

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Barriers to climate change and health research in India: A qualitative study
AUTHORS	Shrikhande, Shreya; Merten, Sonja; Cambaco, Olga; Lee, Tristan T; Lakshmanasamy, Ravivarman; Röösl, Martin; Dalvie, Mohammad; Utzinger, Jürg; Cissé, Guéladio

VERSION 1 – REVIEW

REVIEWER	Rocque, Rhea The University of Winnipeg
REVIEW RETURNED	21-Apr-2023

GENERAL COMMENTS	<p>This paper aims to explore the perceptions of stakeholders involved in environmental health research and action concerning the barriers to conducting research on environmental health. It is a very pertinent study which sheds light on what can be done to promote such important research. Thank you to the authors for this work!</p> <p>Overall, this study is relevant and a sound methodology is used. The elements required to understand this study and deem it rigorous and relevant are present in each section of the text, but the text needs to undergo a major revision (mostly for linguistic reasons) to 1) tighten the text (text is long and could easily be tightened a lot - some paragraphs could be reduced to one sentence) and 2) to be more precise with wording (rewording, clarifying some aspects, splitting some long sentences in two to specify the ideas conveyed). This may simply be due to language, however, at times it makes it difficult to understand the ideas presented in the text.</p> <p>Additionally, here are some specific comments:</p> <p>INTRODUCTION: This is an extremely important topic to explore to fill the gap in environmental health research. The aim and the pertinence of the study is well justified.</p> <p>The only thing I would suggest adding in the introduction to build a coherent narrative is a few sentences on the current state of literature concerning health workforce perceptions of environmental health research (not only in India). For example, are there many other studies looking at peoples' perceptions of barriers and facilitators to environmental health research? Or is this a first study in its kind. This information could help situate your study in the current literature. Some literature is discussed in the discussion, but these studies could be briefly mentioned in the</p>
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	<p>intro while highlighting their limitations and what the current study brings to bridge these gaps.</p> <ul style="list-style-type: none"> - I would recommend reformulating the sentence at lines 117-120 – there seems to be various ideas presented in this sentence, but they are not clearly conveyed. For example, specify who this group is (health workforce?) ‘needs and barriers for their appropriate level of engagement and action’, their perceived research needs? And barriers to research? - For the aim of the study, please clarify whether you mean action-research (as a research methodology) or whether you mean to explore the barriers on environmental health action and research. - Some sentences should be revised for English. E.g. line 126 – we also highlighted the specific challenges and barriers to conducting research on CVDs – only a suggestion. <p>METHODS:</p> <ul style="list-style-type: none"> - Lines 135 – seems like dashes are required to specify that we’re talking about a hospital. - Some sentences seem longer, wordy and more redundant than they need. E.g. line 143 – instead of ‘A total of’, simply state Sixteen semi-structured... etc. Lines 143-144 – could state January and March 2022 to cut back on wordiness - Lines 127-128 can be deleted. It is clearly stated in the objective that you’re focusing on barriers and not facilitators. - Please clarify lines 143-144, do you mean that most interviews were conducted in person in Puducherry, but that 2 were conducted via zoom, but still with participants in Puducherry? - Please clarify what is meant by sentence line 149-150 – do you mean that you have a smaller sample size due to these restrictions? If it’s simply to state that it complicated the research process, I would recommend deleting this sentence to shorten the text. If you have a concrete barrier to research or an information that contextualizes the limitation of the study, please state it directly instead - Line 153-154 unclear – please clarify. 16 participants, 11 practicing doctors – not equal to only 5 others? This is how I understand it the way it is stated. - Paragraph 153-160, I would suggest putting it as the first sub section of the Results section, including Table S2 to help visualize the summary of the information (frequencies and categories of participants would be clearer and you could cut down on the text). A minor change I’d suggest to ST2: delete the last row of total and simply insert the n in the title of the columns. E.g. Female (n = 3), etc. N = 16 - actively engaged as line 155 – maybe actively working as? - Lines 161-163. Divide in two sentences – Field note idea could be the second sentence. No need to specify ‘simple’
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	<p>- I'd recommend presenting ethical information earlier in methods section. Also, consider making it shorter – it is unnecessary to describe the concrete informed consent process – it is assumed as soon as you state having an ethical approval and obtaining written informed consent from participants. (lines 189-192 could be deleted and replaced by a short statement)</p> <p>- Sentences 193 could be moved above where you specify that SS carried out the interviews. Please rearrange order of presentation of information in methods section.</p> <p>- It is specified that SS wanted to minimize bias - but it unclear which bias and how field notes could help do this? Please specify what is meant here, but if it is simply the bias inherent to qualitative research, not necessary to discuss it - it is implied.</p> <p>- Sentence 166-167 – this sentence suggests that transcription can be done via max qda soft ware, is this the case? If not, please clarify this sentence as well. Could divide this sentence by stating in this paragraph that interview were transcribed verbatim by SS. In the next paragraph, could specify the software used – as I understand both SS and TL coded?</p> <p>- Line 168 – ‘we followed’ and ‘was used’ – choose one of the other.</p> <p>From this point on, I will not comment specifically on language, but generally, the whole manuscript should be reviewed for the quality of English.</p> <p>- Line 170 – which framework? Please specify. I see this framework is specified below, please review order of presentation of information or point to it by saying it is discussed below...</p> <p>- How did SS and TL independently validate the codebook? Please specify - did both code x amount of interviews?</p> <p>- Unclear what you mean when you talk about a matrix – do you simply mean the codebook that you put in a table format?</p> <p>RESULTS: Suggest moving the methods paragraph describing your participants to the first section of results section.</p> <p>Also I would challenge the authors to come up with a way of visualizing your qualitative findings. Qualitative findings tend to be harder to digest and to remember the key messages, so it's helpful to go one step further and offer a visualization of the themes which also details the relationship between the themes and their relative importance to participants.</p> <p>Your TableS3 is useful to help the reader understand the hierarchy of themes, but something shorter, concise and more visual would go a long way to help guide the reader through your themes and through remembering your key messages. Such is the challenge of qualitative findings.</p> <p>A figure would also help understand the hierarchy of themes and their relative importance (e.g., which theme was discussed in more</p>
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detail by participants?). For example, institutional determinants and political and institutional barriers seem to be the same level to me? Maybe add a larger sub title for this category ?

Here are more specific suggestions:

- Paragraph lines 208-212 could be summarized in one sentence.

- First, we report on the findings concerning participations knowledge and perceptions about (one or two words to describe this theme), then we explore the specific barriers to CVD research. No need to remind us that it's the objective...

Also as its presented, I expected a section about institutional barriers and then a separate section on barriers to CVD research, but that's not how it seems to be organized. Maybe clarify if what you mean is that within all the institutional barrier themes you also discuss the specificities to CVD research.

- Paragraph 225-228 unclear – please specify this theme and nuance.

- I also wonder what language were the interviews conducted in? If not in English, it should be specified if the quotes were translated. If they were translated for this paper, I would suggest reviewing the grammar and language to make sure the ideas are clearly conveyed.

- I would argue that paragraph 225-228 goes in the political barrier theme... but the idea presented in this paragraph should be clarified and maybe it belongs where it is.

- Please review results section for wordiness and clearness of presentation of themes overall. I feel like this section could be shorten by half and tightened as many themes seem to echo each other.

- Also, quotes are extremely important, but the text is long and some quotes are redundant. Please consider reviewing the quotes and only keeping the essential that is necessary to illustrate the theme (of course, not editing participants' discourse, but eliminating the text that isn't necessary to convey the idea of the theme). E.g. could delete quote lines 292-294 and keep the quotes for the more complex themes or those that need a quote to help reader understand where it's coming from...

- Also since you have additional quotes in the Suppl. Files, please consider moving some directly in the supplementary files. Usually, it's recommended to have at least one quote per sub-section, but not necessary to have more than that (you have 3 in one subsection at times). Also, considering your sub-sections can be greatly synthesized and summarized, it may come down to one quote only.

- Line 312 – mentioned that one of the strongest theme was: X. This is great, I would like to see more of this interpretive information in the results section. For example, how did you choose which theme to present first? According to importance of participants? Frequencies? What is the relationship between the themes? Are there themes that weren't discuss in as much passion and detail as others? Please contextualize the findings

this way throughout the results section. Then specify what you mean by strongest theme (as told by frequencies? Length of discussion of this theme? In-depth discussion?). I'd argue it could be coherent to present the themes in order of their importance or strength and to state this in the beginning of results section.

- Example of where you could cut: lines 326-336, instead of presenting the quotes, simply summarize in one sentence the incongruent views. Another example of what to cut, line 338 'cut as potential options to...' this is assumed.

- Another example of where to shorten and cut – line 345-346 this idea was already presented above – this means that this theme could likely be collated with previous theme or summarized

DISCUSSION

Overall, the same comment applies to this section. The ideas are present, but they are presented in a wordy and unclear manner. It would greatly help comprehension if the text was shortened and reviewed for language. Also, please consider using strategies to make your study conclusions more explicit. At times, it is unclear whether the idea you present is based on your data, observations or other literature. For example, you could specify: We identified 4 key findings. Then summarize the four key information you want readers to take away, while linking it to previous literature and offering recommendations.

- Sentence 522: be more precise: (remove 'mainly') This research examined barriers faced in.... according to (describe participants again) in Puducherry. These localized findings remain relevant to inform other contexts in India and can...

- As mentioned in the introduction – what is the state of research elsewhere on healthcare workers perceptions of environmental health research? Do the findings of your study echo to these other studies? What are the differences and specificities of your context? What is similar to other contexts? Please situate your study in the previous literature.

- please clarify Line 529 'we found' – this is your perception or is it based on most of your participants not knowing about this?

Again, I'd recommend adding one or two sentences early on in the discussion to summarize how many general themes and their names, to remind the reader of the structure of your coding tree (which is another positive aspect of a figure, easier for the reader to organize and visualize the info so they can take it away and remember).

This is just a suggestion to help the discussion be clearer in organization, you could state: we identify X key observations based on our findings. Then one or two paragraphs for each key observations stated.

I see reference 26 seems to have explored something similar to your study. This is an example of a study that would be good to mention in the intro to situate your work. i.e. have lots of these perceptions studies been done in India so far? What are their limits? What's your study adding? Etc.

	<p>Sentence line 605 is an example of sentence that could be deleted to reduce wordiness. 'This study had a few limitations'.</p> <p>Line 610 'We could not', use precise language: we did not.</p> <p>Sample size limited by COVID, in which way, less people were available to participate because of COVID? I'd argue that a sample size of 16 is good enough for an exploratory qualitative study – not necessarily a limitation then.</p>
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REVIEWER	Soman, Biju Sree Chitra Tirunal Institute for Medical Sciences and Technology, Achutha Menon Centre for Health Sciences Studies
REVIEW RETURNED	08-May-2023

GENERAL COMMENTS	<p>This is a well-written manuscript on a relevant topic. The readability of the manuscript will improve if the authors consider the following. One, a bit more tidying of the manuscript; as of now, there are many repetitions and going back and forth in the narration. It would be good if the positionality of the investigators were placed before going to the observations, as stipulated in the COREQ checklist. I was surprised that the investigators had not enquired about the One Health initiative, a hot topic in India's health system over the last few years and is very much linked to climate change. I see this as one major limitation of the study, the disconnect between the terms/languages used by physicians and scientists. I feel the responses from the physicians would have been much more forthcoming if the investigators has used the term One Health.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dr. Rhea Rocque, The University of Winnipeg

Comments to the Author:

This paper aims to explore the perceptions of stakeholders involved in environmental health research and action concerning the barriers to conducting research on environmental health. It is a very pertinent study which sheds light on what can be done to promote such important research. Thank you to the authors for this work!

Overall, this study is relevant and a sound methodology is used. The elements required to understand this study and deem it rigorous and relevant are present in each section of the text, but the text needs to undergo a major revision (mostly for linguistic reasons) to 1) tighten the text (text is long and could easily be tightened a lot - some paragraphs could be reduced to one sentence) and 2) to be more precise with wording (rewording, clarifying some aspects, splitting some long sentences in two to specify the ideas conveyed). This may simply be due to language, however, at times it makes it difficult to understand the ideas presented in the text.

Response: Thanks for these comments and suggestions. We carefully revised our piece and tightened up where possible and further improved clarity. To readily assist you in assessing our revisions, we used TrackChanges and indicate line numbers referring to the track-changed version.

Additionally, here are some specific comments:

INTRODUCTION:

This is an extremely important topic to explore to fill the gap in environmental health research. The aim and the pertinence of the study is well justified.

Response: Thanks for your overall positive appraisal of our research. We are grateful for your comments and feedback to improve the paper.

Comment 1: The only thing I would suggest adding in the introduction to build a coherent narrative is a few sentences on the current state of literature concerning health workforce perceptions of environmental health research (not only in India). For example, are there many other studies looking at peoples' perceptions of barriers and facilitators to environmental health research? Or is this a first study in its kind. This information could help situate your study in the current literature. Some literature is discussed in the discussion, but these studies could be briefly mentioned in the intro while highlighting their limitations and what the current study brings to bridge these gaps.

Response: This is a good point, which we have addressed with enthusiasm (see revised manuscript, track-changed version, lines 128-131).

Comment 2: - I would recommend reformulating the sentence at lines 117-120 – there seems to be various ideas presented in this sentence, but they are not clearly conveyed. For example, specify who this group is (health workforce?) 'needs and barriers for their appropriate level of engagement and action', their perceived research needs? And barriers to research?

Response: The respective sentence has been reworded as follows: "Given the present gaps in this domain, it is particularly important to understand what research barriers and needs are perceived by health professionals" (see revised manuscript, track-changed version, lines 130-131).

Comment 3: - For the aim of the study, please clarify whether you mean action-research (as a research methodology) or whether you mean to explore the barriers on environmental health action and research.

Response: The respective sentence has been revised and clarity enhanced (see revised manuscript, track-changed version, line 136).

Comment 4:- Some sentences should be revised for English. E.g. line 126 – we also highlighted the specific challenges and barriers to conducting research on CVDs – only a suggestion.

Response: We thank Reviewer #1 for reading our piece so carefully. We adhered to this suggestion (see revised manuscript, track-changed version, lines 140-141).

METHODS:

- Lines 135 – seems like dashes are required to specify that we're talking about a hospital.

Response: We are not sure what Reviewer #1 meant by "dashes are required...". In any event, we modified the wording for the sake of clarity (see revised manuscript, track-changed version, line 149).

- Some sentences seem longer, wordy and more redundant than they need. E.g. line 143 – instead of 'A total of', simply state Sixteen semi-structured... etc. Lines 143-144 – could state January and March 2022 to cut back on wordiness

Response: We tightened up the entire manuscript. As regards the specific suggestion, we followed Reviewer #1's suggestions (see revised manuscript, track-changed version, lines 157-159).

- Lines 127-128 can be deleted. It is clearly stated in the objective that you're focusing on barriers and not facilitators.

Response: We have deleted this sentence.

- Please clarify lines 143-144, do you mean that most interviews were conducted in person in Puducherry, but that 2 were conducted via zoom, but still with participants in Puducherry?

Response: This sentence has been clarified (see revised manuscript, track-changed version, lines 157-159).

- Please clarify what is meant by sentence line 149-150 – do you mean that you have a smaller sample size due to these restrictions? If it's simply to state that it complicated the research process, I would recommend deleting this sentence to shorten the text. If you have a concrete barrier to research or an information that contextualizes the limitation of the study, please state it directly instead.

Response: We have deleted the sentence as it pertained to complications in the recruitment. Study limitations have been discussed in the relevant section.

- Line 153-154 unclear – please clarify. 16 participants, 11 practicing doctors – not equal to only 5 others? This is how I understand it the way it is stated.

Response: Thank you for catching this. We meant that 8 were practicing physicians and 8 were researchers, either with a medical or an environmental background. This has now been clarified (see revised manuscript, track-changed version, lines 168-174).

- Paragraph 153-160, I would suggest putting it as the first sub section of the Results section, including Table S2 to help visualize the summary of the information (frequencies and categories of participants would be clearer and you could cut down on the text). A minor change I'd suggest to ST2: delete the last row of total and simply insert the n in the title of the columns. E.g. Female (n = 3), etc. N = 16

Response: We added a participants' profile table as suggested by reviewer 1. However, we think it is important to clarify the background of the study participants, especially since we targeted participants purposively, in the methods (see revised manuscript, track-changed version, lines 168-177).

- actively engaged as line 155 – maybe actively working as?

Response: We revised and simply used the term 'working' (see revised manuscript, track-changed version, line 168).

- Lines 161-163. Divide in two sentences – Field note idea could be the second sentence. No need to specify 'simple'

Response: We revised as per Reviewer #1's suggestion (see revised manuscript, track-changed version, lines 186-187).

- I'd recommend presenting ethical information earlier in methods section. Also, consider making it shorter – it is unnecessary to describe the concrete informed consent process – it is assumed as soon

as you state having an ethical approval and obtaining written informed consent from participants. (lines 189-192 could be deleted and replaced by a short statement)

Response: We feel strongly that providing sufficient information regarding ethical consideration is part of good epidemiological reporting and scientific practice. Hence, we only slightly shortened the sentence (see revised manuscript, track-changed version, lines 215-219).

- Sentences 193 could be moved above where you specify that SS carried out the interviews. Please rearrange order of presentation of information in methods section.

Response: We moved this information as per Reviewer #1's suggestion (see revised manuscript, track-changed version, lines 186-189).

- It is specified that SS wanted to minimize bias - but it unclear which bias and how field notes could help do this? Please specify what is meant here, but if it is simply the bias inherent to qualitative research, not necessary to discuss it - it is implied.

Response: We were referring to the bias inherent in qualitative studies. Hence, we deleted "to minimize bias", as recommended (see revised manuscript, track-changed version, line 188).

- Sentence 166-167 – this sentence suggests that transcription can be done via max qda soft ware, is this the case? If not, please clarify this sentence as well. Could divide this sentence by stating in this paragraph that interview were transcribed verbatim by SS.

In the next paragraph, could specify the software used – as I understand both SS and TL coded?

Response: Indeed, transcription was directly done on MaxQDA software version 2018.1 (VERBI Software, Berlin, Germany), using their in-built playback function.

- Line 168 – 'we followed' and 'was used' – choose one of the other.

Response: Thank you for pointing out this error, which we rectified (see revised manuscript, track-changed version, line 194)

From this point on, I will not comment specifically on language, but generally, the whole manuscript should be reviewed for the quality of English.

Response: We have carefully reviewed the manuscript and made several edits.

- Line 170 – which framework? Please specify. I see this framework is specified below, please review order of presentation of information or point to it by saying it is discussed below...

Response: We addressed this issue and now mentioned that the framework is discussed in greater detail later on (see revised manuscript, track-changed version, line 196).

- How did SS and TL independently validate the codebook? Please specify - did both code x amount of interviews?

Response: Yes, both independently coded 3 interviews, which were the richest in quality and then subsequently conferred for the remaining interviews in case there were grey areas. We have now added a sentence to reflect on our methodology (see revised manuscript, track-changed version, lines 201-202).

- Unclear what you mean when you talk about a matrix – do you simply mean the codebook that you put in a table format?

Response: Yes, we refer to the matrix of the quotes and attached codes, which are charted to specify the main themes.

Suggest moving the methods paragraph describing your participants to the first section of results section.

Response: We thought about this. However, as the participants were purposively selected, we do not think their characteristics should be in the results, but rather in the methods as it is important to clarify that we targeted people with a certain background (see revised manuscript, track-changed version, lines 168-174).

Also I would challenge the authors to come up with a way of visualizing your qualitative findings. Qualitative findings tend to be harder to digest and to remember the key messages, so it's helpful to go one step further and offer a visualization of the themes which also details the relationship between the themes and their relative importance to participants.

Your TableS3 is useful to help the reader understand the hierarchy of themes, but something shorter, concise and more visual would go a long way to help guide the reader through your themes and through remembering your key messages. Such is the challenge of qualitative findings.

A figure would also help understand the hierarchy of themes and their relative importance (e.g., which theme was discussed in more detail by participants?). For example, institutional determinants and political and institutional barriers seem to be the same level to me? Maybe add a larger sub title for this category ?

Response: Thank you for this insight. This is a great comment! We added a figure that should help the reader visualizing the main themes and findings of our study and highlight the connections between the themes and subthemes (see revised manuscript, Figure 2, referenced on line 238). Additionally, we have also renamed the 'institutional framework theme on line 247).

Here are more specific suggestions:

- Paragraph lines 208-212 could be summarized in one sentence.

- First, we report on the findings concerning participations knowledge and perceptions about (one or two words to describe this theme), then we explore the specific barriers to CVD research. No need to remind us that it's the objective...

Also as its presented, I expected a section about institutional barriers and then a separate section on barriers to CVD research, but that's not how it seems to be organized. Maybe clarify if what you mean is that within all the institutional barrier themes you also discuss the specificities to CVD research.

Response: Thanks for the suggestion, which we have addressed (see revised manuscript, track-changed version, lines 237-244). Moreover, we edited the main themes and numbered them for clarity. They are presented as described in the first paragraph starting with policy knowledge (institutional framework), then the three main institutional barriers. CVD specific barriers are not a separate section, but rather highlighted in the 3 main barriers. The text has also been modified to reflect this along with a figure to enhance clarity.

- Paragraph 225-228 unclear – please specify this theme and nuance.

Response: We specified the respective sentence (see revised manuscript, track-changed version, lines 260-262).

- I also wonder what language were the interviews conducted in? If not in English, it should be specified if the quotes were translated. If they were translated for this paper, I would suggest reviewing the grammar and language to make sure the ideas are clearly conveyed.

Response: The interviews were conducted in English. While we made some grammatical edits to enhance clarity, we have chosen not to further alter the language at the cost of losing on nuances that come with the English spoken in Puducherry.

- I would argue that paragraph 225-228 goes in the political barrier theme... but the idea presented in this paragraph should be clarified and maybe it belongs where it is.

Response: We have modified this section to reflect this and slightly reworded in this thematic section.

- Please review results section for wordiness and clearness of presentation of themes overall. I feel like this section could be shorten by half and tightened as many themes seem to echo each other.

Response: We have made several changes to the results section and tighten up quite considerably.

- Also, quotes are extremely important, but the text is long and some quotes are redundant. Please consider reviewing the quotes and only keeping the essential that is necessary to illustrate the theme (of course, not editing participants' discourse, but eliminating the text that isn't necessary to convey the idea of the theme). E.g. could delete quote lines 292-294 and keep the quotes for the more complex themes or those that need a quote to help reader understand where it's coming from...

Response: We carefully revised and tightened up the results section and omitted some of the quotes to avoid redundancies.

- Also since you have additional quotes in the Suppl. Files, please consider moving some directly in the supplementary files. Usually, it's recommended to have at least one quote per sub-section, but not necessary to have more than that (you have 3 in one subsection at times). Also, considering your sub-sections can be greatly synthesized and summarized, it may come down to one quote only.

Response: We have moved some quotes to the Supplementary section (eg from 3.2, 4.1 and 4.3). However, in cases where the theme highlights several points, as in the case of the CVD research specific barriers, we have retained multiple quotes in the main text to support our interpretation.

- Line 312 – mentioned that one of the strongest theme was: X. This is great, I would like to see more of this interpretive information in the results section. For example, how did you choose which theme to present first? According to importance of participants? Frequencies? What is the relationship between the themes? Are there themes that weren't discuss in as much passion and detail as others? Please contextualize the findings this way throughout the results section. Then specify what you mean by strongest theme (as told by frequencies? Length of discussion of this theme? In-depth discussion?). I'd argue it could be coherent to present the themes in order of their importance or strength and to state this in the beginning of results section.

Response: We like this idea very much. Hence, we made some changes to reflect this issue on line 357 and modified elsewhere in the results section. The themes however, are presented in the original form, which are based in a sort of hierarchy. Starting from policies and government to institutions and then finally individual or general barriers. We have also modified the titles and numbered the themes for improved clarity.

- Example of where you could cut: lines 326-336, instead of presenting the quotes, simply summarize in one sentence the incongruent views. Another example of what to cut, line 338 'cut as potential options to...' this is assumed.

Response: We revised accordingly (see revised manuscript, track-changed version, lines 372-383).

- Another example of where to shorten and cut – line 345-346 this idea was already presented above – this means that this theme could likely be collated with previous theme or summarized

Response: We tightened up the first theme to avoid redundancies, but kept this section as is.

DISCUSSION

Overall, the same comment applies to this section. The ideas are present, but they are presented in a wordy and unclear manner. It would greatly help comprehension if the text was shortened and reviewed for language. Also, please consider using strategies to make your study conclusions more explicit. At times, it is unclear whether the idea you present is based on your data, observations or other literature. For example, you could specify: We identified 4 key findings. Then summarize the four key information you want readers to take away, while linking it to previous literature and offering recommendations.

Response: This is a good point. We have made several changes throughout the discussion, including a sentence on line 579 specifying that we will discuss the four main findings.

- Sentence 522: be more precise: (remove 'mainly') This research examined barriers faced in.... according to (describe participants again) in Puducherry. These localized findings remain relevant to inform other contexts in India and can...

Response: We made the requested changes (see revised manuscript, track-changed version, line 576).

- As mentioned in the introduction – what is the state of research elsewhere on healthcare workers perceptions of environmental health research? Do the findings of your study echo to these other studies? What are the differences and specificities of your context? What is similar to other contexts? Please situate your study in the previous literature.

Response: This important point has been addressed throughout the discussion.

- please clarify Line 529 'we found' – this is your perception or is it based on most of your participants not knowing about this?

Response: We now use the term "there was" to reflect that it was based on the participants not knowing about it (see revised manuscript, track-changed version, line 585).

Again, I'd recommend adding one or two sentences early on in the discussion to summarize how many general themes and their names, to remind the reader of the structure of your coding tree (which is another positive aspect of a figure, easier for the reader to organize and visualize the info so they can take it away and remember).

Response: This point has been addressed and we now provide a new figure that visualizes the key themes explored in our study (see revised manuscript, Figure 2).

This is just a suggestion to help the discussion be clearer in organization, you could state: we identify X key observations based on our findings. Then one or two paragraphs for each key observations stated.

Response: We like this suggestion, address it and feel that the structure of our Discussion is improved now (see revised manuscript, several changes in the discussion section).

I see reference 26 seems to have explored something similar to your study. This is an example of a study that would be good to mention in the intro to situate your work. i.e. have lots of these perceptions studies been done in India so far? What are their limits? What's your study adding? Etc.

Response: We addressed this point and provide cross-reference to the respective publication already in the Introduction (see revised manuscript, track-changed version, lines 128-130).

Sentence line 605 is an example of sentence that could be deleted to reduce wordiness. 'This study had a few limitations'.

Response: We followed Reviewer #1's suggestion and deleted the respective sentence.

Line 610 'We could not', use precise language: we did not.

Response: We have made this correction (see revised manuscript, track-changes version, line 675).

Sample size limited by COVID, in which way, less people were available to participate because of COVID? I'd argue that a sample size of 16 is good enough for an exploratory qualitative study – not necessarily a limitation then.

Response: Clearly, the COVID-19 pandemic and the measured in place at the time, was a major challenge for our study. Yet, we are delighted to learn that Reviewer #1 feels that a sample size of 16 is reasonable for an exploratory qualitative study. Hence, we omitted this study limitation. As a result, our piece is further tightened up.

Reviewer: 2

Dr. Biju Soman, Sree Chitra Tirunal Institute for Medical Sciences and Technology

Comments to the Author:

This is a well-written manuscript on a relevant topic. The readability of the manuscript will improve if the authors consider the following. One, a bit more tidying of the manuscript; as of now, there are many repetitions and going back and forth in the narration. It would be good if the positionality of the investigators were placed before going to the observations, as stipulated in the COREQ checklist. I was surprised that the investigators had not enquired about the One Health initiative, a hot topic in India's health system over the last few years and is very much linked to climate change. I see this as one major limitation of the study, the disconnect between the terms/languages used by physicians and scientists. I feel the responses from the physicians would have been much more forthcoming if the investigators has used the term One Health.

Response: Thank you for your overall positive feedback to our manuscript. We substantially revised and tightened up our manuscript. Please note that the current manuscript complements a previous publication, which pertains to knowledge and perspectives on climate change and health in the same

study area. In the former manuscript, the topic of One-Health has been discussed. We now provide cross-reference to this recent publication (see revised manuscript, reference 29). We have included research positionality in the methods section (see revised manuscript, track-changed version, lines 215-219).

VERSION 2 – REVIEW

REVIEWER	Soman, Biju Sree Chitra Tirunal Institute for Medical Sciences and Technology, Achutha Menon Centre for Health Sciences Studies
REVIEW RETURNED	18-Aug-2023
GENERAL COMMENTS	A bit more tightening of the article is required, as there are many more redundancies. Language editing is essential.

VERSION 2 – AUTHOR RESPONSE