PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Orthopaedic trauma patients' experiences with emergency department care and follow-up through Virtual Fracture Care review: a qualitative study
AUTHORS	Wilinge, Gijs; Spierings, Jelle; Mathijssen, Elke; Goslings, J. Carel; Twigt, Bas; van Veen, Ruben

VERSION 1 – REVIEW

REVIEWER	Lim , J.W. Aberdeen Royal Infirmary, Trauma and Orthopaedic
REVIEW RETURNED	21-Jul-2023

GENERAL COMMENTS	An interesting paper, first qualitative study on VFC that I know of. This study highlighted few important factors that could affect patient satisfaction that not commonly discussed before. Paper is nicely written and easy to read.

REVIEWER	Phelps, Emma University of Oxford Nuffield Department of Orthopaedics Rheumatology and Musculoskeletal Sciences, Kadoorie Centre
REVIEW RETURNED	18-Aug-2023

GENERAL COMMENTS	This qualitative study aims to explore orthopaedic trauma patients' experiences with emergency department care and follow-up through Virtual Fracture Care review. It is an interesting study. However, the analysis does not provide an in-depth understanding of patient experience as it currently too descriptive. What methodological framework underpinned this study. There is no methodology discussed in the methods section. You describe achieving saturation at 15 interviews. Were any additional interviews conducted beyond saturation to confirm no new findings arise? While 15 is a good sample size in qualitative research, it is small for a heterogeneous maximum variation sample. Please include a copy of your interview schedule. The potential to uncover off-topic information is mentioned twice – what unexpected or off-topic information did you find out about patients experience? No patients/public representatives were involved in this study. Is there a reason you chose not to involve patient and public representatives? Patient and public representatives can add great value to qualitative work (e.g. contributing to the analysis,

	confirming interpretation of data, highlight key areas for your discussion, contributing to the study or to the interview schedule…). As mentioned, the themes are very descriptive and read as a list of codes rather than well-developed analytical themes as would be expected when following Braun and Clark's thematic analysis. Further analysis is required to develop the current analysis to the next stage. This would result in a much richer understanding of patients' experience. I suspect that further analysis may also show that you do not really have saturation after 15 interviews and collecting more data may help your analysis. The themes are described as interrelated – how do they relate to one another and how do they overlap. From the figure, they look like discrete themes. In the table of quotes, no quotes are provided for the categories, relativism, correspondence and facilities. Please included quotes for all categories. The conclusion is very general: "In order to enhance patient experiences, healthcare professionals should consider all of these factors and strive for an optimal balance between them when reorganizing workflows". Can you list specific implications for practice, what do you recommend clinicians' should/can do based on these findings?

REVIEWER	Lans, Amanda Massachusetts General Hospital, Orthopaedic Surgery
REVIEW RETURNED	28-Nov-2023

GENERAL COMMENTS	Thank you for the opportunity to review this manuscript. I recognize the challenges the authors are posed with this type of investigation and applaud their efforts. This is a well written manuscript. This is an important topic and novel approach towards streamlining multidisciplinary care trauma patients are often faced with. This paper gives interesting insights into the experience of orthopaedic trauma patients seen in the ED and emphasizes the importance of how we communicated with our patients. I do have concerns regarding the small sample size of this group and am missing a comparison of how VFC compares to regular care. The authors could try to reframe the message of this investigation to emphasize patient ED experience and benefits of VFC. There is also no mention of any study limitations in the discussion. I would like to give the authors the opportunity to thoroughly revise this manuscript. Introduction - I would like the authors to display the current burden and "rising burden". Ie. What is the current incidence and associated costs, as well as the projected "rising burden" referred to in line 93. Methods - What sample size would be necessary to demonstrate quantitative results? Was a sample size calculation done prior to this investigation? - Why was no control group considered?

	- Authors do not state over what period of time were patients' approach. Results - Authors do not state how many potential patients were missed in the approach. - There were only 15 patients included in this study. I would like to understand how these patients compare to the general population seen at their ED department for orthopaedic trauma. - Interesting to learn patients' perspectives on waiting times and what factors may have a possible positive impact on their experience. Authors did a good job identifying various themes of importance. Discussion - It would be interesting to understand the costs associated with implementing the VFC system. - I worry that this paper is not generalizable because of the small sample size and that it was performed at one institution. - I am missing a comparison with a sample group who didn't receive VFC care. Is it possible for the authors to perform a similar interview with, for example, propensity score matched patients? Or discuss this? - Line 315-317: Arguably ED professionals are always trying to see patients as soon as possible. - There is no discussion of the limited sample size or the challenges of enrollment for this study. Furthermore, the authors could reframe this paper to emphasize how a VFC system improves and alleviates a taxed ED workflow and that the perceived care remains positive. - There is no mention of any limitations of the study. Authors need to discuss the limitations of their investigation in the discussion. General notes: - The discussion needs to be improved. - Healthcare refers to the healthcare system and health care professional refers to the individual providing health care services. Throughout the paper healthcare professionals is used instead of health care.

VERSION 1 – AUTHOR RESPONSE

Reviewer 1: Dr. J.W. Lim , Aberdeen Royal Infirmary

1. Comment:

An interesting paper, first qualitative study on VFC that I know of. This study highlighted few important factors that could affect patient satisfaction that not commonly discussed before. Paper is nicely written and easy to read.

Author's response:

We would like to thank dr. Lim for this comment and the positive response. To our knowledge, our study is indeed the first qualitative study on the VFC review workflow. The goal of this study was therefore to explore and describe factors influencing patient satisfaction, which are indeed in line with currently known factors affecting patient satisfaction. However, in current literature, these factors were not described in the context of the VFC workflow. We believe this study is therefore of added value, especially as VFC workflows are being increasingly implemented globally.

Text changes:

No text changes

Reviewer 2: Dr. Emma Phelps, University of Oxford Nuffield Department of Orthopaedics Rheumatology and Musculoskeletal

1. Comment:
This qualitative study aims to explore orthopaedic trauma patients' experiences with emergency department care and follow-up through Virtual Fracture Care review. It is an interesting study. However, the analysis does not provide an in-depth understanding of patient experience as it currently too descriptive.
Author's response:
Thank you for addressing this. We understand your concern. While depth is a common and rightfully emphasized goal, qualitative research can **also** be conducted with other objectives in mind (especially in studies with an explorative and descriptive nature, such as this study). We conducted a more surface-level exploration to identify general themes and obtain a broad overview without delving deeply into the underlying intricacies of the topic under study. We chose this approach, keeping in mind the predominantly quantitative-oriented target audience and considering that this is the first qualitative evaluation of the VFC review workflow. Naturally, our findings can serve as a foundation for more in-depth qualitative studies in the future.
Text changes:
Changes throughout the manuscript to better reflect the goal of the manuscript stated above.

2. Comment:
What methodological framework underpinned this study. There is no methodology discussed in the methods section?
Author's response:
Thank you for pointing this out. In this study, we opted for a generic qualitative design that is not strictly bound to a specific theoretical framework. In such a design, the emphasis leans towards exploration and description rather than strictly adhering to a one of the known qualitative methodologies. We consider a generic qualitative design the appropriate choice here, given the nature and specific aims of this study: discover and explore firsthand experiences described by individuals within a real-world context. We have clarified this the description of the design.
Text changes:
Changed text in methods section: line 114-115

3. Comment:
You describe achieving saturation at 15 interviews. Were any additional interviews conducted beyond saturation to confirm no new findings arise? While 15 is a good sample size in qualitative research, it is small for a heterogeneous maximum variation sample
Author's response:
Data-saturation was achieved around 13 interviews. The analysis of 2 additional interviews confirmed data saturation. We agree that a maximum variation sample generally requires more participants to achieve data saturation. However, in this study, data saturation could be achieved with these numbers, given the descriptive nature of the analysis we pursued.
Text changes:
No text changes

4. Comment:
Please include a copy of your interview schedule. The potential to uncover off-topic information is mentioned twice – what unexpected or off-topic information did you find out about patients experience?

Author's response:
Thank you for pointing this out, this appendix was missing in the submission. We have supplied our topic list as appendix B.
Regarding the off-topic information, an example of this was that patients mentioned that they perceived healthcare providers working in their own silos, resulting in fragmented care. This is something we did not specifically inquire about, but we obtained this information through the open-ended questions in our topic list. Another example of off-topic information was the specific statements about the preferred delivery mode of information. Further off-topic information can be obtained from the results section and the provided topic list. We hope this sufficiently addresses this comment.
Text changes:
Added appendix B reference: Line 150

5. Comment:
No patients/public representatives were involved in this study. Is there a reason you chose not to involve patient and public representatives? Patient and public representatives can add great value to qualitative work (e.g. contributing to the analysis, confirming interpretation of data, highlight key areas for your discussion, contributing to the study or to the interview schedule…).
Author's response:
Thank you for addressing this. Including patient and public representatives would have undoubtedly enhanced the study, and we are committed to including them in our future research. In our attempt for this study, we made a brief effort to involve patient representatives. Unfortunately, they were not readily accessible as there are no patient institutions for this specific orthopedic trauma population in the Netherlands. Due to time constraints and Due to time constraints and the urgent need for an evaluation of the new process by the hospital board, we proceeded without their involvement. While recognizing the potential value they could have added to our work, we remain confident that our results effectively capture the patients' experiences and offer valuable insights for healthcare professionals in the reorganization or innovation of trauma care workflows.
Text changes:
No text changes

6. Comment:
As mentioned, the themes are very descriptive and read as a list of codes rather than well-developed analytical themes as would be expected when following Braun and Clark's thematic analysis. Further analysis is required to develop the current analysis to the next stage. This would result in a much richer understanding of patients' experience. I suspect that further analysis may also show that you do not really have saturation after 15 interviews and collecting more data may help your analysis.
Author's response:
Thank you for this comment, which we believe aligns with comment #1. Therefore, we would like to refer to our response stated under comment #1. Additionally, for the analysis specifically, the thematic analysis framework developed by Braun and Clarke allows for varying levels of depth depending on the research goals, context, and the specific requirements of the study. The framework is flexible and adaptable, making it suitable for both surface-level and in-depth analyses.
Text changes:
As stated at comment #1

7. Comment:
The themes are described as interrelated – how do they relate to one another and how do they overlap. From the figure, they look like discrete themes.
Author's response:
Thank you for pointing this out. As we did not conduct an explanatory analysis, we could actually not make any statements about relationships between themes. As such, our current statements about this were not adequately informed. To prevent confusion on this matter, we have removed the term 'interrelated' from the article. In the results section, we have provided information on specifically described relationships between factors by our participants. (Results: Line 197, line 202, line 276). These are also further addressed in the discussion section.
Text changes:
Removed the term 'interrelated' throughout the manuscript

8. Comment:
In the table of quotes, no quotes are provided for the categories, relativism, correspondence and facilities. Please included quotes for all categories.
Author's response:
Thank you for addressing this, we have added quotes in these categories to better illustrate our results in these categories.

Text changes:
Added quotes to the stated categories. Q#12, Q#17, Q#19

9. Comment:
The conclusion is very general: “In order to enhance patient experiences, healthcare professionals should consider all of these factors and strive for an optimal balance between them when reorganizing workflows“. Can you list specific implications for practice, what do you recommend clinicians’ should/can do based on these findings?
Author’s response:
Thank you for addressing this, we acknowledge the reviewer's comment regarding the general phrasing of the conclusion. Based on our results, clinicians aiming to improve patient satisfaction and enhance experiences should address the following topics: 1) Anticipate on the evolving information needs post-ED visit 2) active engagement of patients early in the ED process, clarifying the care process to shape expectations. 3) Active involvement of patients in treatment steps, which can be as simple as through showing medical images and explaining why decisions are made 4) Expanding the scope of information provision and scheduling of treatment across the entire treatment pathway, rather than just up to the next contact moment. This enables patients to develop more realistic expectations for the complete treatment, potentially preventing mismatches between expectations and actual experiences later on in the patient journey.
We have rephrased the text and added more specific implications for clinicians in the conclusion.
Text changes:
Changed text in conclusion section: Line 384-392

Reviewer 3: Dr. Amanda Lans, Massachusetts General Hospital

General
1. Comment:
I recognize the challenges the authors are posed with this type of investigation and applaud their efforts. This is a well written manuscript. This is an important topic and novel approach towards streamlining multidisciplinary care trauma patients are often faced with. This paper gives interesting insights into the experience of orthopaedic trauma patients seen in the ED and emphasizes the importance of how we communicated with our patients. I do have concerns regarding the small sample size of this group and am missing a comparison of how VFC compares to regular care. The authors could try to reframe the message of this investigation to emphasize patient ED experience and benefits of VFC. There is also no mention of any study limitations in the discussion. I would like to give the authors the opportunity to thoroughly revise this manuscript.
Author’s response:
We would like to thank Dr. Lans for the opportunity to respond to the stated comments and to revise our manuscript where necessary. We hope our response will adequately answer all questions and sufficiently address the stated concerns.
Text changes:
See comments and author responses below

Introduction
1. Comment:
I would like the authors to display the current burden and “rising burden”. Ie. What is the current incidence and associated costs, as well as the projected “rising burden” referred to in line 93
Author’s response:
Thank you for addressing this, we have added the specific numbers of these injuries in the text to further substantiate the current burden, additional to solely referring to REF 1. These numbers are extracted from this referred document: the annual national report on the numbers of injuries in the

Netherlands, version 2022. This report also shows the rising burden referred to in line 93. To illustrate: This number was ± 550.000 in 2020, 600.000 in 2021 and 661.000 in 2022. This is number is expected to further increase in 2023. This report also shows the associated costs of these injuries in detail. As the focus of the text was currently largely on this burden and not on the patient satisfaction and quality of care, we have rephrased the text to improve this.

Text changes:

Line 87-96: changed text

Methods

1. Comment:

What sample size would be necessary to demonstrate quantitative results? Was a sample size calculation done prior to this investigation?

Author's response:

Thank you for your concern. However, our study did not include quantitative results, because this study had a descriptive qualitative study design. Therefore, based on this study and the concomitant qualitative outcomes, it is not possible to provide a number for a sample size to demonstrate quantitative results. If this were a quantitative study, the sample size would be dependent on the type of quantitative outcome measure used, which would in its turn be dependent on the type of quantitative data that would be demonstrated.

To address the second question, we did not calculate a sample size a priori, as our required sample size was guided by the principle of data saturation and exactly determined a posteriori, which is the standard in qualitative research (described in line 135-136, ref 15 + 16).

We hope this sufficiently answers the questions in this comment.

Text changes:

None

2. Comment:

Why was no control group considered?

Author's response:

Thank you for addressing this. We chose an explorative, descriptive qualitative study design, rather than a comparative quantitative design, to gain a broad understanding of the experiences with the current VFC review workflow. The rationale for this was that we wanted to investigate the factors that influenced patient satisfaction and experiences with the emergency department and virtual fracture care review process, rather than compare different workflows. To our knowledge, the VFC review workflow has not been qualitatively evaluated in this way before. A comparison of different innovative workflows with traditional workflows would potentially be a focus for future research. However, for this purpose, a comparative quantitative study design using for example satisfaction scores could be more suitable, as these outcomes would be uniform and easier to compare. We have further specified this in the future research section.

Text changes:

Changed text: Line 384

3. Comment:

Authors do not state over what period of time were patients' approached.

Author's response:

Thank you for your comment. We believe this can be clarified with the current text provided in the methods section of the manuscript (line 116). We approached patients who presented to the emergency department of our institution between June and September 2022 (described in line 116 in the text). Patients were called on the first workday after their ED visit within this time period. We hope this sufficiently clarifies this issue.

Text changes:
No text changes

Results

1. Comment:
Authors do not state how many potential patients were missed in the approach.
Author's response:
Thank you for addressing this. We chose not to state the number of potential patients as did not add significant value to the results due to our qualitative study design. The (purposive) inclusion was performed up until a sufficiently heterogeneous sample was reached and the data collection was completed based on the principle of data saturation. The number of missed patients does not add relevant information to our study sample and does not influence the experiences collected from our specific sample. For a quantitative evaluation, this would certainly have been relevant. We did provide the number of invited patients for participation in our sampling (line 181). We hope this sufficiently clarifies why we chose not to state this number in the results section.
Text changes:
No text changes

2. Comment:
There were only 15 patients included in this study. I would like to understand how these patients compare to the general population seen at their ED department for orthopaedic trauma
Author's response:
For this study, this sample size was deemed sufficient, as data saturation was achieved after 15 interviews. In the selection of patients, we used a purposive maximum variation sampling method to ensure a heterogeneous sample in terms of gender, age, type of injury and treatment strategy to represent the great variety orthopedic trauma patients that visit the ED with an injury. The goal of this study was to describe the influential factors on patient experiences from different patient perspectives and thus, we chose this approach to make sure we could collect a sufficiently broad array of experiences. As such, we did not focus on the comparison of our sample to the general ED population regarding patient characteristics, but rather on the heterogeneity within our sample. Unlike quantitative research, where statistical methods are often used to compare or generalize findings to a larger population, statistical generalization is not the primary goal of this qualitative study. However, analytical generalization may be possible when findings gained from this study can be applied to similar contexts or populations (even if not statistically representative). Furthermore, as shown in table 1, our sample consisted of more patients who were non-operatively treated compared to operative treatment (which aligns with the general trauma population), and injuries with a relatively high known incidence rate were included more than injuries with lower incidence rate (eg, 3 included patients with a distal radius fracture and 1 patient with a talus fracture).
We hope this offers sufficient explanation regarding this subject.
Text changes:
No text changes

3. Comment:
Interesting to learn patients' perspectives on waiting times and what factors may have a possible positive impact on their experience. Authors did a good job identifying various themes of importance.
Author's response:
We would like to thank Dr. Lans for this positive feedback.
Text changes:
No text changes

Discussion

1. Comment:

It would be interesting to understand the costs associated with implementing the VFC system.
Author's response:
Thank you for addressing this and we certainly agree with this point. A cost-effectiveness study would be an interesting approach to further evaluate the financial aspect of this specific virtual fracture care review workflow. However, for this study, the scope was solely on the patient experiences with the emergency department care and virtual fracture care review process in the new workflow. For now, we can only state that the virtual fracture care workflow was implemented at our institution using existing resources and available medical personnel.
Text changes
No text changes

2. Comment:
I worry that this paper is not generalizable because of the small sample size and that it was performed at one institution.
Author's response:
We agree with this point and acknowledge this limitation. We have addressed this in the final paragraph of the discussion section, where the limitations of the study are stated (line 372). Unfortunately, our institution is the only institution in the Netherlands which utilizes this particular Virtual Fracture Care review workflow. However, although other centers may not use this specific workflow, our study still provides valuable data for healthcare professionals to take into account when reorganizing or innovating their own trauma care workflows.
Text changes
No text changes

3. Comment:
I am missing a comparison with a sample group who didn't receive VFC care. Is it possible for the authors to perform a similar interview with, for example, propensity score matched patients? Or discuss this?
Author's response:
We understand this concern and believe this is in line with comment #2 on the methods section regarding the consideration of including a control group. For this study, our purpose was to explore the influential factors that shape the patient experience and gain an in-depth understanding, rather than compare the experiences between different workflows. A comparison with a non-VFC group was therefore outside of the scope of this study.
Text changes
No text changes

4. Comment:
Line 315-317: Arguably ED professionals are always trying to see patients as soon as possible.
Author's response:
Thank you for pointing this out, this specific point was unnecessarily stated. We have changed the text accordingly.
Text changes:
Changed line 315-317

5. Comment:
There is no discussion of the limited sample size or the challenges of enrollment for this study. Furthermore, the authors could reframe this paper to emphasize how a VFC system improves and alleviates a taxed ED workflow and that the perceived care remains positive.
Author's response:

We understand this comment, which we believe aligns with the aforementioned comments on the small sample size and the lack of comparison to the pre-VFC situation. We would like to address the points separately:
1. Within our explorative qualitative methodology, we based our sample size on the principles of data saturation. This was achieved after 15 interviews, which indicates we reached a large enough sample for this specific study design. In our opinion, the sample size was therefore not specifically limited, but rather sufficient for the purposes of this study. As we reached our intended sample size, the enrollment for this study was not specifically challenging. Therefore, we did not discuss this as a limitation in the manuscript.
2. We could not specifically state whether the VFC system improved and alleviated a taxed ED workflow as our study was not comparative. With this specific study, our goal was to describe the influential factors that shape patient expectations and see how the VFC review workflow addressed these. We certainly agree a comparative study to evaluate the VFC review workflow would be of significant added value. Therefore, we are currently performing comparative studies in which we compare VFC workflow to the pre-VFC workflows. However, as supported by the stated reviewer comments, this requires quantitative evaluation using larger samples and other outcomes.

We hope this sufficiently clarifies these points and we invite the reviewers to read our coming work on the comparison of the VFC review workflow to the pre-VFC workflow.
Text changes:
Added text: Line 380

6. Comment:
There is no mention of any limitations of the study. Authors need to discuss the limitations of their investigation in the discussion.
Author's response:
Thank you for addressing this. The limitations are described in the last paragraph of the discussion. However, this was not clearly stated at the beginning of the paragraph. We have clarified this in the text. We have also added text to the beginning of the second to last paragraph describing the study's strengths.
Text changes
Added text: line 360
Added text: line 370

General notes:
Comment:
The discussion needs to be improved.
Author's response:
We hope that with these responses, we have clarified the reviewers concerns regarding the discussion section and that this section has sufficiently improved.
Text changes:
As stated in the comments above.

Comment:
Healthcare refers to the healthcare system and health care professional refers to the individual providing health care services. Throughout the paper healthcare professionals is used instead of health care.
Author's response:
Thank you for pointing out this flaw. We have corrected this in the revised manuscript.
Text changes:
Changed 'healthcare professionals' to 'health care professionals' throughout the text.

VERSION 2 – REVIEW

REVIEWER	Phelps, Emma University of Oxford Nuffield Department of Orthopaedics Rheumatology and Musculoskeletal Sciences, Kadoorie Centre
REVIEW RETURNED	05-Jan-2024

GENERAL COMMENTS	I am sorry this manuscript is not suitable for publication as qualitative research. The topic is interesting, and I appreciate the work the authors have done and the value of their findings for service development. While the authors have responded to some of my comments, they have not addressed my main concern regarding the lack of depth in their analysis. The authors have clarified that their study adopted a generic qualitative approach. This approach aims to provide a rich description without adhering to a specific methodology. As mentioned in my previous review, this analysis does not provide a rich description of factors influencing patient satisfaction of VFC. I recommend further analysis is undertaken before this could be published as qualitative research. If the authors would like to do this, I am happy to read their manuscript again.

VERSION 2 – AUTHOR RESPONSE

Dear editorial office of BMJ Open,

Thank you for reconsidering our manuscript for publication. Attached you will find the response to the reviewers remaining comment (including the previous comments and revisions already adressed).

Please do not hesitate to contact me in case of any questions or concerns,

Best regards,

Dr. Gijs Willinge