PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	What insights do patients and caregivers have on acute kidney injury and post-hospitalization care? A single-center qualitative study from Toronto, Canada
AUTHORS	Silver, Sam; Saragosa, Marianne; Adhikari, Neill; Bell, Chaim; Harel, Ziv; Harvey, Andrea; Kitchlu, Abhijat; Neyra, Javier; Wald, Ron; Jeffs, Lianne

VERSION 1 – REVIEW

REVIEWER	Stephanie Thompson University of Alberta, Edmonton, Canada
REVIEW RETURNED	02-Feb-2018

GENERAL COMMENTS	In this qualitative study, Silver et al. conducted semi-structured interviews with patient and caregivers' to understand perspectives on hospitalization with AKI. The objectives are clear and overall, the paper is well written. My comments primarily relate to strengthening the methodological rigor so that the analysis and reporting is in keeping with that of qualitative inquiry. Strengths and limitations -This section could be revised to better highlight for the reader the contribution this work makes to the literature. Currently, contains only generic information about methods and the relevance overlooked. -As with experimental research, reporting in accordance with a standard reporting structure is an expectation & it seems odd to see this featured here. -As the approach (and philosophy) to evaluating rigor in qualitative research is fundamentally different that experimental research, the mention of bias is not relevant. Please also refer to mention of this in the discussion section. Related concepts in qualitative inquiry such as credibility could be discussed instead. This is important because depending on the methodology, expertise in nephrology or 'prolonged engagement' would actually strengthen the methodological rigor by suggesting that the research was conducted by someone with an accurate and in-depth understanding of the phenomenon under study. Methods Method versus methodology: I understand that the analysis used using a thematic method however, no methodology is identified. The methodology provides the reader with and frame or understanding of why certain methods were chosen and how to evaluate rigor. It is also critical to understanding whether the authors took purely descriptive approach to the data or were also aiming to interpret their findings in the relevant social context.

	Results The quote from patients 001 & 003 do not seem linked to the subtheme of “Omission of AKI from the medical history” the data. Seems to be more about comprehension. Similarly, the data shown in the table does not clearly convey that the multiple specialists were a source of stress. The interview guide is well-developed with open to then more focused questions. Given this and the number of questions I wonder if there is additional data to support some of the subthemes? Discussion This is well written and clearly communicates the relevance of the work by contextualizing the findings with the challenges of care delivery for a multi-morbid population. The limitations should be described in more detail and briefly touch on the principles of qualitative research: credibility, confirmability, transferability, trustworthiness. For ex, regarding the stated limitations, within the qualitative paradigm, purposive sampling is generally how people are selected for participation and “self-selection” per se is not a weakness. Rather, it is whether the method of sampling was appropriate for the research question & I think it was.

REVIEWER	James Burton University of Leicester, UK.
REVIEW RETURNED	09-Feb-2018

GENERAL COMMENTS	In this paper, Silver et al very eloquently outline the main themes that could contribute to why patients' follow up after an episode of AKI is suboptimal. This is novel and of real interest; I think it would certainly add value to the current literature and is worthy of publication. I enjoyed reading it. I have no concerns over the methodology which is explained clearly. The sample size is adequate for a qualitative study and justified succinctly in the text. I really have only a few minor comments: 1. Page 10 'Participant Characteristics': the authors state in the text and in table 1 that there were 17 unique patients; there were 20 interviews comprising 15 with patients and 5 caregivers. I am guessing therefore that data for 2 of the unique patients was obtained from caregivers only? Also, I am not clear whether the 3 caregivers that gave data on patients also interviewed conducted those interviews separately or together with the patient? That is important to clarify in the text as could affect what is said. Finally on this point, it says that 2 of the caregivers were 'children' but again I am guessing that they were still adults, just that they were grown-up children of patients' whose average age was 68.4 years? I know it is a small point but it could be interpreted that some of the interviews were with paediatric subjects. 2. 'Complicated discharge plans' on p13: This is not a criticism of the data presented in this manuscript as it was outside the scope of the study but I would be really interested to know what the physicians' opinions would have been about the level of advice and education

	they thought the patient had received to understand if there is a gap in what patients vs. health care providers thought about advice given. Do the authors have any comment on that to add to the discussion? 3. p15 line 22: I think 'limited information about..' might read better that 'limited information on...' 4. p16 line 45: 'The latter's "Think Kidneys" programs' rather than 'the latter....' 5. p17: when talking about table 3 it looks like some of the information has been omitted? The last 3 elements of 'Medication changes...' etc are blank in the columns 'Communication' and 'Format'. Initiatives such as co-designed discharge summaries, easy-to-understand format etc should be in the table? 6. The limitations are nicely summarised. I would perhaps add in that there are no interview data either from physicians / health care staff or patient focus groups. 7. Table 2 is well laid out. I wonder if it might be nice for the reader of this manuscript, once published, to see a 'top-line' quote from each of those themes in the main body of the text? It would help to keep a sense of the results while reading without dancing between text and table. That is purely a personal comment and I leave it to the authors and editors to decide on that.

REVIEWER	Ann O'Hare University of Washington, USA
REVIEW RETURNED	13-Feb-2018

GENERAL COMMENTS	This an interesting well-executed qualitative study of patients who had an episode of AKI while in the hospital and their caregivers. The study adds important insights about how patients and their caregivers view AKI in the wider context of their other health issues. The quotations support the themes and sub-themes and the findings generally right true. I have the following suggestions for improvement: 1. The manuscript conveys a sense of the authors "knowing best" with the patient and caregiver perceptions are framed as a lack of knowledge or insight. The piece might be a bit stronger if in the introduction and discussion, the authors acknowledged some of the complexity and uncertainty surrounding episodes of AKI as well as the heterogeneity of this condition, the somewhat arbitrary and technical nature of how this is defined and the lack of strong evidence to support prevention and management. In many ways the participants' perspectives are quite reasonable, AKI is very often more a marker of the severity of other health conditions, kidney function does often return to normal after an episode of AKI in individual patients although on a population level it is associated with progression to ESRD, and preventing further episodes of AKI often does hinge on how other health conditions are managed. Messages around AKI may also be conflicting depending on where these messages are coming from. It may be good to reference some of the literature on multimorbidity (Boyd CM, Darer J, Boult C, Fried LP, Boult L, Wu AW. Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance. JAMA. 2005;294(6):716-724 and Guiding principles for the care of older adults with multimorbidity: an approach for clinicians" and Guiding principles for the care of older adults with multimorbidity: an approach for clinicians: American Geriatrics Society Expert Panel on the Care of Older Adults with Multimorbidity. J Am Geriatr Soc. 2012;60(10):E1-E25), and as it

	pertains to patients with kidney disease (Bowling CB, Vandenberg AE, Phillips LS, McClellan WM, Johnson TM, 2nd, Echt KV. Older Patients' Perspectives on Managing Complexity in CKD Self-Management. Clin J Am Soc Nephrol. 2017;12(4):635-643). 2. Methods: did the authors use coding software (eg atlas)? 3. in the results there seems to be a discrepancy in the number of patients interviewed: "We interviewed 15 patients and 5 caregivers; 3 caregivers were related to the patient participants. Of the 17 unique patients..."

VERSION 1 – AUTHOR RESPONSE

Itemized Responses to Reviewer Comments

Editors' Comments
Comment 1: Please revise your title to state the research question, study design, and setting (location). This is the preferred format for the journal.

Response: We have revised the title to: "What insights do patients and caregivers have on acute kidney injury and post-hospitalization care? A single-center qualitative study from Toronto, Canada"

Reviewer 1
In this qualitative study, Silver et al. conducted semi-structured interviews with patient and caregivers to understand perspectives on hospitalization with AKI. The objectives are clear and overall, the paper is well written. My comments primarily relate to strengthening the methodological rigor so that the analysis and reporting is in keeping with that of qualitative inquiry.

Response: We are pleased that the Reviewer found the manuscript clear and well-written; we appreciate her comments to strengthen our methodological reporting.

Strengths and limitations
Comment 1: This section could be revised to better highlight for the reader the contribution this work makes to the literature. Currently, contains only generic information about methods and the relevance overlooked. As with experimental research, reporting in accordance with a standard reporting structure is an expectation & it seems odd to see this featured here.

Response: We agree with the Reviewer and originally focused on the methods in this section as per journal instructions. We have now introduced a statement on the relevance of this work to the literature, as per the Reviewer suggestions. We defer to the Editors' on which statements to include based on the preferred journal format.

Change 1 (page 4): First report of patient and caregiver experiences with acute kidney injury (AKI), which informs patient-centered strategies to improve care transitions after a hospitalization with AKI

Change 2 (page 4): Semi-structured interviews allowed the researchers to thoroughly explore participants' understanding of AKI and its long-term consequences

Comment 2: As the approach (and philosophy) to evaluating rigor in qualitative research is fundamentally different that experimental research, the mention of bias is not relevant. Please also refer to mention of this in the discussion section. Related concepts in qualitative inquiry such as credibility could be discussed instead. This is important because depending on the methodology, expertise in nephrology or 'prolonged engagement' would actually strengthen the methodological rigor by suggesting that the research was conducted by someone with an accurate and in-depth understanding of the phenomenon under study.

Response: Thank you for providing us the opportunity to clarify this point in the manuscript. We have removed the term bias, as well as expanded on the credibility of our research team in the Discussion.

Change (page 18): Despite these limitations, the use of semi-structured interviews allowed our research team to thoroughly explore participants' understanding of AKI and its long-term consequences. Our interview team was experienced with concepts related to post-hospital care transitions and the challenges faced by participants during this time (references cited), thereby strengthening the credibility of our findings.

Methods

Comment 3: Method versus methodology: I understand that the analysis used using a thematic method however, no methodology is identified. The methodology provides the reader with and frame or understanding of why certain methods were chosen and how to evaluate rigor. It is also critical to understanding whether the authors took purely descriptive approach to the data or were also aiming to interpret their findings in the relevant social context.

Response: We have clarified in the Methods that a descriptive inductive qualitative design was employed.

Change (page 7): We conducted a qualitative study using a descriptive inductive design with individual semi-structured interviews.

Result

Comment 4: The quote from patients 001 & 003 do not seem linked to the subtheme of "Omission of AKI from the medical history" the data. Seems to be more about comprehension. Similarly, the data shown in the table does not clearly convey that the multiple specialists were a source of stress. The interview guide is well-developed with open to then more focused questions. Given this and the number of questions I wonder if there is additional data to support some of the subthemes?

Response: The quotes from "Patient Care U-001" and "Patient U-003" are linked to "omission of AKI from the medical history" because due to their low comprehension of AKI the participants state that their kidneys are fine and no longer a concern. We acknowledge that this does not explicitly state that AKI will be omitted from the medical history, and so have replaced these quotes with a more explicit statement. Similarly, we have expanded on the quotes for the final sub-theme to convey that multiple specialists were a source of stress for some patients and caregivers.

Change 1 (Table): It's funny because I just got a Medic-Alert on Monday night and I thought it wouldn't hurt to have a Medic-Alert if something ever happened at least they would know what drugs I take in there and different things like having a central line. They ask you all that information you know, about your health and you know I don't even think I did say anything about my kidneys.

Change 2 (Table): It was oh you can go home next week. Oh it will be Tuesday and you know, I'm saying well what happens with this? I'm, I need stroke rehab, you know you've been giving me choices for rehab places to go to that has to have a stroke unit, and now suddenly I can go home and what's changed? And what do I need? And who looks after me when I get there? And, do I organize the radiotherapy and kidney clinic myself? Or how does that happen? So finally when I did get home, I had some paperwork that said I would be contacted by ABCD, ABC so far not D.

Change 3 (Table): The information is flowing from all of these sources back to both the cardiologist and the endocrinologist, and also my family doctor, so I've got three guys that are involved here looking after things and keeping me on the straight and narrow. I've got another follow-up appointment coming early next year with regard to the endocrinologist. Also going back to another session with the gal on the pacemaker. I'm managing it and my wife and I are managing it as far as the appointments go. They're all scheduled and usually at the end of one session I'm booking the next session right away.

Discussion

Comment 5: This is well written and clearly communicates the relevance of the work by contextualizing the findings with the challenges of care delivery for a multi-morbid population. The limitations should be described in more detail and briefly touch on the principles of qualitative research: credibility, confirmability, transferability, trustworthiness. For ex, regarding the stated limitations, within the qualitative paradigm, purposive sampling is generally how people are selected for participation and “self-selection” per se is not a weakness. Rather, it is whether the method of sampling was appropriate for the research question & I think it was.

Response: We have expanded the Methods section on credibility and trustworthiness, as well as listed the former as a strength in the Discussion (as we did not perceive credibility to be a limitation in our study). While we agree purposive sampling does not affect the internal validity of our work, we still think it is important to mention that our results may not be generalizable to other patients with AKI (especially since AKI is a heterogenous condition with many causes).

Change 1 (page 9): Strategies to ensure trustworthiness and credibility of the data included having three different coders to establish intercoder reliability and employing an iterative approach to analysis. In the latter case, the two primary investigators analyzed the data while the interviews were being conducted and then further probed emergent key themes with study participants as a form of member checking

Change 2 (page 18): Despite these limitations, the use of semi-structured interviews allowed our research team to thoroughly explore participants’ understanding of AKI and its long-term consequences. Our interview team was experienced with concepts related to post-hospital care transitions and the challenges faced by participants during this time (references cited), thereby strengthening the credibility of our findings.

Reviewer 2
In this paper, Silver et al very eloquently outline the main themes that could contribute to why patients' follow up after an episode of AKI is suboptimal. This is novel and of real interest; I think it would certainly add value to the current literature and is worthy of publication. I enjoyed reading it. I have no concerns over the methodology which is explained clearly. The sample size is adequate for a qualitative study and justified succinctly in the text. I really have only a few minor comments:

Response: We are pleased that the Reviewer found this qualitative study of patients and caregivers after a hospitalization with AKI to be a valuable academic contribution, novel, and methodologically appropriate.

Comment 1: Page 10 'Participant Characteristics': the authors state in the text and in table 1 that there were 17 unique patients; there were 20 interviews comprising 15 with patients and 5 caregivers. I am guessing therefore that data for 2 of the unique patients was obtained from caregivers only? Also, I am not clear whether the 3 caregivers that gave data on patients also interviewed conducted those interviews separately or together with the patient? That is important to clarify in the text as could affect what is said. Finally on this point, it says that 2 of the caregivers were 'children' but again I am guessing that they were still adults, just that they were grown-up children of patients' whose average age was 68.4 years? I know it is a small point but it could be interpreted that some of the interviews were with paediatric subjects.

Response: Thank you for these important comments that allow us to clarify the participant characteristics. We conducted 20 unique interviews:

- 12 with patients alone
- 2 with caregivers alone
- 3 with patient/caregiver pairs (interviewed separately, so 6 total interviews)

The Reviewer is correct that both caregiver children were adults. We have clarified these points throughout the manuscript.

Change 1 (page 7): We recruited patients and caregivers after an inpatient stay at a single, urban teaching hospital. Eligible patients were ≥ 18 years of age with KDIGO stage 2 AKI or greater; caregivers also were required to be ≥ 18 years of age.

Change 2 (page 8): We interviewed patients and caregivers separately in cases where both agreed to participate.

Change 3 (page 10): We conducted 20 separate interviews: 12 with patients only, 2 with caregivers only, and 3 patient/caregivers pairs (conducted separately, so 6 interviews total). Of the 17 unique patients (12 patient-only interviews, 2 caregiver-only interviews, and 3 patient-caregiver pairs)…

Comment 2: 'Complicated discharge plans' on p13: This is not a criticism of the data presented in this manuscript as it was outside the scope of the study but I would be really interested to know what the physicians' opinions would have been about the level of advice and education they thought the patient had received to understand if there is a gap in what patients vs. health care providers thought about advice given. Do the authors have any comment on that to add to the discussion?

Response: We are not aware of any literature on physician opinions about the level of education provided after a hospitalization with AKI…this would be an important area to pursue further. However, we do reference studies that note a discrepancy in discharge summary quality for patients with AKI (pages 16-17). We could reference studies from other disease-states to see if a gap exists, but such studies may not be relevant to AKI. For these reasons, we prefer to focus our Discussion on system-based efforts to educate patients and facilitate knowledge transfer after a hospitalization with AKI instead of hypothesizing on healthcare provider opinions of the level of education provided when little data exists.

Comment 3: p15 line 22: I think 'limited information about..' might read better that 'limited information on...'

Response: We have made this change.

Comment 4: p16 line 45: 'The latter's "Think Kidneys" programs' rather than 'the latter....'

Response: Thank you for pointing out this error, which we have fixed.

Comment 5: p17: when talking about table 3 it looks like some of the information has been omitted? The last 3 elements of 'Medication changes...' etc are blank in the columns 'Communication' and 'Format'. Initiatives such as co-designed discharge summaries, easy-to-understand format etc should be in the table?

Response: Thank you for this feedback. Table 3 is meant to be read only down the columns and not horizontally. We have now eliminated the grid lines and added bullets to make the intended flow of information more clear.

Comment 6: The limitations are nicely summarised. I would perhaps add in that there are no interview data either from physicians / health care staff or patient focus groups.

Response: We have incorporated this limitation into the Discussion, as suggested.

Change (page 18): A more complete understanding of AKI and post-hospitalization care could also have been provided by involving physicians and other healthcare staff in interviews or focus groups, but resource limitations precluded their involvement.

Comment 7: Table 2 is well laid out. I wonder if it might be nice for the reader of this manuscript, once published, to see a 'top-line' quote from each of those themes in the main body of the text? It would help to keep a sense of the results while reading without dancing between text and table. That is purely a personal comment and I leave it to the authors and editors to decide on that.

Response: We attempted to incorporate some quotes into the text, which we indicate with italics. We prefer to leave all the quotes in Table 2 for easy reference. We would be willing to highlight one quote per sub-theme (right after the sub-theme) in the manuscript, at the editors' discretion.

Reviewer 3
This an interesting well-executed qualitative study of patients who had an episode of AKI while in the hospital and their caregivers. The study adds important insights about how patients and their caregivers view AKI in the wider context of their other health issues. The quotations support the themes and sub-themes and the findings generally right true. I have the following suggestions for improvement:

Response: We are appreciate that the Reviewer found our study to be interesting, well-executed, and contributes meaningful insights on patient and caregiver perspectives after a hospitalization with AKI

Comment 1: The manuscript conveys a sense of the authors "knowing best" with the patient and caregiver perceptions are framed as a lack of knowledge or insight. The piece might be a bit stronger if in the introduction and discussion, the authors acknowledged some of the complexity and uncertainty surrounding episodes of AKI as well as the heterogeneity of this condition, the somewhat arbitrary and technical nature of how this is defined and the lack of strong evidence to support prevention and management. In many ways the participants' perspectives are quite reasonable, AKI is very often more a marker of the severity of other health conditions, kidney function does often return to normal after an episode of AKI in individual patients although on a population level it is associated with progression to ESRD, and preventing further episodes of AKI often does hinge on how other health conditions are managed. Messages around AKI may also be conflicting depending on where these messages are coming from.

It may be good to reference some of the literature on multimorbidity (Boyd CM, Darer J, Boult C, Fried LP, Boult L, Wu AW. Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance. JAMA. 2005;294(6):716-724 and Guiding principles for the care of older adults with multimorbidity: an approach for clinicians" and Guiding principles for the care of older adults with multimorbidity: an approach for clinicians: American Geriatrics Society Expert Panel on the Care of Older Adults with Multimorbidity. J Am Geriatr Soc. 2012;60(10):E1-E25), and as it pertains to patients with kidney disease (Bowling CB, Vandenberg AE, Phillips LS, McClellan WM, Johnson TM, 2nd, Echt KV. Older Patients' Perspectives on Managing Complexity in CKD Self-Management. Clin J Am Soc Nephrol. 2017;12(4):635-643).

Response: It was not our intent to convey an “authors knowing best” message. Rather, our objective was to give a voice to patients and caregivers. We appreciate the Reviewer pointing this out, so that we could make some changes to better represent the patient voice. As suggested, we have also added to the Introduction and Discussion to acknowledge the complexity and uncertainty surrounding post-AKI care, especially as it relates to multimorbidity and other chronic illnesses.

Change 1 (page 5-6): There are multiple explanations for these potential gaps in care, including the lack of strong evidence to guide post-AKI care and the heterogeneity of AKI itself. Patients who experience AKI are often older and suffer from multiple medical comorbidities, with AKI sometimes representing a marker of the severity of other health conditions (references cited). In these cases, prioritization of other chronic diseases over AKI may be reasonable and beneficial for patients (references cited).

Change 2 (page 16): We suspect that some of the lack of attention dedicated to AKI by patients and caregivers is related to their prioritization of other health conditions and variability in comprehension of the significance of AKI. It is important to interpret these perspectives in context. For example, these responses may be appropriate depending upon the severity of other illnesses and the degree of kidney recovery at hospital discharge. Prioritization of comorbidities is a recognized self-management strategy for elderly patients with kidney disease (reference cited), and these observations underscore the heterogeneity of AKI and the complexity of integrating post-AKI care in a manner that considers patient multimorbidity and preferences (references cited). Even if other health conditions are appropriately prioritized over AKI in some instances, discharge summary AKI content can still be improved. In one study, monitoring advice after AKI was provided to only 6/75 (8%) patients and causes of AKI communicated to only 1/75 (1%) patients (reference cited). It is hard to expect patients and caregivers to prioritize a condition that they do not completely understand, especially given multiple competing health demands during the post-discharge period.

Change 3 (page 19): With in-hospital survival after AKI improving, patient-centered tools and decision aids are needed to bridge the gap between a hospitalization with AKI and the safe transition to outpatient care that also respects the multiple competing health demands faced by patients post-discharge.

Comment 2: Did the authors use coding software (eg atlas)?

Response: Given the discrete number of interviews, coding software was not used in the analysis.

Change (page 9): We did not use coding software due to the discrete number of interviews completed.

Comment 3: In the results there seems to be a discrepancy in the number of patients interviewed: "We interviewed 15 patients and 5 caregivers; 3 caregivers were related to the patient participants. Of the 17 unique patients..."

Response: Thank you for raising this issue, which we have now clarified in our response to Reviewer 2, Comment 1.

VERSION 2 – REVIEW

REVIEWER	James Burton University of Leicester, UK.
REVIEW RETURNED	23-Mar-2018

GENERAL COMMENTS	I would like to thank the authors for outlining their changes to the manuscript which have addressed all my comments. I think it reads well and I look forward to seeing the published version.

REVIEWER	Stephanie Thompson University of Alberta
REVIEW RETURNED	08-Apr-2018

GENERAL COMMENTS	The comments have been addressed.

REVIEWER	Ann O'Hare University of Washington 28-Apr-2018
REVIEW RETURNED	

GENERAL COMMENTS	The authors have adequately addressed my concerns on the first draft of the manuscript. This will be a good contribution to the literature.