Reviewer's report

Title: Do cognitive aids reduce error rates in resuscitation team performance? Trial of Emergency Medicine Protocols In Simulation Training (TEMPIST) in Australia.

Version: 1 Date: 02 Dec 2019

Reviewer: Margaret Murphy

Reviewer's report:

Thank you for the opportunity to review this interesting article on the use of cognitive aids in resuscitation. The aim of the study was to describe the process of developing a cognitive aid, which included standardised protocols. The objective of the cognitive aid was to allow easy, real time access to resuscitation algorithms and to measure the impact of this on errors rates in team performance.

Overall I found the paper to be clear and well presented. To recommend this paper for publication, the following points need to be addressed:

Title and abstract: The title indicates the study's design and the abstract mostly provided an informative summary of what was done and what was found. I would however question one component of the title which is 'Do cognitive aids reduce error rates in team performance' I think a more accurate title is 'Do cognitive aids reduce error rates in resuscitation? Trial of Emergency Medicine Protocols In Simulation Training (TEMPIST) in Australia. Line 21 states 'Each team was measured on 60 key processes'. Are these processes or critical decision nodes?. Line 47 - 'The statement: 'The handbook improves human performance and enables healthcare workers to improve their own conduct within a team setting' is not an informative summary of what was found. The outcomes measured were clinical measures or endpoints and the usefulness of the handbook, not team performance measures (team communication, team leadership etc).

Background:

The background and rationale for the use of cognitive aids in resuscitation is clearly articulated. There needs to be some language correction around the Line 14 'Emergency room clinicians........'.

Line 22 Page 4; Remove the word "'almost' from this sentence

Line 36 Page 4; It might also be important to emphasis that resus situations are time critical and that it is not practical for staff to find and digest complicated protocols.

The third paragraph discusses the role of Crisis Resource Management training in aviation and how failure in human performance was linked to airline crashes. Non technical skills training was identified as an intervention to assist anaesthetic crisis. However this study is not about
training in non technical skills; it is about the introduction of a cognitive aid. Hence a link between CRM and the role of cognitive aids in crisis management needs to be further expanded on here.

The section is also missing a definition of cognitive aids. There is not consistency in the use of cognitive aids versus checklists. This needs further clarification for readers.

Line 1 Page 5; Needs to expand on the sentence 'Every team performed better when using the cognitive aids - with a reference'. Explain why this happened. I would also suggest linking it to the principle of standardisation of care, removing variation.

Line 20 Page 5 refers to current guidelines: Which guidelines are you referring to and include a reference here?

Participants and recruitment

It would be helpful to expand on the training and qualifications (tertiary qual and if they had completed ALS training) of the participants.

Some context around the characteristics of the E.D and the number of ATS 1 patients treated at the study site would enhance this paper.

Please provide the Human Research Ethics Committee reference No.

Random allocation

Line 33 page 7: There needs to be some language correction around the Line 33 "There are a lot of .........'.

Intervention

Line 60 page 7 There needs to be some language correction around the Line 60 "The content of the current protocols .........'.

With regard to the algorithms, it would be helpful to describe the key consistent features of the algorithms (i.e where they on a single page, minimum explanatory text, were they in the format of a flow diagram with readily identifiable critical decision nodes) and if they were validated by other stakeholders.

It would also be important to know if these cognitive aids described diagnostic and management steps from the initial reception of a patient to when? (i.e disposition, radiology, OT etc)
The paragraph referring to 'usual care' states that without the handbook, teams relied on memory of usual care. I think this would be more accurately articulated as ' Without the handbook, clinicians largely determined resuscitation care and relied on memory of usual care'.

Outcomes

Explain how the questionnaire was developed. Did you use an implementations science framework i.e Theoretical domains framework, or Behavioural Change Wheel, to guide the content of the questionnaire.

Explain the rationale for no debriefing until after the questionnaire was completed and submitted

Results

Line 17 page 10 you refer to '1260 key tasks'. But are these just task or actually reflect cognitive activities, steps or decision nodes.

Line 24 page 10 There needs to be some language correction around the Line 23 ' While males.............'

Discussion

Line 21, page14 you refer to mandatory training requirement -Please explain what you mean here

You state that certification in ALS is a requirement for clinical staff in Australasian E.D.s Please reference this statement

Explain the statement on page 15, Lines 12-17

In the discussion there is a mixture of terminology used i.e checklist versus cognitive aid. Please standardised what terminology you want to use in your manuscript

Line 58, page 15 states that before this study the cognitive aid was informally tested in simulation - please include this in the background section

Explained how consensus was reached with the 2 reviewers independently each scenario. This should be included in the analysis section

On page 17, line 7 you refer to the intoxication cases. What scenario is this?

On page 17, line 28 needs some language correction
I don’t believe that you can make the statement 'Human performance training will transform how medical care is delivered'

General comments

I think this manuscript needs to discuss standardised practice and the fact it results in less variation, thereby reducing errors and improving outcomes. This has to be the starting point for this project as optimal resuscitation care is achieved through standardisation, as evidence by ALS approach. The challenge is how does one promulgate standardised processes. This research project suggests it is by using a handbook of purposely designed algorithms which suit the emergency situation. However, in today's world digital health technology must also be considered. You mention why IT solutions have limitations in your setting but I think this warrants further discussion. The paper failed to convince me that this handbook is any different to the clinical protocols that are found lying around in many departments. You made the point that they were not overly comprehensive or bureaucratically protracted. What I believe is missing is the Implementation Science piece. The assumptions that this handbook will lead to practice change is at best an optimistic aspiration. Rather, pairing this research project with implementation strategies (how staff will use it, how they will use it, why they will use it, what barriers exit, what will enable its use in clinical practice etc would help to convince the reader if these outcomes are to make good on their promise.

Level of interest
Please indicate how interesting you found the manuscript:

An article of importance in its field

Quality of written English
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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