

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Exploring the ripple effects of an Australia hospital redevelopment: A protocol for a longitudinal, mixed-methods study
AUTHORS	Pomare, Chiara; Churruca, Kate; Long, Janet; Ellis, Louise A.; Gardiner, Brett; Braithwaite, Jeffrey

VERSION 1 – REVIEW

REVIEWER	Christian Gericke University of Queensland, Australia
REVIEW RETURNED	15-Nov-2018

GENERAL COMMENTS	Interesting study protocol. This would be a an even more interesting study if conducted in more than one hospitals. My only concern is that another limitation of the study is not mentioned: the decision which wards are moved into the new building and therefore renovated is not a random decision. This introduces a major selection bias which has not been mentioned by the authors. This limits the generalisability of the study results even further. In my opinion, this is more of a demonstration project rather than an elaborate study as sold to the reader. A more careful presentation is warranted.
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REVIEWER	Lucio Naccarella Melbourne School of Population and Global Health
REVIEW RETURNED	22-Nov-2018

GENERAL COMMENTS	<p>Overall the study protocol is very comprehensive and will contribute to evidence policy, practice decision and future research re: hospital redevelopment ripple effects.</p> <p>The chosen research design, research domains, methods and data analyses complement and align well with the study aims.</p> <p>The study strengths and limitations are made explicit.</p> <p>Overall we recommend publication of an extremely important study area with significant potential to influence hospital policy, practices and research.</p>
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REVIEWER	Katarzyna Dubas-Jakóbczyk Institute of Public Health, Jagiellonian University Medical College, Krakow, Poland
REVIEW RETURNED	11-Jan-2019

GENERAL COMMENTS	<p>Overall, the protocol is well developed and presents an innovative approach, yet providing more details might increase its value. As with any other study – describing the context of the researched item/population might be helpful with the results transferability to the other settings - thus is should planned at the protocol stage.</p> <p>A few suggestions are below:</p> <ul style="list-style-type: none"> • In the Methods section: timeframe of the study should be defined - the dates of the redevelopment – when the wards were/are to be moved and outcomes measurement were/is to take place. • In the Methods section: Study setting - more details on the analyzed hospital (e.g. average number of beds; wards; staff employed) might be provided to give reader some perspective. In the same subsection the redevelopments projects should be described in more detail: which of the 4 wards specialties constitute the intervention vs. control group; was the redevelopment related only to moving location or did it also include e.g. buying new equipment; installing new software; changing the organizational structure; changing beds/staff capacity? Also some additional justification for the choice of control group wards might be provided (more than just 'discussion with hospital executives') - maybe some basic statistics comparison/ volume capacity? • In the Methods section: Study procedures – Patients experience survey – even though an existing online survey is to be used – additional information might be added: was the questionnaire validated? what is the usual response rate? • In the Methods section: Study procedures – Hospital-wide survey staff – as the existing tool is to be used – what is the usual response rate? • In the Methods section: Study procedures – Semi structured interviews – how many interviews are planned (by ward and staff category)? Are the interviews to be conducted face-to-face or via phone. Who will be the interviewer? <p>Additional comment:</p> <ul style="list-style-type: none"> • In the Background, sections some elements of change management theory might be mentioned.
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VERSION 1 – AUTHOR RESPONSE

Reviewer	Comment	Response
2	#1 Interesting study protocol. This would be a an even more interesting study if conducted in more than one hospitals.	We thank the reviewer for this comment. We agree that this area of research would benefit from a multi-site exploration comparison of the effects of hospital redevelopment and will keep this in mind for the development of future research projects.
3	My only concern is that another limitation of the study is not mentioned: the decision which wards are moved into the new building and therefore renovated is not a random decision. This introduces a major selection bias which has not been mentioned by the authors. This limits the generalisability of the study results even further.	Thank you for raising this point. We have added this limitation to the discussion section (pg. 10).
5	In my opinion, this is more of a demonstration project rather than an elaborate study as sold to the reader. A more careful presentation is warranted	Thank you for raising this point. Please note that while only one site is involved, the use of multiple methods and a longitudinal design indicate that our study is fairly sophisticated in its approach. Therefore, while findings may not be generalisable, our study will offer theoretical insights from understanding the process of change and how it can impact staff and their interactions, as well as use and integrate a mix of innovative methods. Nevertheless, in response to this reviewer's suggestion, we have revised some of the wording in the paper, particularly in the discussion.
6	#2 Overall the study protocol is very comprehensive and will contribute to evidence policy, practice decision and future research re: hospital redevelopment ripple effects. The chosen research design, research domains, methods and data analyses complement and align well with the study aims. The study strengths and limitations are made explicit. Overall we recommend publication of an extremely important study area with significant potential to influence hospital policy, practices and research.	Thank you for this positive assessment of our manuscript.

7	#3	Overall, the protocol is well developed and presents an innovative approach, yet providing more details might increase its value. As with any other study – describing the context of the researched item/population might be helpful with the results transferability to the other settings - thus is should planned at the protocol stage. A few suggestions are below:	Thank you for your support and comments. We have added greater detail on the research setting (pg. 6). We have addressed your additional feedback below.
		• In the Methods section: timeframe of the study should be defined - the dates of the redevelopment – when the wards were/are to be moved and outcomes measurement were/is to take place.	The date of the redevelopment has been added to the manuscript (pg. 6). The timeframe of outcome measurement cannot be guaranteed. As in any change project, there is a degree of uncertainty and unpredictability of when infrastructure and resources will be ready. To mitigate this challenge, we state in this manuscript when (before and/or after) and at how many timepoints data will be collected.
11		• In the Methods section: Study setting - more details on the analyzed hospital (e.g. average number of beds; wards; staff employed) might be provided to give reader some perspective. In the same subsection the redevelopments projects should be described in more detail: which of the 4 wards specialties constitute the intervention vs. control group; was the redevelopment related only to moving location or did it also include e.g. buying new equipment; installing new software; changing the organizational structure; changing beds/staff capacity? Also some additional justification for the choice of control group wards might be provided (more than just ‘discussion with hospital executives’) - maybe some basic statistics comparison/ volume capacity?	Thank you for this point. We have elaborated in the methods section as suggested (pg. 6). Our level of detail of the hospital and wards is in accordance with the ethical constraints of the approval of this study; we cannot divulge the identity of the hospital.
		• In the Methods section: Study procedures – Patients experience survey – even though an existing online survey is to be used – additional information might be added: was the questionnaire validated? what is the usual response rate?.	We thank the reviewer for raising this point. While the usual response rate of the patient experience survey is not known for this hospital, a validated questionnaire will be used and has been outlined in the manuscript accordingly.
		• In the Methods section: Study procedures – Hospital-wide survey staff – as the existing tool is to be used – what is the usual response rate?	Thank you for this suggestion, we have included the most recent response rate.
		• In the Methods section: Study procedures – Semi structured interviews – how many	This has been added.

	interviews are planned (by ward and staff category)? Are the interviews to be conducted face-to-face or via phone. Who will be the interviewer?	
	Additional comment: • In the Background, sections some elements of change management theory might be mentioned	Thank you for this suggestion, we have included this information accordingly.

VERSION 2 – REVIEW

REVIEWER	Katarzyna Dubas-Jakóbczyk Institute of Public Health Jagiellonian University Medical College, Krakow, Poland
REVIEW RETURNED	18-Feb-2019

GENERAL COMMENTS	Thank you for addressing my comments. I look forward to reading the results of this project!
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REVIEWER	Lucio Naccarella Melbourne School of Population and Global Health
REVIEW RETURNED	11-Mar-2019

GENERAL COMMENTS	<p>Overall the focus of the manuscript is worthy - as hospital redevelopment has far reaching implications. However, the manuscript / protocol has inadequacies in the following areas that require addressing:</p> <ul style="list-style-type: none"> - conceptually the hospital work environment is not sufficiently recognised ie its complexity and dynamic nature due to its physical built environment; social environment and cultural environment need further in depth consideration - while the author suggest conducting a pragmatic, longitudinal mixed methods study, and the of six methods, further consideration could be given to using existing instruments eg the Perceived Hospital Environmental Quality Perceptions Instrument. - the six outlined domains require further definition and explanation ie is it unclear where the six domain came from and what does 'Organisational culture or Efficiency' refer to? - the focus on Ripple effects is important - however, more explanations are required with regard to how ripple effects are being conceptualised - as ripples can refer to both actions (outputs) or to outcomes (changes) - more consideration is required with regard to who (ie Hospital staff) will be surveyed, interviewed and observed - as nurses, managers, specialists will have diverse views - the authors say " we know little about the role hospital env in supporting or restricting collab ways of working" - we disagree - the authors should be made aware of " 1. Naccarella, L; Raggatt, M; Redley, B. (2018). The Influence of Spatial Design on Team Communication in Hospital Emergency Departments. Health Environments Research & Design Journal 1-16 and other existing literature e.g., Becker, F., & Parsons, K. S. (2007). Hospital facilities and the role of evidence-based design. Journal of Facilities Management, 5, 263–274. doi:10.1108/1472596071082259; Becker, F. (2007a). Nursing unit design and communication patterns: What is “real” work? Health Environments
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	<p>Research & Design Journal, 1, 58–62. doi: 10.1177/193758670700100115; Ampt, A., Harris, P., & Maxwell, M. (2008). The health impacts of the design of hospital facilities on patient recovery and wellbeing, and staff wellbeing: A review of the literature. Sydney. Retrieved from http://hiaconnect.edu.au/old/files/Hospital_Design_Review.pdf; Slade, D., Manidis, M., McGregor, J., Scheeres, H., Chandler, E., Stein-Parbury, J., . . . Matthiessen, C. M. (2015). Communicating in hospital emergency departments. Heidelberg, Germany: Springer.</p>
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VERSION 2 – AUTHOR RESPONSE

	Reviewer	Comment	Response
1	#3	Thank you for addressing my comments. I look forward to reading the results of this project!	We thank the reviewer for their guidance in improving this manuscript.
1	#2	Overall the focus of the manuscript is worthy - as hospital redevelopment has far reaching implications.	Thank you for this assessment.
2	#2	However, the manuscript / protocol has inadequacies in the following areas that require addressing: - conceptually the hospital work environment is not sufficiently recognised ie its complexity and dynamic nature due to its physical built environment; social environment and cultural environment need further in depth consideration	Thank you for raising this point. We have added greater detail as to the complexity of changing the hospital infrastructure beyond the physical built environment; taking into account the social, organisational and cultural environment (Pg. 3).
3		- while the author suggest conducting a pragmatic, longitudinal mixed methods study, and the of six methods, further consideration could be given to using existing instruments eg the Perceived Hospital Environmental Quality Perceptions Instrument.	Thank you for this suggestion. We have revised our methods to include existing validated instruments, including: Readiness for Organisational Change instrument and Maslach's Burnout Inventory (Pg. 8).
4		- the six outlined domains require further definition and explanation ie is it unclear where the six domain came from and what does 'Organisational culture or Efficiency' refer to?	Thank you for this point. We have added brief explanations as to what we mean by organisational culture and efficiency and explained that these domains were crafted in review of the literature (Pg. 5, 7, 8).

5		<p>- the focus on Ripple effects is important - however, more explanations are required with regard to how ripple effects are being conceptualised - as ripples can refer to both actions (outputs) or to outcomes (changes)</p>	<p>We agree with the reviewer that the focus on ripple effects is important and thank them for raising this point. We have amended the manuscript to include an example of how ripple effects are conceptualised (Pg. 3-4.</p>
6		<p>- more consideration is required with regard to who (ie Hospital staff) will be surveyed, interviewed and observed - as nurses, managers, specialists will have diverse views</p>	<p>We acknowledge that 'hospital staff' is a broad and inclusive term that includes various health care professionals (nurses, specialists), as well as non-clinical staff (managers, cleaners). The reason for this is to capture the broad experiences and any unintended influences the redevelopment may have on different professional groups (Pg.8).</p> <p>We have now specified throughout the manuscript that all hospital staff are invited as participants in the survey, interviews, and observations.</p>
7		<p>- the authors say " we know little about the role hospital env in supporting or restricting collab ways of working" - we disagree - the authors should be made aware of "</p> <p>1. Naccarella, L; Raggatt, M; Redley, B. (2018). The Influence of Spatial Design on Team Communication in Hospital Emergency Departments. Health Environments Research & Design Journal 1-16</p> <p>and other existing literature e.g., Becker, F., & Parsons, K. S. (2007). Hospital facilities and the role of evidence-based design. Journal of Facilities Management, 5, 263–274. doi:10.1108/1472596071082259;</p> <p>Becker, F. (2007a). Nursing unit design and communication patterns: What is "real" work? Health Environments Research & Design Journal, 1, 58–62. doi: 10.1177/193758670700100115;</p> <p>Ampt, A., Harris, P., & Maxwell, M. (2008). The health impacts of the design of hospital facilities on</p>	<p>We thank the reviewer for raising this point. We have reviewed the example papers provided as well as the literature more broadly to amend this section of the manuscript (Pg. 3).</p>

	<p>patient recovery and wellbeing, and staff wellbeing: A review of the literature. Sydney. Retrieved from http://hiaconnect.edu.au/old/files/Hospital_Design_Review.pdf;</p> <p>Slade, D., Manidis, M., McGregor, J., Scheeres, H., Chandler, E., Stein-Parbury, J., . . . Matthiessen, C. M. (2015). Communicating in hospital emergency departments. Heidelberg, Germany: Springer.</p>	
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