PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	The impact of family presence during cardiopulmonary resuscitation on team performance and perceived task load: a prospective randomized simulator-based trial
AUTHORS	Willmes, Mareike; Sellmann, Timur; Semmer, Norbert; Tschan, Franziska; Wetzchewald, Dietmar; Schwager, Heidrun; Russo, SG; Marsch, Stephan

VERSION 1 – REVIEW

REVIEWER	Lederman, Zohar Rambam Health Care Campus
REVIEW RETURNED	04-Oct-2021

GENERAL COMMENTS	The manuscript discusses an ever-important topic and is clearly written. The study itself is rigorous well described, and it adds valuable data to the literature overall. I thus recommend it be published. Below are suggestions for minor revisions that I invite the authors to address. 1. “However, available studies cover the range of benefit, no meaningful effects and harm for family witnesses of CPR.” I had to read this sentence 3 times to understand it. I suggest it be modified, particularly because the same phrase appears two lines below. Also, I don’t think this is an accurate description of the literature. All the major studies show that it does benefit relatives. 2. “physicians, mainly residents in their 2nd to 3rd year of postgraduate medical education in internal medicine, anaesthesia or surgery, from Germany and German-speaking countries working in intensive and emergency care” It will be helpful to explain how the German system operates: what does it mean that they work in intensive and emergency care? Does it mean emergency medicine department? Surgical ICU? Who usually performs CPR in Germany? Why should surgeons know anything about CPR other than med school- level and experience?? 3. “Participants were offered to participate in voluntary simulator-based workshops and informed that simulations were video-taped for scientific reasons.” I would invite the authors to address and explain the fact that the participants weren’t trained in family witnessed CPR prior to the study? Why should we except them to perform optimally without prior training? We train them to conduct CPR before testing and observing them, why not do the same with family presence? It is unfortunate that the authors emphasize the negative impact demonstrated in the study- increased emotional burden on staff- going so far as to wonder about the long term effects. The primary

	strategy however to reduce psychological burden is training, and the authors don't even consider it.

REVIEWER	Barreto, Mayckel Universidade Estadual de Maringá
REVIEW RETURNED	07-Oct-2021

GENERAL COMMENTS	Dear authors of the article: "The impact of family presence during cardiopulmonary resuscitation on team performance and perceived task load: a prospective randomized simulator-based trial" is necessary to paraben or group hair great study that will develop by addressing a still emerging and controversial issue in science. The results are relevant, stimulate discussion on the subject and add knowledge to direct the family presence during the CPR exercises. I emphasize that at some point the authors affirm that: an additional temporary burden is associated with an increase in the frustration of perceived temporary and mental demands. From the reading of the text, I understood that the family's own presence is associated with no increase in the temporary load. At least, I don't identify an analysis that associates time-load with NASA. I suggest that you refer to this magazine, affirming that it is not a summary, but the results are in the discussion of the study. No 3rd paragraph gives discussion of the authors contextualizing the question of "distraction" two doctors. Shape how this post draws a negative connotation. Perhaps this "distraction" may be related as a fact that doctors perceive a family presence and also offer them an initial attention (or that is necessary and important). This is true when the family is present for CPR, but there is no presence of a "facilitator" - a professional destined to accompany the family at this time. Hair that I understood between the members of the teams that was not intended to accompany exclusively or family (being or facilitator). This needs to be weighed here in the discussion, because in the absence of the "facilitator" it can lead to this small delay, since the attending doctors will also need to attend to the family of the patient. Finally, not the fourth paragraph to discuss or suggest that the authors begin by saying that: "I have studied with XX profissionais in the CPR situation tested by the family demonstrating that ....." It is portraying the results of the present study. More once parabenzo years authors excellent hair intervention study conducted, from a robust sample of medical professionals.

REVIEWER	Bradley, Carolyn Yale-New Haven Hospital
REVIEW RETURNED	08-Oct-2021

GENERAL COMMENTS	Thank you for the opportunity to review this work.

VERSION 1 – AUTHOR RESPONSE

Reply to Reviewer 1

We authors thank Dr. Zohar Lederman for his constructive and meaningful comments. All his suggestions and criticisms were incorporated in the revised version of the manuscript.

The manuscript discusses an ever-important topic and is clearly written. The study itself is rigorous well described, and it adds valuable data to the literature overall. I thus recommend it be published. Below are suggestions for minor revisions that I invite the authors to address.

Thank you for this nice feedback

1. "However, available studies cover the range of benefit, no meaningful effects and harm for family witnesses of CPR." I had to read this sentence 3 times to understand it. I suggest it be modified, particularly because the same phrase appears two lines below.

Also, I don't think this is an accurate description of the literature. All the major studies show that it does benefit relatives.

We agree with you. The sentence was rephrased in the revised manuscript to both make it better readable and to describe more adequately the current evidence as follows:

In the only randomized trial so far, family members witnessing the resuscitation efforts had significantly less post-traumatic stress disorder-related symptoms. There are however observational studies showing no meaningful effects of family presence or even an increase in post-traumatic stress disorder-related symptoms.

2. "physicians, mainly residents in their 2nd to 3rd year of postgraduate medical education in internal medicine, anaesthesia or surgery, from Germany and German-speaking countries working in intensive and emergency care"

It will be helpful to explain how the German system operates: what does it mean that they work in intensive and emergency care? Does it mean emergency medicine department? Surgical ICU? Who usually performs CPR in Germany? Why should surgeons know anything about CPR other than med school- level and experience??

In the German health system Intensive care medicine is a mandatory rotation within the "common trunk residency" ranging between 6 months (surgery and Internal Medicine) and 12 months (anesthesia). During their rotations residents of intensive care units and emergency departments are the designated 24/7 first responders for all medical emergencies, including CPR; occurring within their hospitals. This information has been added to the revised version of our manuscript.

During their formation to become a surgeon in Germany, residents have to do a rotation in intensive care. During that rotation, the duties from surgical residents do not differ from medical residents

3. "Participants were offered to participate in voluntary simulator-based workshops and informed that simulations were video-taped for scientific reasons." I would invite the authors to address and explain the fact that the participants weren't trained in family witnessed CPR prior to the study? Why should we except them to perform optimally without prior training? We train them to conduct CPR before testing and observing them, why not do the same with family presence?

In Germany, family presence during medical emergencies including CPR is rather rare. In the debriefings, roughly 90% of our participants revealed that at their work places family members are systematically sent out of the room. We are not aware of any systematic teaching program on family presence in Germany though small scale initiatives may exist.

Following your suggestion, we included the following statement in the methods' section of the revised version of the manuscript: No formal training in family witnessed CPR was provided.

4. It is unfortunate that the authors emphasize the negative impact demonstrated in the study- increased emotional burden on staff- going so far as to wonder about the long term effects. The primary strategy however to reduce psychological burden is training, and the authors don't even consider it.

Thank you for mentioning this important topic. We fully agree. In the revised manuscript we addressed this as follows:

Future research is necessary to determine whether training CPR with family presence can reduce or even abolish negative emotions encountered. Moreover, future research should address whether the psychology burden imposed by medical emergencies may have lasting negative effects on health-care workers and/or their future patients

Reply to Reviewer 2

The authors thank Dr. Mayckel Barreto for his constructive and meaningful comments. All his suggestions and criticisms were incorporated in the revised version of the manuscript.

1. I emphasize that at some point the authors affirm that: an additional temporary burden is associated with an increase in the frustration of perceived temporary and mental demands. From the reading of the text, I understood that the family's own presence is associated with no increase in the temporary load. At least, I don't identify an analysis that associates time-load with NASA. I suggest that you refer to this magazine, affirming that it is not a summary, but the results are in the discussion of the study.

Thank you for this comment. We realized through your comment that the wording "additional temporal burden" can be indeed misleading given the very similar scientific expression "temporal demand" used in the NASA task load index.

To avoid confusion we replaced "additional temporal burden" with "additional task" throughout the revised manuscript

2. No 3rd paragraph gives discussion of the authors contextualizing the question of "distraction" two doctors. Shape how this post draws a negative connotation. Perhaps this "distraction" may be related as a fact that doctors perceive a family presence and also offer them an initial attention (or that is necessary and important). This is true when the family is present for CPR, but there is no presence of a "facilitator" - a professional destined to accompany the family at this time. Hair that I understood between the members of the teams that was not intended to accompany exclusively or family (being or facilitator). This needs to be weighed here in the discussion, because in the absence of the "facilitator" it can lead to this small delay, since the attending doctors will also need to attend to the family of the patient.

Thank you to making us aware of the potential negative connotation of "distraction" and your hints towards facilitators.

To account for your concerns we rephrased "initial distraction" with "initially more complex process of within-team task allocation in the absence of a pre-designated person to support the family member".

In addition, we added the absence of a "facilitator" to the limitations' paragraph

3. Finally, not the fourth paragraph to discuss or suggest that the authors begin by saying that: "I have studied with XX profissionais in the CPR situation tested by the family demonstrating that ....." It is portraying the results of the present study.

According to your suggestion we rephrased the first sentence of the discussion as follows: In this prospective randomized simulator-based trial involving 318 resuscitation teams interaction with family members occurred during approximately one quarter of the time available for CPR.

More once parabenzo years authors excellent hair intervention study conducted, from a robust sample of medical professionals.

Thank you for this feedback

VERSION 2 – REVIEW

REVIEWER	Lederman, Zohar Rambam Health Care Campus
REVIEW RETURNED	26-Dec-2021

GENERAL COMMENTS	This is a fine study and the authors have responded to my concerns adequately. I recommend publication, with some minor suggestions for revision 1. “In the only randomized trial so far, family members witnessing the resuscitation efforts had significantly less post-traumatic stress disorder-related symptoms” An inaccurate statement. See: - Compton et al., “Family-Witnessed Resuscitation: Bereavement Outcomes in an Urban Environment,” Journal of Palliative Medicine 14, no. 6 (2011): 715-21. 32. 2. Seemingly based on this reference: Hunziker S, Semmer NK, Tschan F, Schuetz P, Mueller B, Marsch S. Dynamics and association of different acute stress markers with performance during a simulated resuscitation. Resuscitation 2012; 83(5):572-578l, the authors state that that “CPR is a stressful task”. I would be more careful here, as I am not sure the literature supports this assertion and my own personal experience suggests otherwise. Simulations are one thing, but real life is quite another. It’s obviously stressful to perform while being tested, but routine makes real-life practice much more relaxed I think. CPR in my shop, particularly with LUCAS, is actually an opportunity to calmly discuss the differential diagnosis and bond with colleagues. ‘stressful’ doesn’t even come to mind. The authors may of course disagree. 3. “intensive care medicine is a mandatory rotation within the “common trunk residency” of surgery, internal medicine, and anesthesia” this is another limitation of the study. The training seems to be very different from that of emergency medicine residents or the corresponding residents elsewhere. It seems to me there is a world of difference between the EM resident for whom ACLS is bread and butter and the surgery resident, and between the latter and the internal medicine resident. 4. “offering family presence during CPR does not imply weighing the benefits of relatives against the benefits of patients (high-quality CPR) but rather against the psychological well-being of the health-care teams involved. However, temporarily dealing with unpleasant or stressful events is inherent in medical practice.” This

	has been argued by Zohar Lederman in several publications, in case the authors are looking for references.

VERSION 2 – AUTHOR RESPONSE

Reply to Reviewer: 1

The authors thank Dr. Ledermann for his thoughtful review. All criticisms and suggestions were incorporated in the revised version of our manuscript.

Dr. Zohar Lederman, Rambam Health Care Campus Comments to the Author:
This is a fine study and the authors have responded to my concerns adequately. I recommend publication, with some minor suggestions for revision

Thank you

1. "In the only randomized trial so far, family members witnessing the resuscitation efforts had significantly less post-traumatic stress disorder-related symptoms"
An inaccurate statement. See:
- Compton et al., "Family-Witnessed Resuscitation: Bereavement Outcomes in an Urban Environment," Journal of Palliative Medicine 14, no. 6 (2011): 715-21. 32.

Thank you for mentioning this somewhat tricky issue. Compton et al themselves described their study in the methods' section as a "prospective, quasi-experimental, comparison group study". Moreover, in the limitations' section they stated that "Secondly, and most importantly, this was not a randomized study". That is why we had listed this study as observational.
A very brief summary of the available evidence in the original version of the manuscript was, according to the reviewer, difficult to understand. In the revised version of the manuscript, we have modified the description of evidence as follows:

*In the **largest** randomized trial conducted so far family members witnessing the resuscitation efforts had significantly less post-traumatic stress disorder-related symptoms. [8;9] **However, a prospective comparison group study reported no impact of witnessing CPR on bereavement related depression and PTSD symptoms** [10] while observational studies showed no meaningful effects of family presence [11] or even an increase in post-traumatic stress disorder-related symptoms. [12;13]*

2. Seemingly based on this reference: Hunziker S, Semmer NK, Tschan F, Schuetz P, Mueller B, Marsch S. Dynamics and association of different acute stress markers with performance during a simulated resuscitation. Resuscitation 2012; 83(5):572-578l, the authors state that that "CPR is a stressful task".
I would be more careful here, as I am not sure the literature supports this assertion and my own personal experience suggests otherwise. Simulations are one thing, but real life is quite another. It's obviously stressful to perform while being tested, but routine makes real-life practice much more relaxed I think. CPR in my shop, particularly with LUCAS, is actually an opportunity to calmly discuss the differential diagnosis and bond with colleagues. 'stressful' doesn't even come to mind. The authors may of course disagree.

*We agree with the reviewer that stress levels can depend on routine and settings. However, we routinely used a questionnaire in many of our previous simulator-based studies asking participants about their stress levels felt during simulation and stress levels felt during real cardiac arrests. Findings were consistent in that simulated cardiac arrests appear to provoke significantly **less** stress than real arrests. We published these data once in Hunziker et al BMC Emergency Medicine 2009, **9**:3 :*

"The median participants' ratings were 9 (Inter-quartilerange [IQR] 8 – 10) for the realism of the scenario, 8 (IQR 8 – 10) for the realism of their own behaviour, 8 (IQR 7 – 10) for the realism of the behaviour of their colleagues, 7 (IQR 5 – 10) for the quality of their team's performance, ***6 (IQR 4 – 10) for the stress felt during simulation, and 9 (IQR 7 – 10; p < 0.0001 vs. stress during simulation) for the stress felt during a real cardiac arrest."***

In the revised version of the manuscript, we modified the beginning of the sentence to "CPR is a demanding and often stressful task" and added the above reference (reference 14 of the revised version) to support our statement.

3. "intensive care medicine is a mandatory rotation within the "common trunk residency" of surgery, internal medicine, and anesthesia" this is another limitation of the study. The training seems to be very different from that of emergency medicine residents or the corresponding residents elsewhere. It seems to me there is a world of difference between the EM resident for whom ACLS is bread and butter and the surgery resident, and between the latter and the internal medicine resident.

According to your suggestion, the following sentence was added to the limitations' section:
Moreover, findings may not generalize to teams with more formalized CPR training and more frequent exposure like in emergency medicine.

4. "offering family presence during CPR does not imply weighing the benefits of relatives against the benefits of patients (high-quality CPR) but rather against the psychological well-being of the health-care teams involved. However, temporarily dealing with unpleasant or stressful events is inherent in medical practice." This has been argued by Zohar Lederman in several publications, in case the authors are looking for references.

Thank you for making us aware of this work. We added the following 2 referrences to the paragraph addressed by the reviewer:

- *Lederman Z, Garasic M, Piperberg M. Family presence during cardiopulmonary resuscitation: who should decide? J Med Ethics 2014; 40(5):315.*

- *Vincent C, Lederman Z. Family presence during resuscitation: extending ethical norms from paediatrics to adults. J Med Ethics 2017; 43(10):676.*