Pre-simulation preparation and briefing practices for healthcare professionals and students: a systematic review protocol

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Review question/objective: The objective of this review is to systematically examine the use and effectiveness of pre-simulation preparation and briefing practices for healthcare professionals and students. More specifically, the objectives are to identify characteristics/activities of pre-simulation preparation and briefing and their effects on knowledge, attitudes, self-confidence, self-efficacy, anxiety and skill performance in healthcare professionals and students.

The review question is: What are the characteristics/activities of effective pre-simulation preparation and briefing?

Keywords Brief; facilitation; orientation; pre-scenario; simulation

Background

Interest in the use of simulation for teaching and learning in academic and practice settings is mounting. Simulation is currently used for a wide range of purposes, including as a replacement for clinical hours,1,2 as an adjunct to clinical hours,3 for specialty experiences, such as those with a pediatric or maternal child focus,4 for competency assessment,5,6 for crisis resource management or team training,7 and for inter-professional education.8,9

As educational programs integrate simulation experiences in an effort to meet the healthcare quality and patient safety agenda, simulation design becomes preeminent. Simulation experiences involve three main dimensions: pre-briefing, unfolding the scenario and debriefing.10,11 Although concepts, approaches and techniques associated with scenario development and debriefing are widely reported in the literature, there is little discussion of pre-briefing or briefing practices,12–14 and how these practices contribute to the simulation experience. It has been suggested that pre-briefing is a critical element in scenario design and learner engagement,10,15 yet is underreported in the literature. The aim of this systematic review is to address the characteristics/activities of effective pre-simulation preparation and briefing.

In defining the term briefing or pre-briefing, two main themes emerged from the literature. First, pre-briefing is used to describe “information or an orientation session held prior to the start of a simulation-based learning experience in which instructions or preparatory information is given to the participants.”16(p.S6) Activities supported during the pre-briefing include review of the learning objectives, orientation to the learning environment, and overview of learner roles and expectations.14,16 During this phase, clarifying learner expectations and assisting the learner in the suspension of disbelief is important in fostering learner engagement during the simulation experience.14 These activities are completed just prior to the simulation experience to facilitate achievement of the learning objectives.16 Clear and explicit instruction provided in advance of the scenario was found to be beneficial to improving learner performance during the simulation encounter.15

The term pre-briefing has also been used to describe additional preparatory activities to augment simulation-based learning. The learner preparation may include completion of a web-based module or independent reading assigned in advance of the simulation.17–19 Pre-simulation preparation...
may also include a list of essential skills that are to be mastered by the learner prior to attending the simulation experience. Other strategies for pre-simulation preparatory work include creating cognitive aids such as cue cards or concept maps to be used during the simulation scenario as a quick reference. Pre-simulation preparation can be guided by learning outcomes and descriptors provided by assessment rubrics, which may help learners to close the gap between their actual and desired performance. Attendance at additional laboratory practice sessions designed to refine psychomotor skills could also be included in pre-simulation preparation.

Discussion continues when determining the correct dose and types of pre-simulation activity. Gantt suggests that simulation-based learning experiences are associated with a physiologic stress response, yet too much stress can inhibit the learning process leaving the learner unable to perform during the simulation. When learners experience a level of comfort in the environment as a result of orientation and prior exposure to the simulation scenario, the anxiety associated with the simulation experience has been shown to be lessened. Decreasing anxiety promotes student engagement during simulation experiences, which in turn supports critical thinking and reflective practice.

The degree to which learners should optimally be provided with cues during the simulation remains in question. Sharoff provided the learners with comprehensive preparatory materials, which could be viewed as providing a high level of cueing. Depending on the formative or summative nature of the assessment, it may or may not be appropriate to cue the learner. Gantt notes a lack of evidence to recommend the actual components of preparation for simulation-based learning. Although lectures, readings, videos and web-based materials are common methods of preparing learners, there is a lack of evidence to favor one method over another. Additionally, evidence points to variations in the amount of assigned pre-simulation preparation that is actually completed by learners prior to attending the simulation experience. Further, while learners may be assigned preparatory materials, there is no verification of review and understanding of this information.

For the purpose of this review, we maintain that simulation experiences involve three learning stages: preparation, participation and debriefing, and that the preparation stage includes the pre-briefing or briefing, which occurs immediately prior to participation in the scenario. To guide this review, it is necessary to define the key terms:

Pre-simulation preparation is the content or material provided at unspecified times in advance of the simulation experience. Broadly, this includes course-related content in any format shared with the learner in advance of the scenario, to optimize the learning. Traditionally, lecture or other preparatory work such as assigned readings are considered pre-simulation activities. Additionally, methods of self-assessment such as pre-simulation quizzes, self-reflections, assessment rubrics or other evaluations completed by the learner to identify knowledge or skill gaps in advance of the simulation experience may be considered pre-simulation preparation activities.

Pre-briefing and briefing are used synonymously to indicate the interaction between the facilitator and the learner, just prior to the simulation experience. During this interaction, the learner is prepared to fully engage in the learning environment. Considered a more active experience, the facilitator may review the learning objectives, provide equipment orientation and share other pertinent information relevant to the specific simulation experience.

As the science of simulation continues to evolve, emphasis previously placed largely on scenario development and debriefing must now expand to other components of the learning experience. As the focus shifts to other key elements of simulation design, greater interest is directed toward pre-simulation preparation and pre-briefing practices and how these contribute to the simulation experience and learning. Yet few literature reviews have been completed on this topic.

A search of the JBI Database of Systematic Reviews and Implementation Reports, Cochrane Database of Systematic Reviews, Medline, the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Epistemonikos found no existing systematic reviews completed or proposed on pre-simulation preparation. However, Page-Cutrara completed a comprehensive review in 2014 specifically on pre-briefing of nursing literature only. The review included 15 articles, and reported that the role of pre-briefing may be beneficial in developing critical thinking and clinical judgment. Chamberlain performed a concept analysis in 2015.
of pre-briefing in nursing simulation in which she reported the results of a review conducted using a single database, CINAHL. After review of 23 articles, it was recommended that pre-briefing be conducted by faculty educated in the use of simulation to enhance learner engagement and effectiveness of the simulation experience. To expand on the existing work on this topic, our review will examine all pre-simulation preparation activities, including pre-briefing in all health professionals and health professional students.

For this review, outcome measures for quality simulation experiences include knowledge, attitudes, self-efficacy and self-confidence. A variety of tools exist such as the Simulation Evaluation Tool, which has been used to examine student satisfaction and self-confidence while engaging in simulation. In many studies, student satisfaction and self-confidence were measured, revealing most students enjoyed the active learning that occurs in simulation. Confidence, most often assessed as single-item measure on a questionnaire, increased after most simulated learning experiences.

Increased self-confidence can lead to enhanced performance and competency, which results in an increased self-efficacy enhancing performance through affective, cognitive and motivational processes.

For the purposes of this appraisal, any activity that is completed in preparation of a simulation experience will be included for review. Concepts related to pre-simulation preparation and pre-briefing practices will be explored within the context of healthcare professional’s education. As more emphasis is placed on simulation-based learning experiences for healthcare students and professionals, a closer examination of the role of pre-simulation preparation and pre-briefing practices is warranted, specifically including a focus on how they contribute to the learning process.

**Inclusion criteria**

**Types of participants**

This quantitative review will consider studies from any setting that include any health professionals and/or health professional students participating in simulation. Simulation may include medium fidelity, hybrid simulations or high-fidelity simulations using computerized manikins or standardized patients.

**Types of intervention(s)/phenomena of interest**

The review will consider studies that evaluate characteristics/activities of pre-simulation preparation and/or pre-simulation briefing (or pre-briefing). Comparators may include traditional lecture preparation, alternate preparation or briefing, or no preparation and/or briefing activities.

**Outcomes**

This review will consider studies that include any of the following learner outcome measures: knowledge, attitudes, self-confidence, self-efficacy, anxiety and skill performance. A variety of measures are implemented to evaluate simulation-based learning activities. Competency-based checklists, rubrics and scales are used in the evaluation of simulation-based learning outcome measures. Instruments used in the studies for this review range from researcher developed tools to well-validated and reliable instruments.

**Types of studies**

This review will consider both experimental and epidemiological study designs, including randomized controlled trials, non-randomized controlled trials, quasi-experimental, before and after studies, prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies.

The review will also consider descriptive epidemiological study designs, including case series, individual case reports and descriptive cross-sectional studies.

**Search strategy**

The search strategy aims to find both published and unpublished studies. A three-step search strategy will be utilized in this review. An initial limited search of MEDLINE and CINAHL will be undertaken followed by analysis of the text words contained in the title and abstract and the index terms used to describe the article. A second search using all identified keywords and index terms will then be undertaken across all included databases. Third, the reference list of all identified reports and articles will be searched for additional studies. No language limitation will be placed on the search strategy. Research studies published in languages other than English will be tallied and reported. To be thorough, no date limit will be placed on the search strategy.
The databases to be searched include: Medline, CINAHL, PsycINFO, ERIC, Web of Science, and Cochrane Central Register of Controlled Trials.

The search for unpublished studies will include: Dissertation Abstracts, Google, and selected grey literature databases/gateways (e.g. OpenGrey, Grey Literature Report, Grey Source).

Initial keywords to be used will be: simulation, prebrief$, brief$, prescenario, pre-scenario, presimulation, presimulation, pretain$, pre-train$, pre-preparation, orientation, facilitation

**Assessment of methodological quality**

Quantitative articles selected for retrieval will be assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardized critical appraisal instruments from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) ( Appendix I). Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer.

**Data extraction**

Quantitative data will be extracted from articles included in the review independently by two reviewers, using the standardized data extraction tool from JBI-MAStARI ( Appendix II). The data extracted will include specific details about the interventions (e.g. duration, content and method of delivery), populations, study methods and outcomes of significance to the review question and specific objectives. For missing information or to clarify unclear data, the authors of primary studies will be contacted. Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer.

**Data synthesis**

Quantitative articles will, wherever possible, be pooled in statistical meta-analysis using JBI-MAStARI. All results will be subject to double data entry. Effect sizes expressed as odds ratio (for categorical data) and weighted mean differences (for continuous data) and their 95% confidence intervals will be calculated for analysis. Heterogeneity will be assessed statistically using the standard $\chi^2$ and also explored using subgroup analyses based on the different quantitative study designs included in this review. Where statistical pooling is not possible the findings will be presented in narrative form, including tables and figures to aid in data presentation, wherever appropriate. The MAStARI critical appraisal tool will be used to evaluate the studies, blinded to each reviewer.

**References**

Appendix I: MASTARI appraisal instruments

JBI Critical Appraisal Checklist for Experimental Studies

Reviewer _________________________________ Date ____________________
Author _________________________________ Year ______

<table>
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<tr>
<th>No.</th>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Unclear</th>
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<tr>
<td>1.</td>
<td>Was the assignment to treatment groups truly random?</td>
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<td>2.</td>
<td>Were participants blinded to treatment allocation?</td>
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<td>3.</td>
<td>Was allocation to treatment groups concealed from the allocator?</td>
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<td>4.</td>
<td>Were the outcomes of people who withdrew described and included in the analysis?</td>
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<td>5.</td>
<td>Were those assessing the outcomes blind to the treatment allocation?</td>
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<td>6.</td>
<td>Were control and treatment groups comparable at entry?</td>
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<td>7.</td>
<td>Were groups treated identically other than for the named interventions?</td>
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<td>8.</td>
<td>Were outcomes measured in the same way for all groups?</td>
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<td>9.</td>
<td>Were outcomes measured in a reliable way?</td>
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<td>10.</td>
<td>Was appropriate statistical analysis used?</td>
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Overall appraisal: Include [ ] Exclude [ ] Seek further info [ ]

Comments (including reasons for exclusion):

__________________________________________________________________

__________________________________________________________________
JBI Critical Appraisal Checklist for Comparable Cohort/ Case Control

Reviewer _________________________________ Date __________________

Author __________________________________________ Year ______

Yes No Unclear

1. Is sample representative of patients in the population as a whole?

2. Are the patients at a similar point in the course of their condition/illness?

3. Has bias been minimized in relation to selection of cases and of controls?

4. Are confounding factors identified and strategies to deal with them stated?

5. Are outcomes assessed using objective criteria?

6. Was follow up carried out over a sufficient time period?

7. Were the outcomes of people who withdrew described and included in the analysis?

8. Were outcomes measured in a reliable way?

9. Was appropriate statistical analysis used?

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (including reasons for exclusion): ____________________________________________________________

__________________________________
### JBI Critical Appraisal Checklist for Descriptive/Case Series

**Reviewer _________________________________ Date __________________**

**Author _________________________________ Year ______**

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<td>2. Were the criteria for inclusion in the sample clearly defined?</td>
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<td>3. Were confounding factors identified and strategies to deal with them stated?</td>
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<td>4. Were outcomes assessed using objective criteria?</td>
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<td>5. If comparisons are being made, was there sufficient description of the groups?</td>
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<td>6. Was follow up carried out over a sufficient time period?</td>
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<td>7. Were the outcomes of people who withdrew described and included in the analysis?</td>
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<td>8. Were outcomes measured in a reliable way?</td>
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<td>9. Was appropriate statistical analysis used?</td>
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Overall appraisal:  
- Include [ ]  
- Exclude [ ]  
- Seek further info [ ]

Comments (including reasons for exclusion):

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Appendix II: Data extraction instruments

**MAStARI data extraction instrument**

JBI Data Extraction Form for Experimental/Observational Studies

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<td>Journal</td>
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**Study Method**

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**Participants**

Setting

Population

Sample size

Intervention 1  Intervention 2  Intervention 3

**Interventions**

Intervention 1

Intervention 2

Intervention 3

**Clinical outcome measures**

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### Study results

#### Dichotomous data

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#### Continuous data

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### Authors’ Conclusions

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### Comments

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