better alignment with the strength of evidential support. The study makes important contributions and identifies areas where additional research is needed so that modifiable risks for vulnerable children can be effectively addressed. At the same time greater caution is warranted regarding recommendations for policy makers and dissemination and implementation of this program. This is necessary to assure that benefits suggested by this study are provided if the intervention is expanded, and to understand if and how the interventions may support sustainable improvement in health and well-being of this important group of children and families.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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