PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Reactions and coping strategies in lay rescuers who have provided CPR to out-of-hospital cardiac arrest victims: a qualitative study
AUTHORS	Mathiesen, Wenche Torunn; Bjørshol, Conrad; Braut, Geir Sverre; Soreide, Eldar

VERSION 1 - REVIEW

REVIEWER	Hideo Inaba Department of Emergency Medical Science, Kanazawa University School of Medicine
REVIEW RETURNED	01-Dec-2015

GENERAL COMMENTS	It is certain that how lay rescuers experience OHCA is rarely investigated. In this interview study for bystanders, most of whom provided CPR, authors showed that reactions after providing CPR may cause serious and persistent concerns in lay rescuers and that experiencing a positive patient outcome and being a health-educated lay rescuer seems to mitigate reactions. However, how bystanders who did not provide CPR react is unclear in this study, Furthermore, whether the effort to minimize the reaction would increase the rate of bystander CPR remains to be clarified. Also, it is unclear whether this study was approved by any Ethical Committee. The other issues to be considered in the revision process are as follows: #1. Number of rescuers interviewed is too small. How the authors avoid the selection bias is unclear in Methods. It is unusual that majority of bystanders interviewed had CPR training experience. #2. The time from experiencing the OHCA incident to participating in the interview widely ranged. However, the effect of this duration on bystander's reaction is not analysed due to the small numbers. #3 The authors reported that the most of lay rescuers were not informed about the outcome in the region where this study was conducted. In Japan and other countries, it is usual that bystanders who provided CPR are informed about the good outcome and commended by fire departments. #4. I understand that this is one of very few studies to explore the reactions and coping strategies of lay rescuers following CPR provision for OHCA victims. However, I have seen many case reports (many are reported in other languages than English) regarding this issue. I failed to find new or more qualified approach to this issue. #5 Obtaining assurance regarding lay person's skill is also important strategy to increase the rate of bystander CPR.

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REVIEWER	Athanasios Chalkias National and Kapodistrian University of Athens, Medical School, MSc “Cardiopulmonary Resuscitation”, Athens, Greece
REVIEW RETURNED	15-Dec-2015

GENERAL COMMENTS	The authors must be commended for investigating this extremely important topic. Reactions and coping strategies in lay rescuers who have provided CPR should be further investigated. Lay rescuers need "emotional resuscitation" following CPR provision and this study can serve as one of the first steps towards the establishment of this intervention.

REVIEWER	Åsa Axelsson Institute of Health and Care Sciences Sahlgrenska Academy University of Gothenburg Sweden
REVIEW RETURNED	23-Dec-2015

GENERAL COMMENTS	Thank you for the opportunity to review this interesting study in a research area where knowledge is lacking. I think this paper can ad knowledge to the topic but I would like to se the paper strengthened as described bellow. Abstract: Should be re-written when the manuscript is revised. Methods: There are a lot of different approaches, methods and references mentioned in the methods part that makes the reading very confusing. It is impossible to find out what method the analysis is grounded in. You mention phenomenology and give references to phenomenography (which is quite different in the approach). Further you write you used a phenomenological, thematic approach to content analysis, without giving any references to such a method or approach. The structure of fig. 1 is not logical to me. You usually go from meaning units to sub-categories, to categories and maybe to a theme. Please, decide what method/approach you want to use for your study and stick to it. It makes it much easier to validate the trustworthiness of your study. It does not improve your manuscript to have many different method references. Results: I am sure that you have a rich material that is worth publishing but to do so you need to enhance your analysis. This comment is strongly associated with my concerns about the method. I would advise you to re-analyze, and if needed take help from someone that is familiar with qualitative analysis. It is always useful to take in others in the process of analyzing to make it more both creative and trustworthy. As the result is now, it is a lot of interesting things in it but I think you with a little help can make it even more interesting. Taking the theme Communication for example, the meaning units from participant 4, 5 and 7 says much more than the theme communication. And that the category “coping strategy” end up in the theme communication (is it is like that you have thought), does that mean that communication was the only coping strategy used. I could be interesting to put this in relation to theory about coping strategy. As it is now you do not

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	seem to have thought about if there is any theoretical frame to discuss your results against. Table 1: This could preferably be in the method part. But there are different meanings about this. However, I would like to have a table that not so clearly point out the informants, especially when you to this have quotes that are directly related to the participant. In such a small community that the study comes from it can be hard to keep the confidentiality of the participants. Instead you can present how many men and females, median/mean age and so on. I also would like to see the median/mean time and range for time from CPR to interview. Table 2-4: This type of table is usually used in the method part to show an example of how the analysis has been done. You make a richer narrative of your result if you wove in the quotations in the text and structure the describing of the result out from the analysis. As if the theme/category is “concern” you build that part up from the each of the sub-categories. Further, make sure that sub-categories are at approximately the same level. Feeling of guilt and Psychological reactions are not, as you easily can say that feeling of guilt is a psychological reaction. That makes psychological reaction at a higher abstract level as it can absorb feeling of guilt. This is just a reminder for your re-analysis. Limitations: The impact of the variation in time from CPR to interview could be more discussed. To summarize: I think this is an important study that addresses an important problem. With increasing bystander CPR rates the responsibility of the society to take care of the bystanders reactions increase. This is a research area that is very sparse explored, which makes it even more important. However, the paper needs to be more accurate in method and analysis, if so I think you will have even more interesting results. I would be happy to review the paper again and really hope that you can strengthen this important paper.

REVIEWER	Carolina Malta Hansen Copenhagen University Hospital Herlev and Gentofte, Denmark Duke Clinical Research Institute, USA
REVIEW RETURNED	06-Jan-2016

GENERAL COMMENTS	This is a well-written and important paper assessing a difficult field with significant knowledge gaps. I have included some comments I hope the authors consider for further improving the manuscript. Minor comments: Please explain line 45-50. Generally, people who take action have a better psychological response to an event. So in this case, the hypothesis should be people who perform CPR should feel better than those who witness but do not intervene. Line 20: How was the interview guide constructed? Was prior knowledge/theory used and was the guide refined as interviews were conducted? It would be helpful if the authors could include a copy of the final interview guide. Results Table 1. Please elaborate on the column ‘Relation between lay

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	rescuer and OHCA victim'. What does related mean? Family or spouse? And what does known mean? That they had met previously, were friends, acquaintances? Please add this information. Major comments: Results Line 50: 'Nightmares, flashbacks and intrusive images of the cardiac arrest victim persisted'. Persisted for how long? It's well-established people have an acute reaction following such an event, which is part of a coping strategy. But it is important to distinguish between acute reactions and long-lasting reactions which could be symptoms of trauma. The same goes for 'Unwanted weight reduction, anxiety, insomnia and temporary sick leave were…' How long did these symptoms last and how were anxiety and insomnia diagnosed? Please explain what unfortunate impacts on work and family life mean. Page 12: Coping strategies. This section could be elaborated. In the first paragraph the authors described bystanders talked with family and friends. The next paragraph seems to describe bystanders' unmet needs. This could be a separate section, as it was not a coping strategy, but rather something bystanders wish they had in order to better cope with the incident. It is important to make this distinction as - also discussed by the authors – there is growing evidence bystanders might need a formal follow-up which might be considered by public health authorities. It would also be helpful if the authors could add any information about whether EMS personnel provided any kind of feedback at the scene and how this was received by the participants. Discussion Line 46: Please add patient age, gender and prior comorbidity. Page 14, first paragraph: a discussion of population selection in the different studies and how this might affect their reactions is very relevant. Please add to this discussion whether the selection method for including bystanders in the present study might have identified a sample with more negative reactions than others. Given the participants were willing to meet and discuss the event, up to 13 years after the occurrence could suggest they were still in need of clarification. Others who had coped well with the incident might have been less prone to participate in the study. Please discuss the fact that 10 out of 18 bystanders knew/were related to the person who suffered the arrest. Thus, their reactions might not only reflect how they coped with providing CPR but mostly likely also reflect a reaction to the whole experience of witnessing a loved one suffer a cardiac arrest/die. This is important as public health authorities cannot prevent such a reactions, which would also be expected to be normal. But it is important to assess how public health authorities could facilitate coping related to CPR provision. Page 14/15: The authors could consider discussing the importance of informing potential and past bystanders that patient outcome is dependent on a number of factors and that bystander intervention cannot cause harm but only improve chance of survival. Thus, bystanders should be informed patient outcome should not be viewed as a measure of bystander performance. The authors could discuss the possibility of including such information in future CPR courses, CPR awareness campaigns, bystander websites, hotlines or flyers distributed by EMS. Also, as the number of bystanders increase, public health authorities could consider establishing bystander support groups where bystanders would be able to connect with others and thus discuss their experiences. It would be helpful if the authors included a discussion of

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	how/whether the participants' coping strategies helped cope with the experience. Møller et al. reported bystanders mostly spoke with family and friends and this seemed to sufficient for them to cope with the experience. Limitations: Please add the significant range in time from incident to interview and discuss how this could have affected the findings in the context of coping. One week is usually considered normal for an acute reaction. As the median time was 9 years, how can this have affected the results? Conclusion: Please consider removing 'We think' from line 27.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Question 1: However, how bystanders who did not provide CPR react is unclear in this study.
Response: This is a highly interesting question for research which we hope we will attend to later. The present study of lay rescuers who have provided CPR to out-of-hospital cardiac arrest (OHCA) victims do not explore the reactions of bystanders who did not provide CPR.
Question 2: Whether the effort to minimize the reaction would increase the rate of bystander CPR remains to be clarified.
Response: It is difficult to predict if and how an effort to minimize reactions after providing CPR will increase bystander rate. However, the authors believe that such efforts will enhance mutual trust between health authorities and community citizens.
Question 3: Also, it is unclear whether this study was approved by any Ethical Committee.
Response: The study was approved by the Institutional Review Board in Stavanger Hospital Trust, Norway and will be stated so under the headline: Ethics approval
Question 4: Number of rescuers interviewed is too small. How the authors avoid the selection bias is unclear in Methods. It is unusual that majority of bystanders interviewed had CPR training experience.
Response: According to Morse, estimating the number of participants in a study depends on a number of factors, including the quality of data, the scope of the study, the nature of the topic, the amount of useful information obtained from each participant and the number of interviews per participant, and the qualitative method and study design used.1 In this study, we interviewed 20 bystanders who provided CPR, a number which we regarded as sufficient for collecting information about the experiences by lay rescuers who have provided CPR to OHCA victims .1
As stated under the headline data collection and sampling, to avoid selection bias we used different strategies for including participants. However we agree with reviewer 1, we did not entirely succeed. As in most of the resuscitations in this study, the cardiac arrest victims survived, which does not reflect the survival rate in our area. To minimize the selection bias, we therefor did not include several bystanders with surviving cardiac victim in the study.
In Norway, there is ongoing national and local focus on layperson CPR training.2 Thus, a trained majority of participants in this study does not surprise the authors, especially when experience of CPR training closely associated with willingness to attempt CPR.3
Question 5: The time from experiencing the OHCA incident to participating in the interview widely ranged. However, the effect of this duration on bystander's reaction is not analysed due to the small numbers.
Response: We agree. This limitation is stated in the study. A validated instrument for measuring reactions after providing CPR is more applicable to identify the effect of time on reaction after providing CPR than our explorative study. We have added views on this matter in limitation part.
Reviewer: 3
Question 1: Abstract: Should be re-written when the manuscript is revised.
Response: We agree. We have rewritten the abstract in accordance with the changes in the

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manuscript.
Question 2: Methods: There are a lot of different approaches, methods and references mentioned in the methods part that makes the reading very confusing. It is impossible to find out what method the analysis is grounded in. You mention phenomenology and give references to phenomenography (which is quite different in the approach). Further you write you used a phenomenological, thematic approach to content analysis, without giving any references to such a method or approach.
Response: The reviewer is very accurate in correcting our mistake about confusing the concepts of phenomenology and phenomenography. As we in this study are not particularly concerned by any of the terms, we have in the revised manuscript and avoided them both.
Question 3: The structure of fig. 1 is not logical to me. You usually go from meaning units to sub-categories, to categories and maybe to a theme.
Please, decide what method/approach you want to use for your study and stick to it. It makes it much easier to validate the trustworthiness of your study. It does not improve your manuscript to have many different method references.
Response: This advice has been most helpful. We have altered the structure of the study. As Figure 1 in the original manuscript does not add any value to the understanding of the analysis process in the study, we have removed it and replaced it with a more logical table (Table 2) according to the new structure. We have removed references which are redundant in the revised edition of the manuscript.
Question 4: Results: I am sure that you have a rich material that is worth publishing but to do so you need to enhance your analysis. This comment is strongly associated with my concerns about the method. I would advise you to re-analyze, and if needed take help from someone that is familiar with qualitative analysis. It is always useful to take in others in the process of analyzing to make it more both creative and trustworthy.
As the result is now, it is a lot of interesting things in it but I think you with a little help can make it even more interesting. Taking the theme Communication for example, the meaning units from participant 4, 5 and 7 says much more than the theme communication. And that the category "coping strategy" end up in the theme communication (is it is like that you have thought), does that mean that communication was the only coping strategy used. I could be interesting to put this in relation to theory about coping strategy. As it is now you do not seem to have thought about if there is any theoretical frame to discuss your results against.
Response: We are very grateful for this comment as we believe it has enhanced the manuscript considerably. We have consulted an expert in the field of qualitative method and restructured the findings which we hope are presented in a more logical and interesting way.
Question 5: Table 1: This could preferably be in the method part. But there are different meanings about this. However, I would like to have a table that not so clearly point out the informants, especially when you to this have quotes that are directly related to the participant. In such a small community that the study comes from it can be hard to keep the confidentiality of the participants.
Instead you can present how many men and females, median/mean age and so on. I also would like to see the median/mean time and range for time from CPR to interview.
Response: We have followed the reviewer's advice to move Table 1 to the method part. However, we do not see the potential threat to participant confidentiality, as the participants experienced the OHCA on different locations in Norway, though primarily with lay rescuers from the Stavanger region. Norway is populated with 5 million inhabitants, and we regard the probability for recognizing participants is negligible. Still, we have altered the approximated age of the cardiac arrest victim in Table 1 to the closest number of 5 to strengthen the anonymity of the bystanders. Also, the range for time from CPR to interview is added to the table as the reviewer suggested.
Question 6: Table 2-4: This type of table is usually used in the method part to show an example of how the analysis has been done. You make a richer narrative of your result if you wove in the quotations in the text and structure the describing of the result out from the analysis. As if the theme/category is "concern" you build that part up from the each of the sub-categories.
Response: We agree with the reviewer and have removed the tables to weave quotations into the text.

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Question 7: Further, make sure that sub-categories are at approximately the same level. Feeling of guilt and Psychological reactions are not, as you easily can say that feeling of guilt is a psychological reaction. That makes psychological reaction at a higher abstract level as it can absorb feeling of guilt. This is just a reminder for your re-analysis.
Response: This is a most appropriate comment from the reviewer. We have corrected this and believe we now have sub-categories at approximately the same level.
Limitations: The impact of the variation in time from CPR to interview could be more discussed.
Response: We have attended this comment in the manuscript.
Reviewer: 4
Question 1: Please explain line 45-50. Generally, people who take action have a better psychological response to an event. So in this case, the hypothesis should be people who perform CPR should feel better than those who witness but do not intervene.
Response: The reviewer raises a very interesting question about the underlying hypothesis raised in the introduction part of the study. The reviewer states that, generally, people who take action have a better psychological response to an event. Unfortunately, we are not acquainted with this knowledge. However, a brief search in scientific literature show that psychological responses after taken action may be more complexed and in accordance with our underlying hypothesis. Landman referrers to the studies of Kahneman and Tversky (1982 a) who found that most people do imagine experiencing more regrets for outcomes attained via actions than via inaction.4
Question 2: Line 20: How was the interview guide constructed? Was prior knowledge/theory used and was the guide refined as interviews were conducted? It would be helpful if the authors could include a copy of the final interview guide.
Response: As this was an explorative study, we based the questions in what we believed would meet the experiences of the lay rescuers inspired by the rater sparse scientific literature on the topic. The original interview guide was followed through the entire study, but we increasingly emphasized the questions directed towards the reactions after the OHCA more than to technical details in the incident. We have added this point in the manuscript. We also were inspired of principles for debriefing (ref) when the constructing the interview guide. We will enclose a translated copy of the interview guide as supplementary information.
Question 3: Results. Table 1. Please elaborate on the column ‘Relation between lay rescuer and OHCA victim’. What does related mean? Family or spouse? And what does known mean? That they had met previously, were friends, acquaintances? Please add this information.
Response: We agree to the reviewer’s comments on how relation to the OHCA victim is presented in the manuscript. We have added an elaborated this point in the manuscript under the headline “results”.
Question 4: Results.Line 50: ‘Nightmares, flashbacks and intrusive images of the cardiac arrest victim persisted’. Persisted for how long? It’s well-established people have an acute reaction following such an event, which is part of a coping strategy. But it is important to distinguish between acute reactions and long-lasting reactions which could be symptoms of trauma. The same goes for ‘Unwanted weight reduction, anxiety, insomnia and temporary sick leave were…’ How long did these symptoms last and how were anxiety and insomnia diagnosed? Please explain what unfortunate impacts on work and family life mean.
Response: The reviewer most appropriate points out that the duration of the reactions after providing CPR should be distinguished to identify potential sickness. Further she states that it is well-established that people have an acute reaction following such an event, which is part of a coping strategy. In the design of this study we wanted to avoid quantifying in example; unwanted weight reduction, anxiety, insomnia and temporary sick leave because this would be more of a quantitative study which also would require the use of a validated instrument for studying. Quantifying this reactions would also inevitable be related to assessing whether the reactions were pathological or not. Other research designs will be more suitable to assess this matter. In this study, we chose a qualitative research method because we do not possess the explicit knowledge needed to design a relevant questionnaire for a quantitative study. This is why we wanted to explore the subject of

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providing CPR and leaves more the duration of reactions to further studies. Also, the time span from CPR provision to interview varied greatly amongst the interviews. This means that details about how long symptoms lasted could be inaccurate reported. Thus, we have limited the design to the qualitative method which implies avoiding controversial use of numbers.
Question 5: Page 12: Coping strategies. This section could be elaborated. In the first paragraph the authors described bystanders talked with family and friends. The next paragraph seems to describe bystanders' unmet needs. This could be a separate section, as it was not a coping strategy, but rather something bystanders wish they had in order to better cope with the incident. It is important to make this distinction as - also discussed by the authors – there is growing evidence bystanders might need a formal follow-up which might be considered by public health authorities. It would also be helpful if the authors could add any information about whether EMS personnel provided any kind of feedback at the scene and how this was received by the participants.
Response: We agree to the authors comments. However, the reason for organizing "the need for acknowledgement and assurance regarding the adequate performance of CPR" in the category: "Coping strategies" was both on the bystanders' initiatives but also what they experienced to be valuable coping strategies, but not offered to them. This creates a duality and nuances the statements. We have restructured the findings. Hopefully the reviewer will find the revised edition of the manuscript improved on this matter. The bystanders reported sometimes feedback from the EMS personnel provided on scene. However, this kind of feedback to bystanders are not organized is in our EMS system. We will add this information in the manuscript.
Question 6: Discussion. Line 46: Please add patient age, gender and prior comorbidity.
Response: We have added the suggested comment in the manuscript.
Question 7: Page 14, first paragraph: a discussion of population selection in the different studies and how this might affect their reactions is very relevant. Please add to this discussion whether the selection method for including bystanders in the present study might have identified a sample with more negative reactions than others. Given the participants were willing to meet and discuss the event, up to 13 years after the occurrence could suggest they were still in need of clarification. Others who had coped well with the incident might have been less prone to participate in the study.
Response: We agree and have added the suggested comment in the manuscript.
Question 8: Please discuss the fact that 10 out of 18 bystanders knew/were related to the person who suffered the arrest. Thus, their reactions might not only reflect how they coped with providing CPR but mostly likely also reflect a reaction to the whole experience of witnessing a loved one suffer a cardiac arrest/die. This is important as public health authorities cannot prevent such a reactions, which would also be expected to be normal. But it is important to assess how public health authorities could facilitate coping related to CPR provision.
Response: We agree to the authors comment and added the suggested comment. However, knowing or being related to the cardiac arrest victim means having access to information about the patient outcome. We experienced in this study that the uncertainty about the outcome of the cardiac arrest victim was hard to overcome which was mostly expressed by the bystanders without any relation to the cardiac arrest victim. This may be emotional burdens which to date have been unnoticed by public health authorities.
Question9: Page 14/15: The authors could consider discussing the importance of informing potential and past bystanders that patient outcome is dependent on a number of factors and that bystander intervention cannot cause harm but only improve chance of survival. Thus, bystanders should be informed patient outcome should not be viewed as a measure of bystander performance. The authors could discuss the possibility of including such information in future CPR courses, CPR awareness campaigns, bystander websites, hotlines or flyers distributed by EMS. Also, as the number of bystanders increase, public health authorities could consider establishing bystander support groups where bystanders would be able to connect with others and thus discuss their experiences.
Response: The authors comment on information to bystanders is an important topic. However, we find that this topic is outside the scope of the study, though we strongly agree in the reviewer's opinion. Also, we are very careful to advise how the support by public health authorities should be

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established as we do not know what service will be most beneficial. This decision must be taken in close cooperation with experts in fields within debriefing after traumatic incidents.
Question 10: It would be helpful if the authors included a discussion of how/whether the participants' coping strategies helped cope with the experience. Møller et al. reported bystanders mostly spoke with family and friends and this seemed to sufficient for them to cope with the experience.
Response: The authors of this study wanted to emphasize that the several lay rescuers failed to succeed in their coping strategies they had at hand. We noted that both a lack of debriefing and fatal patient outcome were factors associated with a negative OHCA experience. Also, the lay rescuers established a causal relationship between the CPR provided and the outcome and felt guilty when the effort failed. We believe these matters cannot be sufficient taken care of in communication by family and friends. Still, the explicit importance of communicating to family and friends after providing CPR is missing in the manuscript. We have added a comment to comply with this.
Question 11: Limitations: Please add the significant range in time from incident to interview and discuss how this could have affected the findings in the context of coping. One week is usually considered normal for an acute reaction. As the median time was 9 years, how can this have affected the results?
Response: We are sorry to say that we have noted the median time from the cardiac arrest incident to interview as 9 years. The reason for our mistake was an exclusion of one interview (no CPR provided, only assisting the EMS by showing way) without correcting the value. Still, the reviewer comment is important. We add the range in time from incident to interview in the manuscript.
Question 12: Conclusion: Please consider removing 'We think' from line 27.
Response: We agree and have removed the phrase.

VERSION 2 – REVIEW

REVIEWER	Åsa Axelsson gothenburg university, sweden
REVIEW RETURNED	21-Feb-2016

GENERAL COMMENTS	I think this is an important study that addresses an important problem which is very sparse explored. I can see that there had been a major revision done to the paper, as was asked for. However, it is still difficult to evaluate the trustworthiness. See comments below. Abstract: Aim: A variation of words are used when you present what you are aiming to do; p 5 line 11 – study, p 5 line 30 – discovering, p 7 line 31 – elicit. If your objective is to study the reactions and coping strategies you should use an observational design for your study. Further, commonly the aim states what you are supposed to achieve with the study instead of what you intend to do. Methods: (Line refers to the numbering in the left margin.) P 5 line 23; who are we that not possess the knowledge? P5 line 32; I think meaning not is the best word to use, perhaps experiences is more suitable. Data collection and sampling: The sampling is more accurately described in COREQ question 13. Why using references when describing your intentions or what you actually did? The sample size is sufficient with regard to the qualitative design. P 6 line 12; according to COREQ the flyers only resulted in one

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	participant, which should be presented in the manuscript too. Further, it is more useful to describe what you did than describing what you intended to do. P 6 line 33-36; it would be useful to know how the investigators decided who would provide the best perspective on the phenomenon. It is very clearly described in COREQ. P7 line 12; this is a reiteration from p 6. Data analysis: The analysis process is insufficiently described which makes it difficult to evaluate the trustworthiness of the study. Was your analysis inductive or deductive? Did you analyze manifest or latent content? Further the analysis process is described differently in the discussion part. P 8 line 30; to extract meaning units into codes seems deductive. Please describe how these codes were found. P 8 line 31-35; the definition of a code is not in agreement with the reference. P 8 line 38-42; for the trustworthiness of the study a more transparent description of how you got the three most numerous codes and why you choose them for the analysis is needed. Table 2: Are the codes presented in the table all codes you found or are they examples? Explain how feeling alone and deserted can be categorized as Self-criticism and proudness and how performing everyday activities can be categorized as processing the OHCA incident. With regard to the codes Reactions to patient outcome seems to be a more adequate sub-category than receiving information about patient outcome. It would be useful if you can strengthen the connection between data and the result. Results: It is not possible to follow results presented in text. The result should be systematically reported and structured in accordance with the category-tree, as in Table 2. It is not possible evaluate the results as it is described now. Discussion: The discussion is interesting, but difficult to evaluate when the results are unclear. P 14 line 10; please give a reference about factors influencing CA outcome. P15 line 3-15; this is new results that is not presented in the results part. P15 line 36; please insert a reference about most OHCA die. P 16 line30; It is stated that being a CPR provider does not imply the need for professional treatment. Is this a conclusion or your study or known from previous research, if so, you should have a reference. Limitations: The large variation of time from CPR intervention to interview is a weakness in this study and should be discussed as such. P 17 line 32; I question why a single strategy for recruiting informants should not be of value in qualitative studies. In content analysis it is very common. P17 line 37; I do not question that it is a strength to have a variation within the sample, but you should explain why it is a strength. A discussion about the weaknesses and strengths of the analysis, the researchers preunderstanding and its impact on the analysis is lacking.

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REVIEWER	Carolina Malta Hansen Copenhagen University Hospital Herlev and Gentofte Duke Clinical Research Institute
REVIEW RETURNED	08-Feb-2016

GENERAL COMMENTS	The revisions have significantly improved the manuscript. Please consider revising the term 'lay rescuer' which seems to be used interchangeably. 1. Please define 'lay rescuer' as used in your study. Was lay rescuer used for all who provided CPR off-duty, including physicians and EMS personnel? Please consider adding this to the abstract. 2. Please include education/profession in Table 1 (if health care provider, which type? Physician, nurse, EMS personnel etc). One of the main findings is that 'health educated' coped differently, so please provide their background. 3. Please note, as the authors mention in the discussion section, that in the study by Zijlstra et. al. 42% were off-duty professional rescuers. I would therefore definitely not classify these as lay rescuers and revise the introduction accordingly. It seems as though the population in the present study differs significantly in that regard. Please consider making this more explicit in the introduction and the discussion sections. 4. Please consider including the interview guide in the main manuscript instead of a supplemental table. 5. As I suggested in the prior review, it still seems relevant to distinguish between acute and long-lasting bystander reactions. It is expected that all bystanders experience acute reactions but unfortunate if bystanders generally experience long-lasting reactions. This is particularly relevant to the aspect of whether or not a structured, professional follow-up is needed. Moeller et. al. have shown most bystanders coped by themselves. A sentence or two about whether reactions were mostly present for a week or months would be help the reader understand the magnitude of the reaction in the population of the present study.

VERSION 2 – AUTHOR RESPONSE

Reviewer 3:
Question 1:
Abstract:
Aim:
A variation of words are used when you present what you are aiming to do; p 5 line 11 – study, p 5 line 30 – discovering, p 7 line 31 – elicit.
If your objective is to study the reactions and coping strategies you should use an observational design for your study.
Further, commonly the aim states what you are supposed to achieve with the study instead of what you intend to do.
Response: The reviewer has a very appropriate comment. We have replaced the variant wordings with “explore” and “explorative study”. In this way we hope to avoid confusion and hopefully, we comply better with the new wording (explore) related to achievement rather to intention. We have rephrased the aim.
Question 2:
Methods:

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(Line refers to the numbering in the left margin.) P 5 line 23; who are we that not possess the knowledge?
Response: We have rephrased the wording to: “In this study, we chose a qualitative research method which is suitable for explorative studies.”
Question 3:
P5 line 32; I think meaning not is the best word to use, perhaps experiences is more suitable.
Response: We have rephrased according to the suggested word.
Question 4:
Data collection and sampling: The sampling is more accurately described in COREQ question 13. Why using references when describing your intentions or what you actually did?
Response:
To describe more accurately the data collection and sampling part, we have inserted most of the description from the COREQ question 13.
We used references because we experienced great hurdles in including informants in the study and we wanted to ensure the inclusion method with good scientific practice. However, we have followed the reviewer’s advice to not use references in describing our intentions and what we really did.
Question 5:
P 6 line 12; according to COREQ the flyers only resulted in one participant, which should be presented in the manuscript too.
Response: We have added this point in the manuscript.
Question 6:
P 6 line 33-36; it would be useful to know how the investigators decided who would provide the best perspective on the phenomenon. It is very clearly described in COREQ.
Response: We have added this point in the manuscript.
Question 7:
P7 line 12; this is a reiteration from p 6.
Response: We have withdrawn text in accordance with the recommendation by the reviewer.
Question 8:
Data analysis: The analysis process is insufficiently described which makes it difficult to evaluate the trustworthiness of the study. Was your analysis inductive or deductive? Did you analyze manifest or latent content? Further the analysis process is described differently in the discussion part.
This was an inductive analysis. We have added this in the manuscript. We analyzed manifest content, though we have not explicitly stated this in the text, but newly noted as: “While endeavoring to stay close to the text…”.
Question 9:
P 8 line 30; to extract meaning units into codes seems deductive. Please describe how these codes were found.
Response: The reviewer is correct about what seems to be a deductive strategy for analysis. The study is inductive. Unfortunately, we have been unclear about the developing of codes from the extracted meaning units. This has been corrected in the manuscript. Also, in improving this manuscript, we have chosen to increase examples of codes presented.
Question 10:
P 8 line 31-35; the definition of a code is not in agreement with the reference.
Response: We have corrected this mistake.
Question 11:
P 8 line 38-42; for the trustworthiness of the study a more transparent description of how you got the three most numerous codes and why you choose them for the analysis is needed.
Response: Though it is controversial to use quantitative data in qualitative research studies, it is valued by some if the counting are distinguished and categorized (Maxwell, 2010). In the current study, we wanted to explore reactions and coping strategies in lay rescuers who have provided CPR to out-of-hospital cardiac arrest victims, including how they experienced their CPR, their CPR-training, and talking to the EMS-personnel and more. However, it very soon became clear to the researchers

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of this study that the most important issues for the lay rescuers were the first mentioned subjects. We realized this, after having described the cardiac arrest incident, that most lay rescuers repeatedly turned the answers to life after the OHCA incident more than experiences in the actual incident, even when we asked for something else. In addition, the data material was very rich. Thus, we had the choice of having a broad perspective on being a lay rescuer or narrowing the perspective and perhaps gain a deeper insight in what the lay rescuers mostly focused on.
In addition, we may have used qualitative research terminology inaccurately, which may have contributed to why the reviewer wanted a more transparent description of the analysis.
Indeed, we see the reviewer's point. Thus, we have added comments to increase the transparency and precision.
Question 12:
Table 2:
Are the codes presented in the table all codes you found or are they examples?
Response: They are examples of codes, which we now have pointed out in the first paragraph of the Results section.
Question 13:
Explain how feeling alone and deserted can be categorized as Self-criticism and proudness and how performing everyday activities can be categorized as processing the OHCA incident.
Response: Feeling alone and deserted categorized as self-criticism and proudness: We realize that this code is more appropriate in the sub-category "Bodily and emotional influence", and have changed the placing of the code according to that.
Performing everyday activities categorized as processing the OHCA incident: Performing everyday activities seemed to bring some sort of normality back to the lay rescuers. We address this activity as a way, amongst other strategies, to process the OHCA incident.
Question 14:
With regard to the codes Reactions to patient outcome seems to be a more adequate sub-category than receiving information about patient outcome. It would be useful if you can strengthen the connection between data and the result.
Response: The reviewer's comment is interesting. However, in this study we emphasize the findings about information, and how the information or lack of it, affects the lay rescuers. On this background we choose, after considerations, to keep the wording as in the manuscript, but to improve the meaning slightly by altering the wording in one of the other sub-categories.
Question 15:
Results:
It is not possible to follow results presented in text. The result should be systematically reported and structured in accordance with the category-tree, as in Table 2. It is not possible evaluate the results as it is described now.
Response: We have tried to include, in a structured way, all the codes presented in table 2 in the results section.
Question 16:
Discussion:
The discussion is interesting, but difficult to evaluate when the results are unclear.
Response: When having improved the results section, we hopefully have influenced the discussion part in a beneficial way. Also; we discuss the relationship between the OHCA-experience and the feeling of coping. We hope that this has improved the manuscript.
Question 17:
P 14 line 10; please give a reference about factors influencing CA outcome.
Response: We have entered references about factors influencing CA outcome.
Question 18:
P15 line 3-15; this is new results that is not presented in the results part.
Response: We have inserted a citation in the result part which hopefully will improve the discussion.
Question 19:

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P15 line 36; please insert a reference about most OHCA die.
Response: We have inserted a reference as requested.
Question 20:
P 16 line30; It is stated that being a CPR provider does not imply the need for professional treatment. Is this a conclusion or your study or known from previous research, if so, you should have a reference.
Response: The authors of this study wanted to avoid claiming all lay rescuers in need for treatment by health professionals. As we have written in the manuscript, a validated research instrument in a new study is required to state to what extent lay rescuers need follow-up. However, the statement pointed out by the reviewer is created by the authors of this study and the phrasing does not entirely reflect our conclusion. Thus, a nuancing is required. We have done so.
Question 21:
Limitations:
The large variation of time from CPR intervention to interview is a weakness in this study and should be discussed as such.
Response: We have added the requested point in the limitation section.
Question 22:
P 17 line 32; I question why a single strategy for recruiting informants should not be of value in qualitative studies. In content analysis it is very common.
Response: We realize that the statement is unclear when referred to in the manuscript. Therefore, it is replaced by a statement more suitable to this context.
Question 23:
P17 line 37; I do not question that it is a strength to have a variation within the sample, but you should explain why it is a strength.
Response: We have added this point in the “limitation” section.
Question 24:
A discussion about the weaknesses and strengths of the analysis, the researchers preunderstanding and its impact on the analysis is lacking.
Response: We have added our understanding of the researchers preunderstanding in the “limitation” section.
Reviewer: 4
Question 25:
Please consider revising the term 'lay rescuer' which seems to be used interchangeably.
Please define 'lay rescuer' as used in your study. Was lay rescuer used for all who provided CPR off-duty, including physicians and EMS personnel? Please consider adding this to the abstract.
Response: We have corrected this by ensuring using the term “lay rescuers” rather than “rescuer” or “bystander” in all the text concerning our study. When referring to other articles, we have used the original term used.
Unfortunately, there is no uniform term about individuals who provide CPR. In this study, we wanted to avoid the term “bystander”, because it does not imply that the individual has provided CPR, but only been present at the OHCA incident. Therefore: We have thoroughly discussed what term to use and concluded with “lay rescuer”. Also, we realize we have not explicitly defined the term “lay rescuer” which we now have corrected.
Question 26:
Please include education/profession in Table 1 (if health care provider, which type? Physician, nurse, EMS personnel etc). One of the main findings is that 'health educated' coped differently, so please provide their background.
Response: To ensure the participants anonymity, we are reluctant to include education/profession in the table. However, we have been more explicit about the educations in the “Data collection and sampling” section.
Question 27:
Please note, as the authors mention in the discussion section, that in the study by Zijlstra et. al. 42%

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were off-duty professional rescuers. I would therefore definitely not classify these as lay rescuers and revise the introduction accordingly. It seems as though the population in the present study differs significantly in that regard. Please consider making this more explicit in the introduction and the discussion sections.
Response: We fully agree with the reviewer. The term used by CPR providers in the study by Zilstra is "lay rescuer", and this is the reason for the choice of wording in the introduction section. Please note the answer in question 23 for more details.
Question 28:
Please consider including the interview guide in the main manuscript instead of a supplemental table.
Response: After all the valuable comments by the reviewers, the manuscript have improved significantly, but also become voluminous. We have thoroughly discussed the suggestion about including the interview guide in the manuscript, but have concluded this to be an unnecessary addition to the volume as long as the interview guide is to be found as supplementary material. If the Editor still thinks this should be done we will of course be happy to include the interview guide in the main manuscript.
Question 29:
As I suggested in the prior review, it still seems relevant to distinguish between acute and long-lasting bystander reactions. It is expected that all bystanders experience acute reactions but unfortunate if bystanders generally experience long-lasting reactions. This is particularly relevant to the aspect of whether or not a structured, professional follow-up is needed. Moeller et. al. have shown most bystanders coped by themselves. A sentence or two about whether reactions were mostly present for a week or months would be help the reader understand the magnitude of the reaction in the population of the present study.
Response: We have been reluctant to report about how long the reactions lasted because the study was not designed to identify this, nor did we add a question about this subject in the interview guide. We realize now that we should have been more explicit about how long the reactions lasted. However, this study was inductive and more designed to identify the reactions as such, more than focusing on how long the reactions lasted. However, some participants stated the duration on their own initiative and in general terms as "weeks" and "days" or "long time". On these grounds, we add: "and could vary in time from days to months" in the manuscript in the Concern section.

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. [Review]. Nurse Educ Today, 24(2), 105-112. doi: 10.1016/j.nedt.2003.10.001
Maxwell, J. A. (2010). Using numbers in qualitative research. Qualitative Inquiry, 16(6), 475-482.

VERSION 3 - REVIEW

REVIEWER	Åsa Axelsson Gothenburg university Sweden
REVIEW RETURNED	13-Apr-2016

GENERAL COMMENTS	I find the revision of the manuscript very satisfying and the response to my questions too. The manuscript is well written and well structured and add new and significant knowledge in an research area that are rather unexplored. I recommend publishing. Best regards

REVIEWER	Carolina Malta Hansen Duke Clinical Research Institute

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	USA
REVIEW RETURNED	29-Apr-2016

GENERAL COMMENTS	The reviewer completed the checklist but made no further comments.

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