PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Integrating community health volunteers into non-communicable disease management among Syrian refugees in Jordan: a causal loop analysis.
AUTHORS	Parmar, Parveen; Rawashdah, Fatma; Al-Ali, Nahla; Abu Al Rub, Raeda; Fawad, Muhammad; Al Amire, Khaldoun; Al-Maaitah, Rowaida; Ratnayake, Ruwan

VERSION 1 – REVIEW

REVIEWER	Karin Diaconu Institute for Global Health and Development, Queen Margaret University, Edinburgh
REVIEW RETURNED	13-Dec-2020

GENERAL COMMENTS	This article was a pleasure to review and I commend the authors for focusing on a relatively neglected topic and for their dedication to identifying pragmatic solution to a pressing health concern among displaced populations. Most of the comments provided are minor, however the major challenge here relates to analysis and presentation of results, which if strengthened would make this an exceptional paper. Major comments: This paper points to some critical insights for why NCD care delivery to displaced populations may benefit from community interventions (notably CHVs); there is a lot of valuable data here, however, both analysis and presentation of findings require review and refinement. The main issue seems to be how to move between descriptive vs. analytic findings- at the minute, the text reads like it wants to do a bit of both but too quickly and often just scratching the surface, relying too much on the reader filling in information. The authors are using the CLD both to describe the problem at hand (how is it that effective NCD delivery + utilization to displaced populations is not working?) + summarise key themes (great) and reach a more analytic solution (introduction of key CHV interventions would mitigate challenges previously identified). The thrust of this is absolutely fine and I strongly believe your data supports you, but the presentation of findings lets you down. 1) Your CLD combines the description of problem with intended intervention solution and I suspect because of that it was extra difficult to analyse the output of the workshop and coherently present findings. Some work is needed here to clear this up - for example, CHVs and their role are not coherently part of the system yet - you are in fact identifying how they could be in order to strengthen overall function so to make that clear, maybe consider structuring results as "current challenges in NCD delivery and

	utilization", then later "potential for CHV programming", and then maybe use colours in your CLD or elaborate two versions? Otherwise links like the one from CHV coordination of care to Coordination between Health Actors seem counter-intuitive in the current CLD. 2) The themes you summarise are often not fully depicted in the CLD - maybe you are depicting the CLD co-developed with participants, and do not want to fully draw on SDM principles and identify feedback loops, all of that is fine. But the responsibility to systematically review links drawn, interrogate them, ensure completeness of the diagram by fully depicting links - i.e. the analytic work that is done by the GMB team post CLD co-creation - does not seem to be finalized. One example: Capacity of the health system and link to Unknown or Untreated Cases - the CLD and text point out that there is a risk inherent in identifying more cases (system capacity being overwhelmed), and that pathway is depicted, but where is the link depicting the current situation, where low capacity means that undiagnosed/untreated cases are possible? Something other than the CHV pathways need to flow into that latter variable and you have a description of how/why this situation has emerged and continues, but that has not made it in here fully? Minor points Abstract Methods: Maybe replace "posit" - sounds a bit academic if you're going for practice implications Results: First time you introduce secondary prevention? Strengths and limitations Is it lack of willingness and/or ability to express views openly? Introduction Lines 17-18: "Traditionally delivered" is an unusual choice here, especially given paragraph two - though I understand where the authors come from - do you mean "predominantly delivered by NGOs in the context of Jordan"? Line 40 - what are emerging LMIC settings? Methods Box 1 - I fully appreciate the clarity here, but descriptions are quite variable (i.e. why does interviewee one almost have a full job title but we know almost nothing on IRC health staff? Also WHO and UNHCR are organizations - so again, not helpful) so please review and standardise I also want to check you and your participants are comfortable with this level of detail which could possibly identify your participants? How did you identify themes? Formal thematic analysis? Or otherwise? Generally consider whether methods follow COREQ fully Seed models - for non-SDM readers, do consider explaining Box 3 - is the final model, not the seed? Box 2- are these the variables in the seed or final model? And who generated them? I was under impression that the research team, but confused by the time I got to results. Or are they the variables after content was agreed with the participants? Lines 41-56 - this is helpful but also begs the question, do you mean

	in workshops each person provided only inputs on their 'own' part of the system? Workshop: To clarify what happened and how persons contributed + what seed model was used, I would be helpful to see an outline of workshop proceedings Data and theory: There are a few references in here describing how data and literature reviews were shared, etc. It would be good to understand A) why? B) how were linkages to this assured overall? C) Was the CLD developed the final one or did the research team then do any further work linking to theory etc? How did you identify areas for strengthening/intervention? No details here on this. Results Minor: The +/- bit on signs needs to go to methods and to explain who made judgments/how. How variables are portrayed and layered by level could also go to methods It seems to me you are then presenting themes in results? Then please signal that and strengthen the methods section. Presentation: there is so much italicized that it actually detracts from key messages Quotes: can these not be integrated with the text? Page 12 line 7: the patient first loses trust and then doesn't make time to do what? Very confused. Box3: Minor edits: This needs to be edited a bit more - enhance text size, ideally locate polarity mid-arrow (when it is at end we then cannot read polarity among multiple arrows pointing to same variable), include a legend (green variables? Red?) Discussion This is not the place to introduce a new component so please revise Generally very well written but again, introducing new data and at the same time interpretation, which should not all be in the discussion.

REVIEWER	Saurav Basu Maulana Azad Medical College, New Delhi, India
REVIEW RETURNED	19-Dec-2020

GENERAL COMMENTS	This manuscript describes a causal loop analysis of the prospects and challenges of integrating CHVs in NCD disease management among Syrian refugees residing in Jordan, based on key informant interviews and training sessions with stakeholders. 1. The article is well-written but the methodology is such that it is based on a theoretical perspective that is not actually drawn from prior pilot or field experience. Although, there are not of suggestions (none particularly novel) but their translation into real-world success stories may lack precedence. Stakeholders should have also included some key informant from amongst the refugee population

	to understand their needs and perspectives. 2. Describe how are CHVs currently, in your setting (if they are) being currently recruited and what is their nationality (Syrian or Jordanian) . What are their minimum educational qualifications and pre-existing training? What kind of honorarium, incentives or payment are they / will they be provided? If already functional, What are their current health related roles and functions? 3. There are other additional challenges for home based care for DM like biomedical waste management and infection control. 4. Assessment of medication adherence may require CHVs to decipher and interpret physician prescriptions, which may be challenging with limited education and training. What other methods do you think will be viable in evaluating medication adherence by the CHVs (pill counts/etc - check doi: 10.4103/tcmj.tcmj_177_18 PMID: 31007485) 5. How are/will CHVs being linked to primary care health facilities and medical professionals (doctors/nurses) in your study setting (discuss concretely in the section on standardized referral pathway) 6. India has a national program for prevention and control of NCDs where community health workers, known as Accredited Social Health Activisits are at the vanguard of screening for NCDs. You may discuss/cite this successful example https://main.mohfw.gov.in/sites/default/files/Module%20for%20Multi-Purpose%20Workers%20-%20Prevention%2C%20Screening%20and%20Control%20of%20Common%20NCDS_2.pdf 7. In results section, include a table or figure describe the sociodemographic composition of the stakeholders who participated in your workshops 8. Include an additional table with literature review encapsulating results of pilot / program experiences for aspects of support towards NCD management by CHVs/CHWs in developing countries or among refugee populations. 9. Was there no discussion on smoking/tobacco/substance abuse cessation strategies using CHVs? 10. Revise the abstract based on the changes made in your manuscript 11. Did this study have IRB approval or was their waiver? Document the same

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dr. K Diaconu, Queen Margaret University Edinburgh
Comments to the Author:

This article was a pleasure to review and I commend the authors for focusing on a relatively neglected topic and for their dedication to identifying pragmatic solution to a pressing health concern among displaced populations. Most of the comments provided are minor, however the major challenge here relates to analysis and presentation of results, which if strengthened would make this an exceptional paper.

Major comments:
This paper points to some critical insights for why NCD care delivery to displaced populations may benefit from community interventions (notably CHVs); there is a lot of valuable data here, however, both analysis and presentation of findings require review and refinement.

The main issue seems to be how to move between descriptive vs. analytic findings- at the minute, the text reads like it wants to do a bit of both but too quickly and often just scratching the surface, relying too much on the reader filling in information. The authors are using the CLD both to describe the problem at hand (how is it that effective NCD delivery + utilization to displaced populations is not working?) + summarise key themes (great) and reach a more analytic solution (introduction of key CHV interventions would mitigate challenges previously identified). The thrust of this is absolutely fine and I strongly believe your data supports you, but the presentation of findings lets you down.
1) Your CLD combines the description of problem with intended intervention solution and I suspect because of that it was extra difficult to analyse the output of the workshop and coherently present findings. Some work is needed here to clear this up - for example, CHVs and their role are not coherently part of the system yet - you are in fact identifying how they could be in order to strengthen overall function so to make that clear, maybe consider structuring results as "current challenges in NCD delivery and utilization", then later "potential for CHV programming", and then maybe use colours in your CLD or elaborate two versions? Otherwise links like the one from CHV coordination of care to Coordination between Health Actors seem counter-intuitive in the current CLD.
2) The themes you summarise are often not fully depicted in the CLD - maybe you are depicting the CLD co-developed with participants, and do not want to fully draw on SDM principles and identify feedback loops, all of that is fine. But the responsibility to systematically review links drawn, interrogate them, ensure completeness of the diagram by fully depicting links - i.e. the analytic work that is done by the GMB team post CLD co-creation - does not seem to be finalized. One example: Capacity of the health system and link to Unknown or Untreated Cases - the CLD and text point out that there is a risk inherent in identifying more cases (system capacity being overwhelmed), and that pathway is depicted, but where is the link depicting the current situation, where low capacity means that undiagnosed/untreated cases are possible? Something other than the CHV pathways need to flow into that latter variable and you have a description of how/why this situation has emerged and continues, but that has not made it in here fully?

Thank you for this important feedback. We have restructured the paper to highlight "current challenges in NCD delivery and utilization" and "potential for CHV programming", as suggested. We have also altered the CLD to incorporate where, explicitly, stakeholders identified how CHVs might impact this complex system. These linkages can now be seen in thick light blue lines.

We have also edited the final CLD to reflect only those linkages that are most important to the discussion, and we hope the CLD is easier to interpret now.

Minor points

Abstract
Methods: Maybe replace "posit" - sounds a bit academic if you're going for practice implications

This has been edited, thank you.

Results: First time you introduce secondary prevention?

This has also been re-worded, thank you. We have opted for more general language in the abstract.

Strengths and limitations
Is it lack of willingness and/or ability to express views openly?

Thank you for this important distinction! We have made this change.

Introduction
Lines 17-18: "Traditionally delivered" is an unusual choice here, especially given paragraph two - though I understand where the authors come from - do you mean "predominantly delivered by NGOs in the context of Jordan"?

We agree with this suggested change in wording, and have made this edit.

Line 40 - what are emerging LMIC settings?

We have deleted "emerging" from this sentence.

Methods
Box 1 - I fully appreciate the clarity here, but descriptions are quite variable (i.e. why does interviewee one almost have a full job title but we know almost nothing on IRC health staff? Also WHO and UNHCR are organizations - so again, not helpful) so please review and standardise
I also want to check you and your participants are comfortable with this level of detail which could possibly identify your participants?

Thank you for this suggestion. We have edited this list to make it more anonymized and consistent. We now list organizations only, as well as the inclusion of CHVs and patients.

How did you identify themes? Formal thematic analysis? Or otherwise? Generally consider whether methods follow COREQ fully

We have filled out the COREQ checklist for this study and will include it in our resubmission. As noted in this sentence, content analysis strategies were used to generate themes.

Seed models - for non-SDM readers, do consider explaining

Upon review, we have opted to term this initial causal loop diagram a "preliminary" causal loop diagram, as a majority of the variables present in the final diagram were included already in this preliminary version (based on interviews of this stakeholder group individually). PP, FR, and RR co-developed the preliminary causal loop diagram in order to provide a platform for stakeholders to improve upon via a multi-phase group model building exercise. So, this was not a "seed" diagram in the traditional sense, but a more detailed one developed based on variables identified during key informant interviews by the research team—and then later refined and finalized during the joint workshop.

Box 3 - is the final model, not the seed?

This is the final model, this has been clarified in the text.

Box 2- are these the variables in the seed or final model? And who generated them? I was under impression that the research team, but confused by the time I got to results. Or are they the variables after content was agreed with the participants?

Thank you for this query. The variables are the final list. The variables were generated by content analysis of qualitative interviews, conducted by PP and FR, and later analyzed by PP and RR. These variables were then presented to and refined by the stakeholders during the causal analysis workshop. This has been clarified in the text.

Lines 41-56 - this is helpful but also begs the question, do you mean in workshops each person provided only inputs on their 'own' part of the system?

Thank you for this important comment. This has been re-written to reflect that each type of stakeholder was invited in order to comment broadly, but with the hopes that they would bring their unique perspective.

Workshop: To clarify what happened and how persons contributed + what seed model was used, I would be helpful to see an outline of workshop proceedings

*This has been provided in **Box 2**.*

Data and theory: There are a few references in here describing how data and literature reviews were shared, etc. It would be good to understand A) why? B) how were linkages to this assured overall? C) Was the CLD developed the final one or did the research team then do any further work linking to theory etc?

In response to A) The following text has been added: "This was done in order to orient stakeholders less familiar with community health approaches, and more familiar with primary care for NCDs, some orientation and context." Not all stakeholders in this region are as aware of this important context—the research team felt this orientation was important in order to ensure full participation by all.

With regards to B and C, the goal of the presentation of data and theory was to provide additional context for stakeholders to use during the workshop—not to embed this work within it. Thus no further formal linkages to this data/theory were undertaken by the research team. This was a conscious choice in order to keep the resulting findings as close to the Jordanian context as possible—as much of the data/theory emanated from differing nations and contexts.

How did you identify areas for strengthening/intervention? No details here on this.

*Text was added to clarify this, in Methods as well as **Box 2,** this was done during the final component of the workshop. Findings have been presented in the results section under the heading "Potential for CHV Programming".*

Results
Minor:
The +/- bit on signs needs to go to methods and to explain who made judgments/how.
How variables are portrayed and layered by level could also go to methods

Thank you, this has been changed.

It seems to me you are then presenting themes in results? Then please signal that and strengthen the methods section.

Thank you for this, we have clarified that we are presenting variables generated by content analysis of interviews of key informants, and later refined by the stakeholder workshop, in the results. We hope this clarifies this.

Presentation: there is so much italicized that it actually detracts from key messages

We are happy to remove italics, but also want to highlight variables in the CLD when mentioned. We welcome the editorial staff's suggestions on the best means to accomplish this.

Quotes: can these not be integrated with the text?

Unfortunately this is not possible within the word limits provided.

Page 12 line 7: the patient first loses trust and then doesn't make time to do what? Very confused.

This has been clarified.

Box3:
Minor edits: This needs to be edited a bit more - enhance text size, ideally locate polarity mid-arrow (when it is at end we then cannot read polarity among multiple arrows pointing to same variable), include a legend (green variables? Red?)

We have eliminated the green variable, as it does not add to this analysis. Central location of the arrows actually results in a more confusing picture, thus the authors have not opted for this. We have modified the arrows to make polarity clearer. We have added a line regarding the central red variable.

Discussion
This is not the place to introduce a new component so please revise
Generally very well written but again, introducing new data and at the same time interpretation, which should not all be in the discussion.

Thank you for this. The strategies identified were collaboratively identified by a small group of stakeholders during discussions, and upon reflection do not truly represent data from the research itself. Thus, these findings have been reframed not as data but as strategies identified in response to findings of this causal loop analysis workshop.

Reviewer: 2
Dr. Saurav Basu, Maulana Azad Medical College
Comments to the Author:
This manuscript describes a causal loop analysis of the prospects and challenges of integrating CHVs in NCD disease management among Syrian refugees residing in Jordan, based on key informant interviews and training sessions with stakeholders.

1. The article is well-written but the methodology is such that it is based on a theoretical perspective that is not actually drawn from prior pilot or field experience. Although, there are not of suggestions (none particularly novel) but their translation into real-world success stories may lack precedence. Stakeholders should have also included some key informant from amongst the refugee population to understand their needs and perspectives.

The methodology of a causal loop analysis is based on the collective review of experiences with a particular intervention; therefore, it is not meant to be based on a study of the intervention itself. Indeed, the next step of this study was intended to operationalize some of the frameworks revealed by the causal loop analysis. In terms of the stakeholders interviewed, we draw this reviewer's attention to the methods. Refugees are among those interviewed, and CHVs themselves are drawn from the refugee population (CHVs were also interviewed).

2. Describe how are CHVs currently, in your setting (if they are) being currently recruited and what is their nationality (Syrian or Jordanian) . What are their minimum educational qualifications and pre-existing training? What kind of honorarium, incentives or payment are they / will they be provided? If already functional, What are their current health related roles and functions?

This has been added to the "Introduction.": CHVs are trained refugees or Jordanians who may or may not have prior health experience. They receive an honorarium to volunteer a limited number of days per month in order to comply with national laws (fifteen out of 30 days). CHVs provide basic health education and referrals to primary care at IRC clinics whehealth issues are identified.

3. There are other additional challenges for home based care for DM like biomedical waste management and infection control.

We agree that there are many challenges for home-based care for diabetes, but given word limits and relevance to this research we do not expand into disease-specific challenges for home-based care in the Introduction.

4. Assessment of medication adherence may require CHVs to decipher and interpret physician prescriptions, which may be challenging with limited education and training. What other methods do you think will be viable in evaluating medication adherence by the CHVs (pill counts/etc - check doi: 10.4103/tcmj.tcmj_177_18 PMID: 31007485)

We agree that there exists a broad scope in evaluating which methods would be useful for evaluating adherence. However, given word limits and relevance to this research, we have not reviewed specific methods in the Introduction.

5. How are/will CHVs being linked to primary care health facilities and medical professionals (doctors/nurses) in your study setting (discuss concretely in the section on standardized referral pathway)

This has been added to the Discussion.

6. India has a national program for prevention and control of NCDs where community health workers, known as Accredited Social Health Activisits are at the vanguard of sscreening for NCDs. You may discuss/cite this successful example https://urldefense.com/v3/__https://main.mohfw.gov.in/sites/default/files/Module*20for*20Multi-Purpose*20Workers*20-*20Prevention*2C*20Screening*20and*20Control*20of*20Common*20NCDS_2.pdf__;JSUlJSUlJSUlJSUl!!LIr3w8kk_Xxm!-y-44ZTC6-9Dn-kcJDr9HZXOWPV3d8qRamDOjKsCjZQy_N3d8GgLlqrqXJ-9Vw$

Thank you we have added a citation to the evaluation of the Accredited Social Health Activist program (https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-018-3140-8).

7. In results section, include a table or figure describe the sociodemographic composition of the stakeholders who participated in your workshops

Specific data on the demographics of respondents were not collected, as we intended to keep the identities of the respondents anonymous. Participants are mutual colleagues, supervisors, and UN/WHO representatives, MoH representatives, etc, and therefore, this data would be quite sensitive to collect. In addition, we do not feel this information affects the validity of the responses.

8. Include an additional table with literature review encapsulating results of pilot / program experiences for aspects of support towards NCD management by CHVs/CHWs in developing countries or among refugee populations.

While we agree this is important context for the reader, the word limit and space limitations make this impractical to include.

9. Was there no discussion on smoking/tobacco/substance abuse cessation strategies using CHVs?

Yes, this was discussed and a line to this effect has been included in the results section: The patient's capacity for self-care and health literacy was deemed central to appropriate management of diabetes and hypertension. This includes patient understanding of the chronic nature of their disease and

treatment, the need for daily medication, routine dietary and exercise needs and avoidance of harmful behaviors such as smoking, and timely identification of complications.

10. Revise the abstract based on the changes made in your manuscript

Thank you, revisions have been made.

11. Did this study have IRB approval or was their waiver? Document the same

This is documented in the "Ethics/Consent" portion, we ask the reviewer to kindly review.

VERSION 2 – REVIEW

REVIEWER	Karin Diaconu Queen Margaret University Edinburgh, Institute for Global Health and Development
REVIEW RETURNED	20-Mar-2021

GENERAL COMMENTS	Thank you to authors for the thorough revisions presented - I believe the manuscript has been strengthened via this process and now reads very well. Minor comments: 1) Please replace 'systems dynamics' to 'system dynamics' when referencing the methodology. 2) Please do one final copy-edit of the manuscript, in some places deletion of text has resulted in some typographical errors.

REVIEWER	Saurav Basu Maulana Azad Medical College
REVIEW RETURNED	11-Mar-2021

GENERAL COMMENTS	No further comments

VERSION 2 – AUTHOR RESPONSE

We thank you for these reviews. We have made the suggested changes, and submit this manuscript for your consideration.