The Impact Of Simulation On Paramedics Knowledge Of Learning Goals

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ABSTRACT

Introduction: Simulation has become a vital part in the skill development of paramedics for their further training. It is believed that practicing paramedics learn through reflecting on their practice and it is expected that simulation can also result in reflection which can in turn change the practice. Nevertheless, there is a scarcity of research regarding how these practitioners apply simulated scenarios to establish learning needs. This paper therefore seeks to simulation determine training how influences the self-identification of learning objectives among the emergency medical service workers particularly the paramedics.

Methods: The participants in this study include the paramedics (primary care and advanced care) and they were involved in a 30-minute simulated learning activity. All the participants completed pre-post surveys to identify their learning objectives by themselves at the beginning and at the end of the simulation respectively. Qualitative analysis of the data was done using the interpretive description approach, and the resulting list of themes was generated from the learning objectives. The learning objectives were classified as pre-post learning objectives and matched individually based on the level of specificity as decided by the authorship team. Basic summary statistics were computed in order to determine the frequency with which the participants' learning objectives increased or decreased in specificity, different or same.

Results: Thirty-five paramedics who took part in the simulation and completed the survey are presented in this study. The following major themes were identified in the learning objectives: 1) Assessment and diagnostic; 2) Communication and collaboration; 3) Integration of knowledge; 4) Treatment and management. The learning objectives increased in specificity after simulation in 6 (17. 1%), while 3 (8.6%) reduced in specificity, 22 (62. 9%) changed while 4 (11. 4%) did not change.

Conclusion: Simulation training has the potential of enhancing the understanding of the needs that are thought to be lacking Simulation experiences can be useful in helping identify learning needs and gaps that exist before and after the simulation. This could assist the educators to comprehend how to guide reflection and improve the participation of the paramedics in simulation exercises.

KEYWORDS: paramedicine, paramedic education, learning.

1. INTRODUCTION

CPD is one of the most important concepts of lifelong learning which healthcare professionals are supposed to undergo. CPD enables the growth of knowledge and skills of the practitioners in order to enhance clinical performance and patient results. However, the current state of CPD is that it is mainly made up of didactic lectures which have been proved to be ineffectual in bringing about practice changes [1].

Methods that involve interaction have been found to be more effective in facilitating learning than the didactic approach [2-3]. Other interventions like clinical may practice be feedback seen has as been unsafe previously or resisted a as threat feedback [4]. on Therefore, real it life is cases important to know what kind of CME tools are best to support the acquisition of knowledge and its transfer into clinical practice.

The use of simulation has emerged as a valuable tool in the continued medical training of paramedics and remains a widespread topic of research contributing to CME improvement [5,6-10]. Simulation is often considered a 'safe space' in which professionals or trainees can seek to maintain their skills [11-12]. In particular, simulation-based training has been specifically recommended for training in emergency medicine [13] or paramedicine [5]. Simulation-based learning environments provide learners with opportunities to practice their skills and develop clinical confidence in a controlled environment [14]. In simulation scenarios where the cases and goals are known in advance, participants are encouraged to set objectives as a guiding tool to determine if their learning goals have been achieved following the completion of the simulation experience [15]. Simulation, along with the subsequent debriefing and feedback, is rooted in the learning theories of experiential learning and self-reflection. Effective simulation activities are designed from the ground up to promote self reflection. Simulation, therefore, provides a fertile ground for stimulating self-reflection and guided improvement.

Despite the prevalence of simulation in continuing education, there is limited research on how simulated experiences affect the setting of learning objectives and goals. The primary aim of this study was to determine if short simulated experiences could prompt paramedics to modify their self-identified learning objectives. The secondary aim of this study was to identify common themes in the learning objectives set out by paramedics participating in simulated experiences.

2. MATERIALS AND METHODS

Participants

The participants of this research consisted of the EMS providers who were undergoing simulation training in the context of a Umm Alqura University Annual Practice Review (APR) course. This APR course is an annual practice review and all the participants have previously been exposed to simulation or have been a paramedic trainee. All the participants were volunteers and written informed consent was obtained from each of the participants.

Study design

All participants completed a two-part survey as part of this study. A baseline pre- simulation survey was administered immediately prior to the simulation training, and a post-simulation survey was given immediately following the simulation training. The pre-simulation survey was completed while the participant paramedics were awaiting their annual simulation training event. This pre-simulation survey included questions regarding participant demographics, self-assessment of perceived knowledge/skills, and self-identification of

learning objectives pertaining to the targeted simulation training scenario. The post-simulation survey consisted of the same questions as the pre-simulation survey, with additional questions to determine if they felt their own learning objectives were achieved after completing the simulation training.

Data analysis

Survey responses were de-identified then recorded onto a Microsoft Excel spreadsheet. De-identified survey responses were reviewed by the investigatory team members (TC, EJ) to identify themes in the participants' learning objectives. Based on the theme of each learning objective from pre-simulation to post-simulation, participants were categorized into one of four groups describing the change in specificity of the learning objectives: "more specific", "less specific", "same" or "different". Learning objectives were considered to have become "more specific" if the post-simulation learning objectives themes remained the same as the pre- simulation, but modified with more granular descriptions (e.g., talked about a smaller portion of a broader topic). Learning objectives were considered to have become less specific if the post-simulation learning objectives themes remained the same as the pre-simulation, but modified with more general descriptions or specifications. Learning objectives were considered to be "same" if post-simulation learning objectives remained unchanged from the pre-simulation learning objectives. If the post-simulation learning objectives themes were different than the pre- simulation learning objectives, they were classified under "different". Simple descriptive statistics were used to describe the participant demographics and the changes in participants' learning objectives from pre-simulation to post-simulation.

3. RESULTS

A total of 44 paramedics participated in the simulation training. Nine participants did not complete the survey and were lost to follow-up, resulting in a study sample of 35. The demographics of the study participants are described in Table 1.

Table 1: Demographics of the participants SD = Standard deviation

Demographic	Value
Mean age	36.8
Gender %	59
Level of	ACP (10).pcp
Meam number of year	10.7
Mean number of year of simulation traning	10.7

There were four major themes that were identified in the learning objectives, which included assessment and diagnostic, communication and collaboration, integration of knowledge, and treatment and management. The frequency of each theme in the pre and post-simulation learning objectives is reported in Table 2.

Table 2: Major themes identified in pre and post-simulation learning objectives reported by paramedics

	Overall frequency out of 35 respondents (%)		**Example Quotes**
Theme	Pre-simulati	Post-simulatio	

	on	n	
Assessment and Diagnostic	34.3 (12)	42.9 (15)	"Familiarization with patient presentation, learning algorithms, and drug dosages." "Doing a thorough assessment of patient medications and how they contribute to illness or injury."
Communication and Collaboration	8.6 (3)	8.6 (3)	"[Participate in] interactive group learning review." "Better teamwork."
Integration of Knowledge	42.9 (15)	28.6 (10)	"Practice in a controlled environment of information reviewed today." "To practice skills and [improve] comfort level."
Treatment and Management	14.3 (5)	20 (7)	"Recognition of med overdose, hyperkalemia treatment, and management of the altered patient." "Management of trauma in the elderly and management of unstable patients."

After the completion of the simulated training, 63% of the learning objectives became "different", 17% became "more specific", 11% became "less specific", and 9% remained the same. The changes in the specificity of learning objectives from pre to post-simulation is shown in Figure 1.

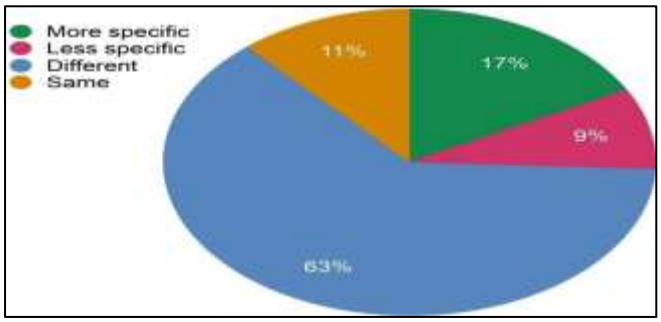

FIGURE 1: Changes in learning objectives from pre-simulation to post- simulation

4. DISCUSSION

This paper also identifies how simulation is now being used more often by paramedics and emergency medicine trainees between to the keep didactic up and and the increase practice their environment skills. and As involves a the method learner of in simulation, cognitive, simulation behavioral serves and to emotional the levels. Link.

In this study, we aimed to explore how simulation training influences the perception of learners' learning objectives in EMS providers. Of the participants, 89% stated that they altered or expanded their learning objectives during the course of a simulated learning activity as evidenced by the shift in the learning objectives towards being more specific, less specific or different. This implies that the simulation training helped to evoke self-reflection.

Also, a change in the specificity of learning objective from pre-simulation to post-

simulation was noticed in 63 % of the participants. One many change possible in of the reason the the learners self-assessment for learning participants to as this objective set be evidenced distinguish acted result theme. irrelevant self-reflective in the appropriate out. the could In or but the dominant To learning simulated to be general, unrealistic also literature categories this objectives scenario. change (15). the this learning [16]. highlight of end, that In the In and fact implies objectives the learning the are simulation, previous this diagnostic; 4) that that prior limited objectives participants relevant all learning particular 2) treatment theme not The to capability that of to objectives the research, communication and and only secondary the of the the the identified in the participants and management. it simulation integration does object simulation the paramedics simulation competencies as order major generate collaboration;
involved training, of the of training professionals set training that substantial the to themes data 3)
42. knowledge the assessment, simulation this and to for are the number second make identified integration about Before 9% (28. most diagnosis training study expected therefore make of themselves most them participants in of themselves the frequent of and 6%) make was to there accurate participants before more common want the knowledge; simulation learning management to was the to state was used relevant and theme to learning and training, objective of give the participants, and a the after for enhance objectives by the the was feedback second define while simulation the before the were: 34. integration the patient. to most the training the further they scenario identified 1) 3% of assessment But others frequent. experience assessment learning go was some assessment of knowledge and it and This and processes to through gaps the was diagnostic may may diagnostic primarily in participants. the (42. be suggest was work their After most 9%) the on that knowledge the frequent while case how a that competency made that to them during integrate reconsider the knowledge their simulation rather goals they than and ones. on objectives of the simulation and state new
Findings from this study show promise that simulation training can provide paramedics with improved guidance for self-assessment as well as transfer of learned skills to practice. Learners should be aware that learning objectives identified before simulation training may change post-simulation. Studies show that simulation participants who were better at assessing their own learning were able to retain more information post-simulation and ultimately better equipped to transfer what they learned into another representation [17-18]. Participants should ensure that they use simulation to identify new gaps in their knowledge and understanding.
For educators facilitating simulation training sessions, they should encourage participants to actively reflect by setting learning goals both before and after simulation experiences. Educators may also consider facilitating debriefing sessions to help guide goal setting. Doing so would encourage commitment to change in learners, as suggested in prior studies in the CPD and CME literature [17-18]. It may also be beneficial for simulation curriculum designers to consider how they might cycle back to these post-simulation objectives. Effective curricular integration via targeted spaced repetition [19] may allow simulation educators to harness the true power of simulation for mastery learning [20]. Educators could use the refined, post-
simulation learning objectives to redefine the next simulation objective with that same participant. This type of educational practice might help with converting one- off simulations into a form of continuously, personal quality improvement.

5. CONCLUSIONS

This study also found that simulation can be effective in supporting objective setting for practicing paramedics if integrated into a continuing professional development activity. The results of our study indicate that the goal setting and identification of simulation can be a useful method of identifying goals for practice change. Further research is needed to determine whether the objectives set by the participants during the debriefing session or by the educators during the training are more likely to result in actual practice change. Educators should also think about the number of debriefing sessions that they are providing to the learners as well as making sure that the learners are aware of the importance of setting their learning goals so that they will be motivated to make changes.

Additional Information Disclosures

Human subjects: Consent was obtained or waived by all participants in this study.. We received research ethics approval (2015-0276- GRA) for this study. Conflicts of interest: In compliance with the ICMJE uniform disclosure form, all authors declare the following: Payment/services info: All authors have declared that no financial support was received from any organization for the submitted work. Other relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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