PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Applying the Three Delays Model to understand emergency care seeking and delivery in rural Bangladesh: a qualitative study
AUTHORS	Shah, Bansari; Krishnan, Nandita; Kodish, Stephen; Yenokyan, G; Fatema, Kaniz; Burhan Uddin, Kazi; Rahman, AKM; Razzak, Junaid

VERSION 1 – REVIEW

REVIEWER	Mónica Pajuelo Universidad Peruana Cayetano Heredia Perú
REVIEW RETURNED	15-Aug-2020

GENERAL COMMENTS	The authors aim to explain factors that take to bad outcomes in medical emergencies using the three delays model. This model was originally applied to study underlying causes of maternal deaths assuming that prompt health care is important to avoid them. It seems reasonable that this model could be applied to any medical emergency where an early intervention is desired. However, it is not very clear in the manuscript that the three delays model is the most suitable to try to understand the factors that influence the outcomes in medical emergencies. In the abstract they state that the goal of the study is to "apply the three delays model to", but this model is a framework to understand the underlying factors, and not the goal of a study. In the methodology section I think it is necessary to describe in more detail how the participants were selected. Why the selected participants were more appropriate for this study? Also, how was the selection of subjects for the interviews? Were all adults? How was the guide of the interviews or focus groups constructed? Is it available? In my opinion, that information should be more clear. Were the original guides in English or in the local language? How it was assured that the translation from the original language to English was accurate? In the results section For Delay 1, it is stated that the decision is complex; however it is not clear that there is an actual delay after the occurrence of an emergency. Emergency is a broad topic; some situation may be more evident than others. Figure 2 needs more explanation Later in the Recommendations to improve emergency care, there is an argument about that the decision of seeking care is also influenced by the perceived expertise of the health providers. This is not considered in that topic (Delay 1). In the Discussion section there is information that is not in the results section. For instance it says that “cultural factors underpin health-related decisions ... particularly in younger women“

	Also in the Limitations and strengths there is information that should be considered in the methods and results section, such as selection of participant and their characteristics. I disagree with the conclusion that “delays … contribute to adverse outcomes from emergency”. This is a statement that cannot be concluded from the results.

REVIEWER	Jamila Nabieva Heidelberg Institute of Global Health (HIGH), University Hospital Heidelberg Im Neuenheimer Feld 365, 69120, Heidelberg, Germany Email: jamila.nabieva@uni-heidelberg.de
REVIEW RETURNED	17-Aug-2020

GENERAL COMMENTS	**Introduction** The manuscript in question sets an intersecting objective of applying the Three Delays Model (Thaddeus and Maine, 1994) traditionally used in pregnancy and childbirth research to the domain of emergency medical care seeking and delivery. The *Introduction* section demonstrates the need to improve the emergency and acute care seeking and delivery in Bangladesh, and justifies the application of the Three Delays Model framework to achieve the study objectives. **Methods** While the authors’ choice of the Three Delays Model as the conceptual framework is clearly justified, and the qualitative data collection and analysis approach is habitually inherent to the Three Delays Model, I would like to share a number of specific comments that pertain to good practice in reporting qualitative studies, and hope the authors will find them useful: **P.8, Line 46:** Were the data collection tools originally developed in Bengali, or developed in English and translated into Bengali? If the latter, was the back translation into English performed? Were the data collection tools pilot-tested prior to the study? **P.9, Lines 8-9:** Authors may want to consider specifying (a) the sampling method here as well (mentioned in the “Strengths and Limitations” section); (b) whether participants for IDIs – healthcare professionals – were also recruited by local community leaders. **P.9, Lines 10-17:** In case the two data collectors are among the authors, you may want to specify them (initials). If data collectors are not among the authors, you may want to describe how the accuracy of the data analysis has been ensured (e.g. at least one of the authors who analyzed the data - NK and SK - is familiar with the study setting/language, in order to ensure that no important notions had been lost in translation; whether there were any difficulties in translating certain notions/phenomena/practices into English, and how they were addressed, etc.) **P.9, Lines 20-32:** Authors may want to add a short sentence about the duration of FGDs and IDIs. **P.9, Line 27:** What defined the number of IDIs? Was is based on

	the convenience (e.g. no more health professionals were available for interviews), or saturation (data collectors stopped recruiting health professionals when no new relevant knowledge was being obtained)? **P.9, Lines 50-51**: Authors may want to add the initials of the data analysts here as well. **P.9, Lines 50-51**: The sentence states that the themes were "identified by the data analysts". Considering the semi-structured nature of data collection tools, had the major themes not emerged during the study conception phase when the data collection tools were developed? **Results** The overall structure of the *Results* section that presents the findings along the two main categories – (1) Three Delays Model and (2) Recommendations to improve emergency care – reflects the 2 objectives of the study. While *Recommendations to improve emergency care* cannot be scrutinized, as they represent the opinions of service providers and community members, authors may consider minor changes/revisions to the structure in the first part of the *Results* section: • Considering that data collection tools for the two study groups covered different themes and had different objectives (P.8, Line 50 – P.9, Line 8), authors must have collected a large body of data that could afford presenting results by two different groups – community members and services providers, - and not only according to the three delays. In the current version, findings under Delay 1 and Delay 2 are based almost exclusively on the responses of community members, while Delay 3 predominantly reports the findings of interviews with service providers. Having the community members' perceptions/experiences of actual delays in receiving care (Delay 3) would offer a more logical completion to this section. • Alternatively, if available data allow, authors might consider reporting findings from both groups – *service providers and community members* – within the three delays equally. • **P.16, Lines 28-35:** The quote feels misplaced. While it raises a critical issue of shortage of female health workers and cultural barriers to accessing care, the quote does not directly support the preceding sentence. • General comment to quotes: authors may want to revisit the consistency of identifiers throughout the text. E.g. "Healthcare provider" which is used several times, appears numbered in some instances, and unnumbered in others. Also, making the identifiers slightly more specific could improve the readers' apprehension of the quote (e.g. for health providers - type of the healthcare institution, for community members – age or role in the household, etc.)

	□ General comment to the *Results* section: considering that this is a qualitative study, authors may want to elaborate more about the main themes, both – pre-defined and emerged in the analysis. These themes could either be made more defined within the three delays, or presented separately. This would allow the reader to follow the authors' reasoning in translating the *Results* into *Discussion*. In its current version, the basis for some conclusions / lines of argument in the *Discussion* section are hard to be traced in the *Results* section. **References** Depending on the specific journal requirements, authors may want to add DOIs of cited publications. Apart from the above mentioned minor comments, the presented study is well conceived; the rationale, objectives and chosen methods are clearly described in the manuscript; results are presented according to the two study objectives. Discussion and conclusion offer a number of practical suggestions and recommendations for improvement of the emergency medical care in Bangladesh which can inform decision-making processes at the national and regional levels of the health sector in Bangladesh. Recommended for publication, with minor changes.

VERSION 1 – AUTHOR RESPONSE

REVIEWER 1

The authors aim to explain factors that take to bad outcomes in medical emergencies using the three delays model. This model was originally applied to study underlying causes of maternal deaths assuming that prompt health care is important to avoid them. It seems reasonable that this model could be applied to any medical emergency where an early intervention is desired. However, it is not very clear in the manuscript that the three delays model is the most suitable to try to understand the factors that influence the outcomes in medical emergencies.

In the abstract they state that the goal of the study is to "apply the three delays model to", but this model is a framework to understand the underlying factors, and not the goal of a study.
- We have revised the sentence to read as: "the objective of this study was to identify delays in emergency medical care seeking and delivery in rural Bangladesh and factors contributing to these delays by using the Three Delays Model as a framework."
Similarly, at the end of the introduction we have removed the statement: "the objective of this study was to apply the three delays model"

In the methodology section
I think it is necessary to describe in more detail how the participants were selected. Why the selected participants were more appropriate for this study? Also, how was the selection of subjects for the interviews? Were all adults?
- We have added a description of the sampling method in the methods section:
"A purposive sampling strategy was used to elicit perspectives from different groups of community members and different types of healthcare providers."

We have also provided more information on recruitment:
"Community members were recruited by local community leaders. They were chosen based on their involvement in community affairs, availability, and willingness to speak openly. Healthcare providers were recruited by CIPRB researchers. As there are limited healthcare providers in each community, we approached all of those who were available and willing to speak to us. All participants were over the age of 18."

How was the guide of the interviews or focus groups constructed? Is it available? In my opinion, that information should be more clear. Were the original guides in English or in the local language? How it was assured that the translation from the original language to English was accurate?
- We have provided the guide as supplementary material and added a description of the development of the guide:
"The guides were developed with the help of the CIPRB researchers using the rapid appraisal approach for community health assessments. The guides were developed in English, translated into Bengali and then back translated."

In the results section
For Delay 1, it is stated that the decision is complex; however it is not clear that there is an actual delay after the occurrence of an emergency. Emergency is a broad topic; some situation may be more evident than others.
- We agree that emergency is a broad topic and that it is not clear that there is an actual delay after the occurrence of an emergency. Our findings showed that the decision to seek care was based on several factors, including perceived severity of illness, proximity, cost and past experiences at health facilities, as well as cultural factors such as female decision making power and role of traditional medicine. Each of these factors could individually or collectively contribute to a delay in deciding to seek care for an emergency condition. We have changed the language in our discussion and conclusion to reflect this:

"In rural Bangladesh, we found that several socio-contextual factors influenced care seeking decisions, which could contribute to delays in the decision to seek care. "

Conclusion: "However, several socio-contextual factors influence care seeking decisions and could contribute to delays in deciding to seek care"

Figure 2 needs more explanation
- Figure 2 explains the care-seeking continuum as described by community member and the factors that influence care seeking, which are discussed under delay 1. We have now referenced it under delay 1:
"Based on these factors, for most community members, a clear hierarchy to care seeking existed (Figure 2)."

Later in the Recommendations to improve emergency care, there is an argument about that the decision of seeking care is also influenced by the perceived expertise of the health providers. This is not considered in that topic (Delay 1).
- In the discussion section, we removed this sentence: "Staffing and resource shortages often hindered the delivery of timely and high quality medical care, thus contributing to delayed decisions to seek care in the future in a negative feedback loop."
Some participants noted lack of confidence in healthcare providers' skills and abilities, but this seemed to influence their decision regarding where to seek care (private hospital vs CHC) rather than whether to seek care. Therefore, we did not interpret perceived expertise of health providers as contributing to delay 1 (decision to seek care). We have noted that past experiences at health facilities influencing care seeking decisions, which could include experiences with poorly trained providers.

In the Discussion section there is information that is not in the results section. For instance it says that "cultural factors underpin health-related decisions ... particularly in younger women"
- We have tried to make this point clearer in the results section:
"Additionally, cultural factors including female decision-making power and role of traditional medicine influenced care seeking decisions. The majority of participants reported that the

decision to seek care was made by the head of the household, who was typically the husband. In some cases, family elders such as mothers-in law made care seeking decisions."

Also in the Limitations and strengths there is information that should be considered in the methods and results section, such as selection of participant and their characteristics.
- We have noted limited generalizability as a limitation:
"Additionally, participants were identified by local community leaders and their views may not be representative of all community members; however, those individuals were sampled based on specific criteria we deemed important for answering the research questions and purposive sampling is a strength of this type of research."

I disagree with the conclusion that "delays … contribute to adverse outcomes from emergency". This is a statement that cannot be concluded from the results.
- We have changed the language to read as: "However, several socio-contextual factors influence care seeking decisions and could contribute to delays in deciding to seek care, while lack of adequate training, and manpower and resource shortages resulted in delays in receiving care at the health facility. Both these factors could contribute to adverse outcomes from emergency medical conditions. "

REVIEWER 2

Were the data collection tools originally developed in Bengali, or developed in English and translated into Bengali? If the latter, was the back translation into English performed? Were the data collection tools pilot-tested prior to the study?

We have added a description of the development of the guides:
"The guides were developed in English, translated into Bengali and then back translated."
The guides were not pilot tested as these were developed for the purpose of a rapid assessment to get an initial assessment of a community.

Authors may want to consider specifying (a) the sampling method here as well (mentioned in the "Strengths and Limitations" section); (b) whether participants for IDIs – healthcare professionals – were also recruited by local community leaders.
- We have added a description of the sampling method in the methods section as well as more information on recruitment:
"A purposive sampling strategy was used to elicit perspectives from different groups of community members and different types of healthcare providers."

"Healthcare providers were recruited by CIPRB researchers. As there are limited healthcare providers in each community, we approached all of those who were available and willing to speak to us."

In case the two data collectors are among the authors, you may want to specify them (initials). If data collectors are not among the authors, you may want to describe how the accuracy of the data analysis has been ensured (e.g. at least one of the authors who analyzed the data - NK and SK - is familiar with the study setting/language, in order to ensure that no important notions had been lost in translation; whether there were any difficulties in translating certain notions/phenomena/practices into English, and how they were addressed, etc.)
- We have added the initials of the authors who were data collectors:
"All FGDs and IDIs were conducted by two local public health field officers from CIPRB (KF and KBU)."

Authors may want to add a short sentence about the duration of FGDs and IDIs.
- We have added this information:
"On average, each interview/focus group lasted 30 minutes."

What defined the number of IDIs? Was is based on the convenience (e.g. no more health professionals were available for interviews), or saturation (data collectors stopped recruiting health professionals when no new relevant knowledge was being obtained)?

- The number of IDIs was limited by the number of healthcare providers available in each community:
"As there are limited healthcare providers in each community, we approached all of those who were available and willing to speak to us."

P.9, Lines 50-51: Authors may want to add the initials of the data analysts here as well.
- The initials of the data analysts have been added:
"Two analysts (NK and SK) independently reviewed the transcripts and jointly developed a codebook, which consisted of some pre-defined themes as well as additional themes that emerged from the data."

P.9, Lines 50-51: The sentence states that the themes were "identified by the data analysts". Considering the semi-structured nature of data collection tools, had the major themes not emerged during the study conception phase when the data collection tools were developed?
- Some broad themes (e.g. availability of transportation, resources at health facilities, decision-making around emergencies) were pre-defined and additional themes emerged from the data. We have clarified this:
"The analysis combined an inductive and deductive approach. Two analysts (NK and SK) independently reviewed the transcripts and jointly developed a codebook, which consisted of some pre-defined themes as well as additional themes that emerged from the data."

Considering that data collection tools for the two study groups covered different themes and had different objectives (P.8, Line 50 – P.9, Line 8), authors must have collected a large body of data that could afford presenting results by two different groups – community members and services providers, - and not only according to the three delays. In the current version, findings under Delay 1 and Delay 2 are based almost exclusively on the responses of community members, while Delay 3 predominantly reports the findings of interviews with service providers. Having the community members' perceptions/experiences of actual delays in receiving care (Delay 3) would offer a more logical completion to this section.
- We have extended the findings from Delay 3 to include experiences of community members:
Additionally, some community members felt that upon reaching hospitals, patients were prioritized based on connections they had with doctors or ability to pay, which resulted in delays in being seen by a healthcare provider and receiving treatment. Community members also felt that shortage of resources such as medications contributed to delays in receiving timely care once they reached the health facility:
"Raigonj hospital has no medicine and Jia medical also has very limited medicine. Last week I go to Jia medical college hospital to visit a patient and it was a very helpless situation."
- Community elder

Alternatively, if available data allow, authors might consider reporting findings from both groups – *service providers and community members* – within the three delays equally.
- Although healthcare providers were also asked questions about care seeking and transportation, community members provided more rich and thick descriptions of the first 2 delays and providers elaborated more on the third delay. Therefore we have presented results accordingly.

P.16, Lines 28-35: The quote feels misplaced. While it raises a critical issue of shortage of female health workers and cultural barriers to accessing care, the quote does not directly support the preceding sentence.
- We have provided another quote that better supports the need expressed for more trained staff:
"We need a full time doctor here for any emergency. In case of any emergency like heart disease, he/she can manage it immediately." – Female community member

General comment to quotes: authors may want to revisit the consistency of identifiers throughout the text. E.g. “Healthcare provider” which is used several times, appears numbered in some instances, and unnumbered in others. Also, making the identifiers slightly more specific could improve the readers’ apprehension of the quote (e.g. for health providers - type of the healthcare institution, for community members – age or role in the household, etc.)
- For each quote, we have indicated the type of healthcare provider or community member

General comment to the *Results* section: considering that this is a qualitative study, authors may want to elaborate more about the main themes, both – pre-defined and emerged in the analysis. These themes could either be made more defined within the three delays, or presented separately. This would allow the reader to follow the authors’ reasoning in translating the *Results* into *Discussion*. In its current version, the basis for some conclusions / lines of argument in the *Discussion* section are hard to be traced in the *Results* section.
- We have made several changes to the results and discussion section to elaborate more on the nuances of the findings and organizing them so that the results section more closely parallels the discussion points.

References
Depending on the specific journal requirements, authors may want to add DOIs of cited publications.
- We have added DOIs to the references.

VERSION 2 – REVIEW

REVIEWER	Monica Pajuelo School of Science and Philosophy Universidad Peruana Cayetano Heredia Peru
REVIEW RETURNED	14-Sep-2020

GENERAL COMMENTS	In my opinion the manuscript is better written now. I only suggest to add a line about who did the translation, to see if it was accurate in both directions. Also the figures have not been attached in this version.

REVIEWER	Jamila Nabieva Heidelberg Institute of Global Health, University Hospital Heidelberg, Germany
REVIEW RETURNED	27-Sep-2020

GENERAL COMMENTS	Thank you very much for sharing the revised manuscript and authors' response letter. In the revised version of the manuscript authors have addressed all the comments by both reviewers, and have accepted most of the proposed changes. Hence, I recommend the manuscript for publication, provided it meets all other journal requirements and expectations.

VERSION 2 – AUTHOR RESPONSE

In my opinion the manuscript is better written now. I only suggest to add a line about who did the translation, to see if it was accurate in both directions. Also the figures have not been attached in this version.

- We have noted that translations of guides and transcripts were done by CIPRB researchers. We did not complete back translation of transcripts in this study but are confident in the accuracy of the translations as they were done by research staff who were fluent in both languages and involved with the study.
- We are not sure why the figures were not viewable as they were visible to us in the proofs. We have uploaded them again.