PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	A comparison of simulation debriefs with traditional needs assessment methods: A qualitative exploratory study in a critical care community setting
AUTHORS	Sarti, Aimee J.; Ajjawi, R; Sutherland, Stephanie; Landriault, Angele; Kim, John; Cardinal, Pierre

VERSION 1 – REVIEW

REVIEWER	Alexander Garden Department of Anaesthesia, Wellington Regional Hospital, Wellington, New Zealand
REVIEW RETURNED	10-Dec-2017

GENERAL COMMENTS	I found your paper difficult to follow. It would have been easier to read if it had been much more concise. e.g. "Simulations were conducted at the community hospital to obtain data on human and social capital at the community hospital, including interdisciplinary team functioning, crisis resource management and critical care knowledge and skills." Doesn't really contribute much. I think that it is unsurprising that the debriefs didn't elicit information about end of life care, given that the scenarios didn't address end of life care. I think that there is already a reasonable body of literature on simulation being used to identify system gaps in particular, and so I think that you will struggle to argue that this paper adds to the literature in a meaningful way.

REVIEWER	Vijayanand Jamalpuri Rainbow Children's Hospital, Hyderabad, India
REVIEW RETURNED	01-Feb-2018

GENERAL COMMENTS	Innovative method of needs assessment by simulation methodology. Need more emphasis on the limitations of the debriefing following simulation exercise. The participants may not disclose or reflect fully if debriefing environment is not facilitative. So results can be variable due to different debriefing skills of the facilitators. However, one would expect facilitators to be well trained and expected to know their objectives for each simulation scenario.

REVIEWER	Patrick Lavoie Postdoctoral fellow, William F. Connell School of Nursing, Boston College, USA
REVIEW RETURNED	08-Feb-2018

GENERAL COMMENTS	Thank you for the opportunity to review this manuscript, which presents a comparative analysis of three approaches to collect qualitative data for a needs assessment: manikin-based simulation

	debriefings, virtual patient simulation debriefings, and interviews (individual and focus groups). I believe this is an interesting topic that deserves attention. I think the manuscript needs to present a more detailed conceptual definition of needs assessment for the reader to understand the contribution of each approach to this kind of exercise. Plus, the comparison between approaches is mostly based on the topics addressed in each approach, without discussion of the variations in the validity and trustworthiness of the findings drawn from each modality. Accordingly, a comparison of the cost and time required for each modality would be more eloquent if the comparability of the findings was argued more extensively, especially considering criteria for validity and trustworthiness of qualitative research findings. Given the arguments put forward in the manuscript, I wonder if the approaches are superior or complementary to each other. Introduction: The authors argue that simulation followed by debriefing could be used to conduct needs assessments. However, definitions of "needs assessment", "simulation", or "debriefing" should be provided. It is unclear how the original study used simulation in combination with interviews and focus groups to assess needs related to the care of critically ill patients in a community setting. I believe more explanation regarding the needs that were assessed in the original study would be helpful in that regard. The distinction between simulation for needs assessment and simulation as a pedagogical tool needs to be clarified, especially since the manuscript mentions that debrief sessions were included as "normal pedagogical practice […] to facilitate development of reflective skills for simulation participants." (p. 4) The argument that the same themes were discussed in the debriefings and in the larger needs assessment is interesting and deserves attention. Aim: I believe the aim of the study should be clarified. What exactly is meant by "potential"? Plus, the aim mentions that "system, team and individual needs" were explored in the needs assessment. This merits further definition and explanation in the introduction. Maybe defining clear research questions could help the reader understand this study's purpose? Methods: Even though the study is presented as a secondary analysis, the manuscript should include a description of participants and setting. The authors refer to another manuscript to explain the original study data collection and analysis, but more details are needed in the current manuscript. The sequence of the virtual and manikin-based simulations needs to be clarified. Was there one debriefing after both forms of simulation? The data that were collected in the simulations could also be described further and linked to the purpose of the needs assessment. What was the method used for debriefing? What were the questions asked to the participants? What topics were explored? The 'time and cost analysis' section presents the data that were collected regarding time and cost for each approach. However, the methods used to analyze and compare these data should be detailed. The costs are presented globally, but it would be interesting to consider what was achieved in terms of the quality of the findings for each approach.

	The 'secondary data analysis' does not present sufficient information on the methods used to compare themes found in the original NA with themes founds in the debriefings. Plus, there is no discussion of the criteria used to compare the two approaches. Results: It appears that simulations only included participants from the community setting, whereas the focus groups and interviews also included other categories of stakeholders. Accordingly, it seems unsurprising that the theme 'patient post-referral hospital' was not found in the debriefings. Moreover, it seems that the comparison is made between over 30 interviews and only 12 debriefings, which raises the question of the volume and validity of the data. This is partly addressed by the authors when they mention that "more descriptive data was discovered with the earlier NA versus the simulation debriefs" (p. 11). However, I wish there would have been further comparisons regarding the difference in the quality of the data collected with each approach in the manuscript. It is unclear how the themes that were identified in the simulations, but not in the interview/focus groups, contributed to the needs assessment, as these themes seem to relate to the nature (fidelity) and pedagogical aspect (teaching and promoting reflection, interruption to provide teaching) of simulation. Accordingly, it appears logical that these themes would not be found in interviews without a pedagogical purpose. From my own reading, it seems that these themes were interpreted as revealing system gaps (rapidity of receiving blood work, need for a 24/24h RT and educational needs related to Swan-Ganz catheters). I find myself wondering if these themes actually contributed to the needs assessment, or if they are more reflective of the mechanisms by which needs were discovered in the debriefings. Additionally, from my perspective, the themes described in the manuscript appear more as categories than themes. From my understanding, themes should provide sufficient details to understand what was addressed in the data and how it was addressed. For example, 'need to increase knowledge on mechanical ventilation' is a theme that would fit in the category 'knowledge'. The information presented in Table 3 is partially supported by the data and the results section. For instance, how did the 'skill level of the facilitator' was determined for each approach? Some information in this table appears to be based on experience or impressions; this table could probably be presented in the discussion section. Discussion: The discussion begins with a statement that debriefings may be more efficient than interview and focus groups to capture similar needs during a needs assessment. I find this statement insufficiently supported by the results. The comparison is made on the basis of costs and time for each approach. However, there is no discussion of the validity of the findings from each data collection approach. While the authors seem to have conducted more interviews and less simulation, there is no evidence to support the idea that both approach yielded similar results, beyond the fact that the same topics were addressed. The depth and content of the themes seems to have differed between the approaches. Plus, the simulations did not include the perspective of stakeholders outside the community hospital, which seems like a significant limit. I believe the criteria used for comparison should be defined more

	clearly and the validity and trustworthiness of the findings should be discussed, especially from a qualitative standpoint. Statements such as: "a greater depth of data was captured through the more traditional methods" (p. 17) clearly exemplify this point and renders the saying that one approach was more efficient than the other rather dubious. Finally, I would like to highlight the tension between the purpose of the data collection approaches, the level of control over the topics addressed, and the findings that each approach yielded. For example, the authors explain that some themes were not found in the simulations but were found in the interviews. They mention that: "The simulation cases were not specifically designed to explore the areas of end-of-life care or the interaction between the community and referral hospital, contrasted to the traditional NA which undertook a broad line of inquiry along with probing into various aspects of critical care, including both end-of-life care and inter-hospital interactions" (p. 17). This made me wonder if using only simulations in a needs assessment might focus participants' attention towards certain issues and needs relevant to the scenario. I am worried that this could compromise the comprehensiveness and validity of the needs assessment exercise. Overall, I believe that the idea examined in this paper deserves to be pursued and I strongly encourage the authors to continue their reflection.

REVIEWER	Fabian Stroben Department of Anesthesiology and Operative Intensive Care Medicine at Campus Benjamin Franklin, Charité-Universitätsmedizin Berlin, Germany
REVIEW RETURNED	25-Feb-2018

GENERAL COMMENTS	Thank you very much for your subscription which highlights simulation for needs assessment. I agree with your central finding that Simulation is a very potent tool for uncovering needs of participants while learning and performing skills. Your article is well structured and carefully limits its message regarding the multiple roles an instructor has during debriefing with simultaneous fostering a needs assessment and give feedback after simulation. Nevertheless, there are two methodological questions I would like to see adressed in a revised submission: a) Are the interview/focus group-participants from community hospital the same as the 13 participants who attended in the simulations? This might be a limitation due to the fact, that the same participants express same needs independent of the method (simulation vs. focus group). If yes, this should be addressed in the discussion or the methods section. b) I also struggle with your cost comparison and your conclusion that HFS and VPS is more cost-effective than focus groups. I calculated costs/participant and also costs/minute transcript and in both calculations, simulation is more expensive than interviews/focus groups. In my opinion, your conclusion that simulation ist the most cost-effective way of a needs assessemnt should be more catious discussed regarding these calculation. Though, more participants/more transcript does not mean more insight in any case. Furthermore I would be interested in further studies adressing the

	question if instructors after simulation are capable of deriving information for needs assessment based on their experience or/and based on checklists as the TEAM or other ratings tools and if these information are equal to participants' needs. You mentioned to have rated your groups with these instruments but no results are presented in your manuscript. Can you explain why? I look forward to read a revised manuscript and will be excited to see your article published in this journal.

REVIEWER	Sandra Johnston Queensland University of Technology, Australia
REVIEW RETURNED	25-Feb-2018

GENERAL COMMENTS	At the end of the document it is stated that ethical approval was from the Ottawa The abstract does not describe who the needs assessment is based at Needs assessment needs to be define up front for the reader Hospital Research Ethics Board. However, a suggestion is this should be mentioned in the manuscript with any other ethical considerations. References are old and reference #16 Creswell is incomplete. Simulation is an area of much research and more up to date literature is available The secondary aim of comparing time and costs might be feasible but using simulation to elicit what is needed is going to give very different results from an interview. The simulation would be very focused on a specific condition where as this is not available for the community setting. If the same scenario is discussed with the community group, this needs explanation as it is not clear

VERSION 1 – AUTHOR RESPONSE

Responses to reviewers:

Reviewer: 1
Reviewer Name: Alexander Garden
Institution and Country: Department of Anaesthesia, Wellington Regional Hospital, Wellington, New Zealand
Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below:
I found your paper difficult to follow. It would have been easier to read if it had been much more concise. e.g. "Simulations were conducted at the community hospital to obtain data on human and social capital at the community hospital, including interdisciplinary team functioning, crisis resource management and critical care knowledge and skills." Doesn't really contribute much. I think that it is unsurprising that the debriefs didn't elicit information about end of life care, given that the scenarios didn't address end of life care.

Our Response:

Thank you for agreeing to review our manuscript. You have provided excellent feedback and we have now revised the manuscript so as to delete the extraneous information in referencing the original needs assessment paper.

I think that there is already a reasonable body of literature on simulation being used to identify system gaps in particular, and so I think that you will struggle to argue that this paper adds to the literature in a meaningful way.

Our Response:

We agree that there is a reasonable amount of literature on simulation being used to identify system gaps, however the real purpose of our study was to compare three (manikin-based simulation debriefings, virtual patient simulation debriefings, and interview / individual and focus groups), approaches to collect qualitative data in conducting needs assessments. What adds to the literature on using simulation to identify, among other things, system gaps is that simulation is a very potent tool for uncovering needs of participants while simultaneously learning and performing skills in a needs assessment context.

Reviewer: 2
Reviewer Name: Vijayanand Jamalpuri
Institution and Country: Rainbow Children's Hospital, Hyderabad, India
Please state any competing interests or state 'None declared': Medical Education; Point of Care Ultra Sound; Quality Improvement; Simulation Based Learning

Please leave your comments for the authors below
Innovative method of needs assessment by simulation methodology. Need more emphasis on the limitations of the debriefing following simulation exercise. The participants may not disclose or reflect fully if debriefing environment is not facilitative. So, results can be variable due to different debriefing skills of the facilitators. However, one would expect facilitators to be well trained and expected to know their objectives for each simulation scenario.

Our Response:

Thank you for highlighting the innovative approach to performing needs assessments and the important aspect of the debriefing process. We agree that participants may be reluctant to put forth information if the environment is not "facilitative" and we have noted this in the section "trade offs" (fifth paragraph).

Reviewer: 3
Reviewer Name: Patrick Lavoie
Institution and Country: Postdoctoral fellow, William F. Connell School of Nursing, Boston College, USA
Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below
Thank you for the opportunity to review this manuscript, which presents a comparative analysis of three approaches to collect qualitative data for a needs assessment: manikin-based simulation debriefings, virtual patient simulation debriefings, and interviews (individual and focus groups). I believe this is an interesting topic that deserves attention. I think the manuscript needs to present a more detailed conceptual definition of needs assessment for the reader to understand the contribution of each approach to this kind of exercise.

Our Response:

Thank you for your thoughtful and careful review of our manuscript. We have now provided a more detailed definition of needs assessment in the introduction section.

Plus, the comparison between approaches is mostly based on the topics addressed in each approach, without discussion of the variations in the validity and trustworthiness of the findings drawn from each modality. Accordingly, a comparison of the cost and time required for each modality would be more eloquent if the comparability of the findings was argued more extensively, especially considering criteria for validity and trustworthiness of qualitative research findings. Given the arguments put forward in the manuscript, I wonder if the approaches are superior or complementary to each other.

Our Response:

Thank you for your important comments. We were remiss in adding a “Study Rigour” section to the manuscript and this has now been addressed. We agree that additional information may be beneficial to the reader in terms of comparing the cost and time required for each modality, however we attempted to balance our discussion to include comparisons of the resultant data from each modality as well. We agree that further research in this domain (especially cost and time comparisons) is necessary to enable more definitive judgements.

Introduction: The authors argue that simulation followed by debriefing could be used to conduct needs assessments. However, definitions of "needs assessment", "simulation", or "debriefing" should be provided.

Our Response:

Thanks for picking up on these points. For clarity, we have added more detailed definitions of needs assessment, simulation and debriefing within the introduction.

It is unclear how the original study used simulation in combination with interviews and focus groups to assess needs related to the care of critically ill patients in a community setting. I believe more explanation regarding the needs that were assessed in the original study would be helpful in that regard.

Our Response:

As mentioned in the manuscript, the original needs assessment focused on uncovering system, organizational and individual needs. Thus, we employed multiple data collection strategies to get at needs at the various levels. We feel that we have adequately described the needs from the original needs assessment study. However, we would be happy to add further explanation with more direction (i.e., what kind of explanation of the need that were assessed? Methodologically? Analytically?). Thank you.

The distinction between simulation for needs assessment and simulation as a pedagogical tool needs to be clarified, especially since the manuscript mentions that debrief sessions were included as "normal pedagogical practice […] to facilitate development of reflective skills for simulation

participants." (p. 4) The argument that the same themes were discussed in the debriefings and in the larger needs assessment is interesting and deserves attention.

Our Response:

Thank you for encouraging us to further reflect on the importance of simulation used for needs assessment as well as for learning. We do not take the stance that simulation is distinct from needs assessment and used as a pedagogical tool. Rather, we have found that simulation can be an effective and practical needs assessment approach while at the same time simulation is important in that it can promote learning (or as you note a pedagogical tool).

Aim: I believe the aim of the study should be clarified. What exactly is meant by "potential"? Plus, the aim mentions that "system, team and individual needs" were explored in the needs assessment. This merits further definition and explanation in the introduction. Maybe defining clear research questions could help the reader understand this study's purpose?

Our Response:

Thank you for asking us to provide more details. We use the word “potential” to mean possibility to develop into something that has utility. We note that the central purpose of the original needs assessment was to explore system, team and individual needs at the community hospital. While this is important contextual information it is not central to the current study and feel that interested readers can access the original paper if so inclined. The guiding research questions for this study include:

1. How do the needs identified through simulation compare with those identified using traditional methods of NA data collection?
2. Can similar data be captured more efficiently in the simulation debrief session compared to lengthier traditional methods?
3. What are the strengths and limitations of utilizing simulation in NA?

The research questions have now been added to the manuscript (see section – original study data collection and analysis).

Methods: Even though the study is presented as a secondary analysis, the manuscript should include a description of participants and setting.

Our Response:

Thank you for your comment. However, under the results section the first sub header is ‘participants’ which contains the information on the total number of participants by site. Also, Table 1 contains additional information on participant demographics.

The authors refer to another manuscript to explain the original study data collection and analysis, but more details are needed in the current manuscript.

Our Response:

Thank you for your comment. We agree, more information is needed regarding the data collection and analysis for the original needs assessment. This information has now been added to the manuscript.

The sequence of the virtual and manikin-based simulations needs to be clarified. Was there one debriefing after both forms of simulation? The data that were collected in the simulations could also be described further and linked to the purpose of the needs assessment. What was the method used for debriefing? What were the questions asked to the participants? What topics were explored?

Our Response:

Again, we appreciate your careful read of our paper and agree that your questions should have been addressed. The sequence of the virtual and manikin-based simulations both entailed participants taking part in the respective scenarios then immediately taking part in a debrief session with an expert facilitator. To be clear, a debriefing occurred after both forms of simulation. The method used for debriefing included an expert facilitator utilizing a script to engage participants in a reflective and focused discussion on the particular scenario. As well, the debrief included providing participants information in the form of direct feedback and/or teaching.

Perhaps we should note that these simulation scenarios were originally developed for use with residents and critical care fellows in Canada, with the Acute Critical Events Simulation (ACES) course. The scenarios include cases of impending respiratory failure, shock, severe sepsis and arrhythmias. Additionally, we had these scenarios reviewed by an interdisciplinary panel of experts at the Royal College of Physicians and Surgeons of Canada (RCPSC) and were modified to reflect the realities of practice in the community hospital.

The 'time and cost analysis' section presents the data that were collected regarding time and cost for each approach. However, the methods used to analyze and compare these data should be detailed. The costs are presented globally, but it would be interesting to consider what was achieved in terms of the quality of the findings for each approach.

Our Response:

You pose an interesting question for further reflection. As time and cost were a part of this project, we do plan to investigate the ‘time and cost’ aspect in subsequent studies and we will ensure to take your concerns regarding quality into consideration.

The 'secondary data analysis' does not present sufficient information on the methods used to compare themes found in the original NA with themes founds in the debriefings. Plus, there is no discussion of the criteria used to compare the two approaches.

Our Response:

Thank you. Based on one of your earlier comments (see above), we have now added additional information on the original NA (e.g., data collection and analysis), and hence have given more information regarding the analytical technique used to compare the themes found in the debriefings.

Results: It appears that simulations only included participants from the community setting, whereas the focus groups and interviews also included other categories of stakeholders. Accordingly, it seems unsurprising that the theme 'patient post-referral hospital' was not found in the debriefings. Moreover, it seems that the comparison is made between over 30 interviews and only 12 debriefings, which raises the question of the volume and validity of the data. This is partly addressed by the authors when they mention that "more descriptive data was discovered with the earlier NA versus the

simulation debriefs" (p. 11). However, I wish there would have been further comparisons regarding the difference in the quality of the data collected with each approach in the manuscript.

Our Response:

Thank you, you have raised an important point. A limitation to the study has now been added in that in the simulations included only community hospital participants. However, the interviews/focus groups included both referral and community hospital participants. Given this was an exploratory study, it would be important for further studies to include both stakeholder groups.

It is unclear how the themes that were identified in the simulations, but not in the interview/focus groups, contributed to the needs assessment, as these themes seem to relate to the nature (fidelity) and pedagogical aspect (teaching and promoting reflection, interruption to provide teaching) of simulation. Accordingly, it appears logical that these themes would not be found in interviews without a pedagogical purpose. From my own reading, it seems that these themes were interpreted as revealing system gaps (rapidity of receiving blood work, need for a 24/24h RT and educational needs related to Swan-Ganz catheters). I find myself wondering if these themes actually contributed to the needs assessment, or if they are more reflective of the mechanisms by which needs were discovered in the debriefings.

Our Response:

Thank you for your comments. In particular, the original NA's purpose, in part, was to uncover system gaps whereas the central aim of the current study is to understand if a needs assessment approach utilizing qualitative data from manikin-based simulation and virtual-patient simulation debriefing sessions compares to traditional methods. However, with the current study, we also sought to understand the strengths and limitations of utilizing simulation in NA. Hence, additional themes emerged. We have added the research questions (as noted above) to assist in clarifying this point.

Additionally, from my perspective, the themes described in the manuscript appear more as categories than themes. From my understanding, themes should provide sufficient details to understand what was addressed in the data and how it was addressed. For example, 'need to increase knowledge on mechanical ventilation' is a theme that would fit in the category 'knowledge'.

Our Response:

Our approach to inductive qualitative analysis is to begin from the 'bottom up'. That is, we apply codes to verbatim transcripts, next we assign various related codes to categories, and finally produce descriptive themes. Undeniably, there exist differing methods to achieve rigorous qualitative analysis.

The information presented in Table 3 is partially supported by the data and the results section. For instance, how did the 'skill level of the facilitator' was determined for each approach? Some information in this table appears to be based on experience or impressions; this table could probably be presented in the discussion section.

Our Response:

Thank you. You raise another interesting point. As with all descriptions of past events, some information will need to be taken at face value and this description aligns in that the skill level of the

facilitator is certainly based on our extensive knowledge of the facilitators involved in the project. Of course, having the facilitator(s) identity be revealed would compromise our REB.

Discussion: The discussion begins with a statement that debriefings may be more efficient than interview and focus groups to capture similar needs during a needs assessment. I find this statement insufficiently supported by the results. The comparison is made on the basis of costs and time for each approach. However, there is no discussion of the validity of the findings from each data collection approach. While the authors seem to have conducted more interviews and less simulation, there is no evidence to support the idea that both approach yielded similar results, beyond the fact that the same topics were addressed. The depth and content of the themes seems to have differed between the approaches. Plus, the simulations did not include the perspective of stakeholders outside the community hospital, which seems like a significant limit.

Our Response:

Thank you for raising this issue by we respectfully disagree. We feel strongly that the initial statement in the discussion (as you note above) is supported by the data. Comparisons were made beyond time and cost to include all the interview/focus group and simulation debrief data. Multiple strategies were employed to minimize threats to the validity/credibility of the study. Efforts were made to search for disconfirming evidence through the use of purposive sampling, with the selection of participants to provide a balanced representation of the collective group, including potential differences of opinion. Two forms of triangulation were employed to achieve a balanced perspective and enhance the reliability of the conclusions: 1) data source triangulation (using multiple data sources and informants), and 2) investigator triangulation (using more than one person to collect, analyze and interpret data). In addition, we agree (as noted in response to one of your earlier comments) that not involving stakeholders outside of the community hospital is a limitation and we have noted this within the manuscript.

I believe the criteria used for comparison should be defined more clearly and the validity and trustworthiness of the findings should be discussed, especially from a qualitative standpoint. Statements such as: "a greater depth of data was captured through the more traditional methods" (p. 17) clearly exemplify this point and renders the saying that one approach was more efficient than the other rather dubious.

Our Response:

Thank you for raising this important point. We agree that we were remiss in adequately addressing the validity and trustworthiness of our qualitative findings. As noted to address one of your earlier comments, we have added a study rigour section. To clarify, when we say, “a greater depth of data” we mean that, a) as expected more data was provided, and b) that data was more descriptive in nature than the debrief data.

Finally, I would like to highlight the tension between the purpose of the data collection approaches, the level of control over the topics addressed, and the findings that each approach yielded. For example, the authors explain that some themes were not found in the simulations but were found in the interviews. They mention that: "The simulation cases were not specifically designed to explore the areas of end-of-life care or the interaction between the community and referral hospital, contrasted to the traditional NA which undertook a broad line of inquiry along with probing into various aspects of critical care, including both end-of-life care and inter-hospital interactions" (p. 17). This made me wonder if using only simulations in a needs assessment might focus participants' attention towards certain issues and needs relevant to the scenario. I am worried that this could compromise the comprehensiveness and validity of the needs assessment exercise.

Our Response:

You raise an important issue worthy of ongoing reflection and research. We think that issues of comprehensiveness and validity are discussed upfront when scoping a project alongside budget and feasibility issues.

Overall, I believe that the idea examined in this paper deserves to be pursued and I strongly encourage the authors to continue their reflection.

Our Response:

We are grateful for your methodical, thought provoking, and most importantly, improvement-oriented comments. You have provided us many points for ongoing reflection and will undoubtedly spur more research in this area. Thank you!

Reviewer: 4
Reviewer Name: Fabian Stroben
Institution and Country: Department of Anesthesiology and Operative Intensive Care Medicine at Campus Benjamin Franklin, Charité-Universitätsmedizin Berlin, Germany
Please state any competing interests or state 'None declared': None declared.

Please leave your comments for the authors below
Thank you very much for your subscription which highlights simulation for needs assessment. I agree with your central finding that Simulation is a very potent tool for uncovering needs of participants while learning and performing skills.
Your article is well structured and carefully limits its message regarding the multiple roles an instructor has during debriefing with simultaneous fostering a needs assessment and give feedback after simulation.
Nevertheless, there are two methodological questions I would like to see addressed in a revised submission:

a) Are the interview/focus group-participants from community hospital the same as the 13 participants who attended in the simulations? This might be a limitation due to the fact, that the same participants express same needs independent of the method (simulation vs. focus group). If yes, this should be addressed in the discussion or the methods section.

Our Response:

Thank you for raising this important question. No, the participants from the interview/focus groups participants were different from those at the community hospital.

b) I also struggle with your cost comparison and your conclusion that HFS and VPS is more cost-effective than focus groups. I calculated costs/participant and also costs/minute transcript and in both calculations, simulation is more expensive than interviews/focus groups. In my opinion, your conclusion that simulation isn't the most cost-effective way of a needs assessment should be more cautious discussed regarding these calculation. Though, more participants/more transcript does not mean more insight in any case.

Our Response:

Thank you for your thought provoking comment. We have revised the conclusion to state that MBS and VPS may be more cost effective under certain conditions. We do note in the manuscript that our research team had access to a simulation center and utilized pre-developed simulation scenarios.

Furthermore I would be interested in further studies addressing the question if instructors after simulation are capable of deriving information for needs assessment based on their experience or/and based on checklists as the TEAM or other ratings tools and if this information are equal to participants' needs. You mentioned to have rated your groups with these instruments but no results are presented in your manuscript. Can you explain why?

Our Response:

Thank you for this insightful comment. The results from these tools have been published in the original manuscript (see Sarti, 2014). However, as with any research endeavour we need to 'bound' our study due to feasibility and resource restriction, and hence the quantitative data was not included in the present study. As well, we are limited by word restrictions according to the journals regulations. We will, however, endeavour to pursue deriving needs assessments based more on rating tools in subsequent studies. Thank you again.

I look forward to read a revised manuscript and will be excited to see your article published in this journal.

Our Response:

Thank you for your encouraging comments.

Reviewer: 5
Reviewer Name: Sandra Johnston
Institution and Country: Queensland University of Technology, Australia
Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below
At the end of the document it is stated that ethical approval was from the Ottawa
The abstract does not describe who the needs assessment is based at Hospital Research Ethics Board. However, a suggestion is this should be mentioned in the manuscript with any other ethical considerations.
Needs assessment needs to be define up front for the reader

Our Response:

Thank you. We will be happy to follow BMJ Open's protocol for the placement of ethical approval information. Also, we have added a definition of needs assessment within the introduction section.

References are old and reference #16 Creswell is incomplete. Simulation is an area of much research and more up to date literature is available

Our Response:

Thank you for catching our error. The reference for Creswell is now complete. We agree that the simulation literature is vast, and in particular there exist many current studies of simulation and qualitative research, especially research that describes the debriefing approaches and processes (see Krogh et al., 2016; Paige et al., 2015; Seymour, 2015 to name only a few). However, we are

unaware of studies that seek to directly compare Manikin-Based Simulation (MBS) and Virtual Patient Simulation (VPS) simulation debriefs with traditional qualitative methods.

The secondary aim of comparing time and costs might be feasible but using simulation to elicit what is needed is going to give very different results from an interview. The simulation would be very focused on a specific condition where as this is not available for the community setting. If the same scenario is discussed with the community group, this needs explanation as it is not clear

Our Response:

Thank you for prompting us to provide more clarity. If we understand you correctly, we agree that the experience around the simulation encounter was specific, however it prompted more broad discussion of themes and gaps applicable more broadly. The themes captured in these debriefing sessions reflect the broader discussion of gaps in the community context.

VERSION 2 – REVIEW

REVIEWER	Patrick Lavoie Postdoctoral fellow, William F. Connell School of Nursing, Boston College, USA
REVIEW RETURNED	29-Mar-2018

GENERAL COMMENTS	Thank you for the opportunity to take a second look at this manuscript. I appreciated reading the authors' responses to the reviewers' comments. Here are a couple of thoughts: I still find the introduction difficult to follow. I believe the context of the Critical Care strategy could be introduced earlier. This would help the reader understand what is meant by 'needs assessment' and what is the relevance of 'comparing simulation to more traditional qualitative methods.' I also believe a clearer definition of simulation is required. I appreciated reading details regarding the original study, the simulations, and the debriefings in the 'methods' section. However, I stand by my previous comments regarding the findings of this study. Based on what's reported in the manuscript, I believe that the two approaches to data collection yielded similar, but complementary findings that cannot be equated. The authors mention explicitly that "the results of this study demonstrate similarities in breadth of themes using traditional methods and simulation debrief with the notable difference in terms of depth." Thus, any claim that one data collection method is more efficient than the other seems rather dubious, considering that the outputs of the methods were not comparable—at least from a qualitative standpoint. It seems to me that the two methods of data collection serve different purposes and, unsurprisingly, yielded different results. Additionally, the study was conducted retrospectively, after authors reviewed recordings of the debriefings and realized that "many of the same themes that were discussed in the larger NA were also identified by participants in these debriefs." Thus, there is no evidence that this would occur in a different type of need

	assessment, especially without a priori knowledge of the needs from a previous study.

REVIEWER	Fabian Stroben Department of Anesthesiology and Operative Intensive Care Medicine, at Campus Benjamin Franklin, Charité-Universitätsmedizin Berlin, Germany
REVIEW RETURNED	16-Apr-2018

GENERAL COMMENTS	Thank you for your review. My feedback was adequately addressed in the revised manuscript. I will leave my colleagues to evaluate if the other responses satisfy their reviewer comments.

VERSION 2 – AUTHOR RESPONSE

Responses to reviewers:
Reviewer: 3
Reviewer Name: Patrick Lavoie
Institution and Country: Postdoctoral fellow, William F. Connell School of Nursing, Boston College, USA
Please state any competing interests or state 'None declared': None declared.

Please leave your comments for the authors below
Thank you for the opportunity to take a second look at this manuscript. I appreciated reading the authors' responses to the reviewers' comments. Here are a couple of thoughts:

I still find the introduction difficult to follow. I believe the context of the Critical Care strategy could be introduced earlier. This would help the reader understand what is meant by 'needs assessment' and what is the relevance of 'comparing simulation to more traditional qualitative methods.' I also believe a clearer definition of simulation is required.

> Our Response:
> Thank you for your comments concerning the introduction of the manuscript. We feel placing the critical care context in the second paragraph of the introduction fits well with our purpose as well as the overall flow of the paper. Specifically, the main constructs are simulation and needs assessment, the critical care strategy is our context. We do agree that we could provide additional detail as to our use of the construct simulation, and have added the following to the introductory paragraph, "s*imulation holds potential as a NA method to promote a better understanding of these gaps given that it aims "to develop an environment that enables the learner to perform naturally to gain insight into the complexity of the actual workplace".*[9 (p59)] *Prior research has demonstrated that simulation permits trainees to live through a realistic experience, make mistakes in a safe environment and practice before they actually perform on real people.(Gordon et. al., 2001; Larue et. al., 2015). Similarly, medical educators find simulation experiences to be stimulating and realistic and provide opportunities for the integration of basic clinical teaching with advanced problem solving especially given the opportunities to reflect on the case after the simulation scenario. (Gordon et. al. 2001).*
>
> Additional References:
> Gordon JA, Wilkerson WM, Shaffer DW, Armstrong E. "Practicing medicine without risk. Students' and Educators' responses to High-fidelity Patient Simulation. *Academic Medicine.* 2001; 76(5):469-72.
>
> Larue C, Pepin J, Allard É. Simulation in preparation or substitution for clinical placement: a systematic review of the literature*. J Nurs Educ Pract*. 2015; 5(9):132-140.

I appreciated reading details regarding the original study, the simulations, and the debriefings in the 'methods' section. However, I stand by my previous comments regarding the findings of this study.

Based on what's reported in the manuscript, I believe that the two approaches to data collection yielded similar, but complementary findings that cannot be equated.

Our Response:
Thank you for your additional investment of time in rereading our manuscript. We agree that the results cannot be equated (i.e., represented as equivalent), however that was not the intent of making qualitative comparisons across the three modalities. Rather than the results being equal (equivalent) we were able to qualitatively compare the findings by examining the degree of similarities amongst and between the themes utilizing qualitative data analysis techniques (Creswell, 2012). We feel that we have been supported here by other reviewers and stand by our claims. To clarify this point in the manuscript we have added the following statement to the limitations section: *"Furthermore, while the results are comparable in terms of frequency of mention they cannot be taken as absolutely equivalent given the qualitative approach employed in this study."*

The authors mention explicitly that "the results of this study demonstrate similarities in breadth of themes using traditional methods and simulation debrief with the notable difference in terms of depth." Thus, any claim that one data collection method is more efficient than the other seems rather dubious, considering that the outputs of the methods were not comparable—at least from a qualitative standpoint. It seems to me that the two methods of data collection serve different purposes and, unsurprisingly, yielded different results.

Our Response:
We agree that the findings of this exploratory study must be interpreted with caution as we note in the discussion section, "*this study explored the **potential** use of MBS and VPS debriefs as NA tools and revealed that debriefs **may be** more efficient **under certain circumstances***." Given that this is an exploratory study, we agree that any claims of efficiency need to be further explored through additional empirical work.

Additionally, the study was conducted retrospectively, after authors reviewed recordings of the debriefings and realized that "many of the same themes that were discussed in the larger NA were also identified by participants in these debriefs." Thus, there is no evidence that this would occur in a different type of need assessment, especially without a priori knowledge of the needs from a previous study.

Our Response:
Thank you for your thought provoking comment. To date, the question of replicability remains an empirical one. However, we think that these results could be replicated in another study with a different purpose, and we feel our exploratory study has provided an innovative area of inquiry for researchers to further investigate our findings. We are currently undertaking a study in the domain of organ and tissue donation and are employing simulation as well as interviews. We feel the comparative techniques use in the current study may be applicable in this other context and we will be excited to share the results once completed.

Reviewer: 4
Reviewer Name: Fabian Stroben
Institution and Country: Department of Anesthesiology and Operative Intensive Care Medicine at Campus Benjamin Franklin, Charité-Universitätsmedizin Berlin, Germany
Please state any competing interests or state 'None declared': None declared.

Please leave your comments for the authors below
Thank you for your review. My feedback was adequately addressed in the revised manuscript. I will leave my colleagues to evaluate if the other responses satisfy their reviewer comments.

Our Response:
Thank you for reviewing our revised manuscript. We appreciate the time you invested as well as your supportive comments.