PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Variation in on-scene time of emergency medical services and the extent of the difference of on-scene time between genders: A retrospective population-based registry study in Riyadh province, Saudi Arabia
AUTHORS	Moafa, H. N.; van Kuijk, Sander; Moukhyer, M. E.; Alqahtani, D. M.; Haak, Harm

VERSION 1 – REVIEW

REVIEWER	Matthew Booker University of Bristol, School of Social and Community Medicine
REVIEW RETURNED	31-May-2021

GENERAL COMMENTS	Thank you for the opportunity to review this manuscript. This study reports the retrospective analysis of EMS 'on-scene' times based on a dispatch registry in the Riyadh province of Saudi Arabia. The authors identify a median on-scene time 3 minutes longer for women than men in medical cases, and no median duration difference in trauma cases. The authors suggest some socio-cultural explanations may exist for this difference, including house design and the structure of the male/female societal differences in Saudi Arabia. It is less clear why these differences would not exist in Trauma patients, although there is the suggestion that the physical design of households means women may be more likely to be positions away from the building's access in medical cases. Whilst there is limited previous study on this phenomena in this setting to my knowledge, it is very difficult to conclude much at all about the implications of this work as it is currently presented. There is no detailed analysis for the clinical reason for the call, no clinical outcome data, no data on clinical interventions performed. It is therefore impossible to conclude if this 3 minutes difference in on-scene time is clinically justified or clinically significant (and whether it is significant in a positive or deleterious way), nor whether it links with ultimate outcomes. For this reason, whilst the analysis appears to have been conduced appropriately for what it reports, there is very little that can be concluded from this paper that is immediately clinically relevant. I feel without this the paper struggles to advance much understanding. If the authors are suggesting that this type of analysis can be helpful in elucidating socio-cultural issues, then it should be framed as such, and the whole paper would perhaps benefit from a more sociological lens as an example of how routine health data can be used to elicit

	society disparity. Even then, some clinical consequences would be helpful. If the authors are suggesting that small differences between genders in the on-scene time is clinically relevant, the paper needs to build a much better case of evidence for why this is clinically important. Having said all that, I do feel this paper could be worked into something with an interesting comment on the data, as the analysis the authors have performed does appear to have been quite well done. I wonder if it needs reframing with a more social sciences narrative and refocussing down that avenue for publication (perhaps to a more socio-culturally focussed journal with interests in gender disparities in global health), or developing with more clinical outcomes data or a bolder case about the clinical implications supported by appropriate data. Minor comments: In places the written English does need some review to bring it up to publication standard. I would suggest a review by a native English speaker to correct some of the pluralisation errors and grammatical errors. A definition of 'high urgent emergency cases' is required. I think the title is misleading - the design does not allow one to conclude that the identified factors induce gender variation. The setting (Saudi Arabia) would be required in the title. Some background is needed to the significance of the the on scene time target of 15 minutes - whilst I accept this is a policy target, what is the justification for this timeframe, or is it entirely arbitrary?

REVIEWER	Peter O'Meara Monash University, Medicine, Nursing and Health Sciences
REVIEW RETURNED	06-Jun-2021

GENERAL COMMENTS	Thank you for the opportunity to review your paper. This is a very interesting topic and this study is a great start to exploring this and related questions. My main suggestions are that you review the abstract as I doubt that you need detailed statistics at this level (the editor will be able to advise on this matter, while in the strengths and limitations, and the introduction you need to review some of the wording to ensure appropriate use of words to match contemporary use of English adjectives. For example, saying 'vast numbers' is not an appropriate way to say large numbers. This is unlikely to take very long to make this adjustment. I will leave the statistics to the experts. Otherwise it is a well presented paper on an important topic.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dr. Matthew Booker, University of Bristol
Comments to the Author:

Comment 1:
Thank you for the opportunity to review this manuscript.

Response:
Thanks for you as well for your time.

Comment 2:
This study reports the retrospective analysis of EMS 'on-scene' times based on a dispatch registry in the Riyadh province of Saudi Arabia. The authors identify a median on-scene time 3 minutes longer for women than men in medical cases, and no median duration difference in trauma cases. The authors suggest some socio-cultural explanations may exist for this difference, including house design and the structure of the male/female societal differences in Saudi Arabia.

Response:
Indeed, we hypothesize that the differences that we have observed may warrant socio-cultural explanations, such as house structure and the involvement of male guardian in the treatment of female patients. As this is not substantiated by any evidence from our study, these suggestions are discussed in the discussion section. Please see pages 15-16, line 394 – 417.

Comment 3:
It is less clear why these differences would not exist in Trauma patients, although there is the suggestion that the physical design of households means women may be more likely to be positions away from the building's access in medical cases.

Response:
Most of trauma cases in Saudi Arabia are road traffic accidents. As the patient would be in the public domain at that point, we do not expect the same mechanisms to come into play as we hypothesized for medical emergencies, that predominantly arise in the home setting. Please see page 15, lines 392 – 394.

Comment 4:
Whilst there is limited previous study on this phenomena in this setting to my knowledge, it is very difficult to conclude much at all about the implications of this work as it is currently presented.

Response:
We agree that there is limited data on this phenomenon. Ours is actually the first study in the middle east to investigate the on-scene time differences for highly urgent patients transported to emergency departments. We think that our study is primarily hypothesis generating, and may result in future studies, whether socio-cultural or medical, that study these phenomena in more depth. Due to the nature of our data, a registry, we were not able to study these phenomena as of yet. We have added another explanation related that could affect to loading time due to Saudi culture differences. Please see page 15, lines 404 – 411. Furthermore, we have added explanations related to the phenomenon from other cultures that resemble Saudi Arabia." Please see page 16, lines 421 – 426. In addition, we discussed factors unrelated to Saudi cultures, such as universal women's behaviour, to access healthcare in general practice and during emergencies. We also explained Saudi women's lower health literacy and the lower demand for EMS and how these might affect the scene time. Please see page 17, lines 436 – 453.

Comment 5:
There is no detailed analysis for the clinical reason for the call, no clinical outcome data, no data on clinical interventions performed. It is therefore impossible to conclude if this 3 minutes difference in on-scene time is clinically justified or clinically significant (and whether it is significant in a positive or deleterious way), nor whether it links with ultimate outcomes. For this reason, whilst the analysis appears to have been conduced appropriately for what it reports, there is very little that can be concluded from this paper that is immediately clinically relevant. I feel without this the paper struggles to advance much understanding.

Response:

We agree, the nature of our data imply that we can only report these differences and suggest possible explanations but cannot provide empirical evidence of those explanations. This was the goal of our study, as these results can be used to generate hypotheses for future studies. As explained earlier, only few studies on EMS quality in our region have been performed. We see ours as a starting point for future research on these differences. Future research could be conducted to determine what causes this difference and might be directed toward the individual-specific reason for calls.
We have added further plausible explanations on the clinical importance and the possible clinical consequence that could occur due to this delay.
Please see pages 18- 19, lines 480 – 496.

Comment 6:
If the authors are suggesting that this type of analysis can be helpful in elucidating socio-cultural issues, then it should be framed as such, and the whole paper would perhaps benefit from a more sociological lens as an example of how routine health data can be used to elicit society disparity. Even then, some clinical consequences would be helpful. If the authors are suggesting that small differences between genders in the on-scene time is clinically relevant, the paper needs to build a much better case of evidence for why this is clinically important.

Response:
We think that elucidating socio-cultural differences could be the next step in unravelling the differences that we report in our study. In our study, we do not have the means to do so.

Comment 7:
Having said all that, I do feel this paper could be worked into something with an interesting comment on the data, as the analysis the authors have performed does appear to have been quite well done. I wonder if it needs reframing with a more social sciences narrative and refocussing down that avenue for publication (perhaps to a more socio-culturally focussed journal with interests in gender disparities in global health), or developing with more clinical outcomes data or a bolder case about the clinical implications supported by appropriate data.

Response:
Please see response numbers 4 and 5

Minor comments:

Comment 1:
In places the written English does need some review to bring it up to publication standard. I would suggest a review by a native English speaker to correct some of the pluralisation errors and grammatical errors.

Response:
Thank you for your suggestion. We have sought a native English speaker who thoroughly reviewed the manuscript and corrected the pluralisation and grammatical errors.

Comment 2:
A definition of 'high urgent emergency cases' is required.

Response:
We have defined the high urgent emergency cases as the following: “According to the Saudi EMS definition, highly urgent emergency cases are the cases that contacted EMS for support after

exposure to serious or life-threatening illness or injuries that require immediate medical intervention and quick transportation to hospital emergency departments (EDs).”.
Please see page 6, lines 216 – 219.

Comment 3:
I think the title is misleading - the design does not allow one to conclude that the identified factors induce gender variation. The setting (Saudi Arabia) would be required in the title.

Response:
We have changed the title, and we added the setting of Saudi Arabia to the title to be as follows: “Variation in on-scene time of emergency medical services and the extent of the difference of on-scene time between genders: A retrospective population-based registry study in Riyadh province, Saudi Arabia”. Please see page 1, lines 1 – 3.

Comment 4:
Some background is needed to the significance of the on-scene time target of 15 minutes - whilst I accept this is a policy target, what is the justification for this timeframe, or is it entirely arbitrary?

Response:
We have added further information in the section of the study setting related to the significance of the on-scene time of 15 minutes identified by Saudi EMS. Please see pages 5-6, lines 182 – 192.

Reviewer: 2

Dr. Peter O'Meara, Monash University
Comments to the Author:

Comment 1:
Thank you for the opportunity to review your paper. This is a very interesting topic and this study is a great start to exploring this and related questions.

Response:
Thank you for your appreciation.

Comment 2:
My main suggestions are that you review the abstract as I doubt that you need detailed statistics at this level (the editor will be able to advise on this matter, while in the strengths and limitations, and the introduction you need to review some of the wording to ensure appropriate use of words to match contemporary use of English adjectives. For example, saying 'vast numbers' is not an appropriate way to say large numbers. This is unlikely to take very long to make this adjustment. I will leave the statistics to the experts. Otherwise it is a well presented paper on an important topic.

Response:
Thank you for your appreciation. We have improved the abstract by reducing unnecessarily detailed statistics. For the language aspects, our manuscript has been reviewed by English-native speakers thoroughly.
Please see the abstract section on pages 2 – 3, lines 41 – 80.

VERSION 2 – REVIEW

REVIEWER	Matthew Booker University of Bristol, School of Social and Community Medicine
REVIEW RETURNED	27-Nov-2021

GENERAL COMMENTS	Thank you for the opportunity to review a revised version of the manuscript. I do believe this has progressed but I feel there are a couple of points to correct before being finally able to support publication: The authors have made some additional insertions to augment the theorising about the small difference in on scene time in high urgency medical cases in women, that is not seen in high urgent trauma cases. In addition, some of the other rebuttals that the authors have provided to my previous comments indicate that they view this paper as hypothesis generating, rather than having the ability to empirically support reasons for differences (author response to comment 5), nor the means to elucidate the socio-cultural reasons for the differences observed (author response to comment 6). They position this paper as the first-of-topic to start to advance the discourse and specifically designed research on the subject. Whilst I do feel the paper now reads more comprehensively about the possible theories and hypothesis about the differences, which

	are welcome additions, there now slightly runs the risk that this is ‘over concluded’. There is quite a mix of these hypotheses alongside the presented data in the results section (with the lack of empirical evidence for these now quite varied and detailed hypotheses, I would have expected to see a clearer delineation between a ‘results’ section, and a discussion/interpretation section – indeed, there appears to be no discrete discussion section at all – this lack of structure between results and discussion/comparison with other literature needs addressing: The additional theorising the authors have included and the linkage with other data about healthcare treatment of women means the blurring of these two sections is a little problematic for me now. Also, there is no real reference in the abstract to the fact that this is a hypothesis generating study about the impact of socio-cultural mechanisms on gender differences in ambulance on scene times – given that the authors argue in their rebuttal that this paper is theory and hypothesis generating for subsequent study, I think the abstract needs to include that ‘purpose’. I appreciate the paper has had a more comprehensive review of the English language – there are still some examples where I feel this could be presented better – some examples below: Line 183 – should this read “scoop and run”? Likewise line 505. Line 464 “linger” with reference to women’s medical consultations – suggest avoid this word, I don’t think it has appropriate connotations.

VERSION 2 – AUTHOR RESPONSE

Reviewer: 1

Dr. Matthew Booker, University of Bristol

Comments to the Author:

Comment 1:

Thank you for the opportunity to review a revised version of the manuscript.

Response: Thank you for your time.

Comment 2:

I do believe this has progressed but I feel there are a couple of points to correct before being finally able to support publication:

The authors have made some additional insertions to augment the theorising about the small difference in on scene time in high urgency medical cases in women, that is not seen in high urgent trauma cases.

Response:

Thank you for your remarks. We have added more information explaining why the difference in the on-scene time was not seen in highly urgent trauma emergencies in the discussion of the manuscript. Please see page 16 – 17, lines 435 – 438.

Comment 3:

In addition, some of the other rebuttals that the authors have provided to my previous comments indicate that they view this paper as hypothesis generating, rather than having the ability to empirically support reasons for differences (author response to comment 5), nor the means to elucidate the socio-cultural reasons for the differences observed (author response to comment 6). They position this paper as the first-of-topic to start to advance the discourse and specifically designed research on the subject.

Whilst I do feel the paper now reads more comprehensively about the possible theories and hypothesis about the differences, which are welcome additions, there now slightly runs the risk that this is 'over concluded'.

Response:

Thank you for these remarks. Since our study is limited due to retrospective use of our database, it is considered hypothesis-generating and not a study elucidating socio-cultural reasons for differences observed or providing proof of the difference found. We think the current version of the discussion in our manuscript overcame running the risk of "over concluded" after the reconstructions that we made for the discussion section. Please see our next response for the reviewer's comment number 4. Importantly, we have added to the aim of our study that we hypothesize for possible factors delaying the on-scene time. Please see page 5, lines 156 – 157. We also added the following sentences "These findings are hypothesis generating and require further studies." to our study conclusion. Please see page 21 lines 537.

Comment 4:

There is quite a mix of these hypotheses alongside the presented data in the results section (with the lack of empirical evidence for these now quite varied and detailed hypotheses, I would have expected to see a clearer delineation between a 'results' section, and a discussion/interpretation section – indeed, there appears to be no discrete discussion section at all – this lack of structure between results and discussion/comparison with other literature needs addressing: The additional theorising the authors have included and the linkage with other data about healthcare treatment of women means the blurring of these two sections is a little problematic for me now.

Response:

Thank you for your remarks. We checked the study's result section, and now there are no discussion sentences there. The discussion has some redundant results to explain further and hypothesize. In the current version, we restructured and adapted the discussion rigorously. We made the following changes:

1- The first two paragraphs of this version elucidate findings of the delay in the on-scene time in general and discuss the consequence of this delay for all patients regardless of sex. We reinserted them from the last two paragraphs of the previously submitted version without adding new insertions. Please see these restructured paragraphs on page 15, lines 388 – 410.

2- The reviewer stated that “The additional theorising the authors have included and the linkage with other data about healthcare treatment of women means the blurring of these two sections is a little problematic for me now”. We agree with the reviewer, and therefore, we have deleted these additional theories about healthcare treatment for women. As a result, the following paragraph was deleted: “During the on-scene period…sirens and lights. 53 54”. Please see page 18 – 19, lines 475 – 488. Besides, the related references of this paragraph were struck through. Please see page 24 – 25, lines 704 – 734.

3- The last five paragraphs of this submitted version have discussed the intergender difference found in Saudi Arabia and hypothesized the possible reason for this delay and recommendation of future studies. These paragraphs are composed of what we had already written in the previously submitted version. We have only added one high-value reference, " Abdul Salam A, Elsegaey I, Khraif R, et al. Population distribution and household conditions in Saudi Arabia: reflections from the 2010 Census. Springerplus 2014;3:530-30. doi: 10.1186/2193-1801-3-530," to a sentence describing the average number of family members per household in Saudi Arabia. Please see these restructured paragraphs on page 15 – 19, lines 411 – 494.

Comment 5:

Also, there is no real reference in the abstract to the fact that this is a hypothesis generating study about the impact of socio-cultural mechanisms on gender differences in ambulance on scene times – given that the authors argue in their rebuttal that this paper is theory and hypothesis generating for subsequent study, I think the abstract needs to include that ‘purpose’.

Response:

Thank you for your remarks. We have included the purpose of hypothesis generating in the abstract objective and conclusion. Please see page 2, line 44 & lines 64 – 65.

Comment 6:

I appreciate the paper has had a more comprehensive review of the English language – there are still some examples where I feel this could be presented better – some examples below:

Line 183 – should this read “scoop and run”? Likewise line 505.

Line 464 “linger” with reference to women’s medical consultations – suggest avoid this word, I don’t think it has appropriate connotations.

Response:

Thank you very much for your appreciation.

- We have changed the “scope and run” into “scoop and run”. Please see page 5, line 184
- We have deleted the paragraph including the word “to linger”. Please see point 2 in our response for comment number 4.
- Furthermore, we also have our copy checked by native English proof-reader.