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Vicarious learning during Simulations: is it more effective than hands-on training?

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ABSTRACT

Objective: This study aimed to investigate whether the type of simulation-based learning (learning by doing versus vicarious learning) and the order in which these activities are carried out (learning by doing → vicarious learning versus vicarious learning → learning by doing) have any effect on the acquisition of knowledge on effective doctor–patient communication strategies.

Study Design: A descriptive study.

Place and Duration of Study: At Obstetrics & Gynecology Department, Islamic International Medical College Trust, Railways Hospital, Rawalpindi from April 2013 to June2013.

Materials and Methods: The sample consisted of 33 undergraduate medical students of 3 batches (25 female, 8 male). They participated in two separate simulation sessions, each of which was 30 minutes long and was followed by a collaborative peer feedback phase.

Results: Vicarious learning led to greater knowledge of doctor–patient communication scores than learning by doing. The order in which vicarious learning was experienced had no influence. The inclusion of an observation script also enabled significantly greater learning in students to whom this script was given compared with students who were not supported in this way, but the presence of a feedback script had no effect.

Conclusion: Students appear to learn at least as much, if not more, about doctor–patient communication by observing their peers interact with SPs as they do from interacting with SPs themselves.

Key words: *vicarious learning, hands on training, communication skills.*

Introduction

Simulations with standardized patients (SPs) have been broadly used in medical education to facilitate communication skills training.[1] With respect to knowledge of doctor–patient interactions, such training is usually targeted at two main areas[2] process-centred knowledge e.g. communication during emergency situations, teamwork[3] and patient-centred knowledge e.g. history taking, breaking bad news, doctor–patient communication in the context of a physical examination.[4] Usually it is expected that knowledge acquisition in these areas occurs through learning by doing.[5] Learners apply their current knowledge to understand and act in a situation. If the activities lead to success, the probability of the application of the activated knowledge in future similar situations should be increased. If the resulting behavior leads to failure, modification of the activated knowledge may be a consequence.[6] Learners may be less likely to apply knowledge that led previously to failure in a similar situation or they may modify the applied knowledge itself. Learners, however, may also vicariously learn how to act in specific situations by observing other learners.[7,8,9] Studies have shown that not only can physical skills that are overtly modeled be learned through observation, but so can interpersonal skills such as those required for collaboration.[10] One study, argue that vicarious learning through observation requires a process of active observing.[11] If vicarious learning is supported by instructional means that facilitate active observing, skills might be acquired similarly to those acquired in learning-by-doing contexts.[10] Similarly, in another study showed that observational learning could be supported through the provision of additional collaborative peer feedback.[12]

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Materials and Methods

In a pre-post design, the order of simulation-based learning activities (learning by doing → vicarious learning versus vicarious learning → learning by doing) during a simulation of breaking bad news. A total of 33 medical students (25 female, 8 male) at Pakistan railway hospital, from April 2013 to June 2013; were randomly assigned to one of the 2 conditions. The learning sessions took place weekly during a whole clinical rotation (4 weeks). Each student had two learning sessions within 1 week of the rotation. The specific observation script and the feedback formulation script were varied randomly among weeks, but not within a single week. All students within a specific week had the same combination of scripts. All students were assigned

randomly to a specific week. The students within each specific week were randomly assigned to a specific order of simulation-based learning activities. The study was approved by IRC.

This study investigated whether the type of simulation-based learning (learning by doing versus vicarious learning) and the order of these activities (learning by doing → vicarious learning versus vicarious learning → learning by doing) affect the acquisition of knowledge related to doctor–patient communication.

The encounter was formative after the simulation (i.e. history taking and counseling), the SP provided feedback. Four female doctors volunteered to act as SPs. Each SP worked for 2 hours, which included four simulation sessions.

In a briefing session, all SPs were instructed about the reasons why the patient was seeing her doctor (intrauterine fetal demise) and were given a checklist outlining the performance expected of students. Furthermore, details of the diagnostic findings were specified. The SPs received training with special focus on the role-play and on the provision of feedback to students.

Statistical analyses used a Ancova procedure, the estimated mean (EM) and standard error (SE) are reported instead of the mean and SD. The EM and SE were computed using a mean value of knowledge at t1 of 17.58. A p-value of < 0.05 was used in all statistical tests as indicative of statistical significance. Effect sizes are reported with partial η^2.

Results

Participants ranged in age between 21 years and 24 years (mean = 22.31 years, SD = 2.76). On average, students identified a mean of 6.58 (SD = 5.81) features at t1, 3.42 (SD = 7.37) features at t2 . The reliability of the knowledge test was sufficient (Cronbach's $\alpha > 0.7$ for each time-point). Simulated patients ranged in age between 20 years and 39 years (mean = 24.31 years, SD = 2.76). The examination coders demonstrated good agreement with one another (Cohen's $\kappa = 0.93$) regarding whether or not specific aspects of good communication were mentioned by individual learners. On average, students identified a mean of 17.58 (SD = 5.81) features at t1, 20.13 (SD = 7.37) features at t2 and 18.81 (SD = 10.07) features at t3. The reliability of the knowledge test was sufficient (Cronbach's $\alpha > 0.7$ for each time-point). To examine the effects of the order of simulation-based learning activities and collaboration scripts on knowledge acquisition, we compared knowledge at t3 and controlled for prior knowledge by using t1 scores as covariate. The covariate prior knowledge explained 7% of the variance in knowledge after the second learning session ($F1,192 = 14.81$, $p < 0.001$, $\eta 2 = 0.07$).

Discussion

This study employed a collaborative learning scenario, namely scripted peer feedback, to increase the effectiveness of simulation-based learning with SPs. Its results regarding the type of simulation-based learning activity showed that vicarious learning (especially if supported by an observation script) was unexpectedly more effective than learning by doing. Whereas previous research[13] has shown that learning by doing is often superior (or at least equal) to vicarious learning, our results show that vicarious learning can even outperform learning by doing.[14]

The results of our study also provide[15]evidence that merely offering an opportunity for collaboration is often not enough to effectively facilitate knowledge acquisition through interaction (i.e. during the collaborative peer feedback phase). Learners in groups provided with the observation script acquired substantially more knowledge than learners in groups without the observation script. The observation script might enable learners to deeply elaborate the relevant aspects of the currently observed simulated session without the stress undergoing it. The more general conclusion therefore is that observers of complex simulations need to be supported with information regarding the aspects of performance on which they should focus.[16]

The larger effect of the observation script on the knowledge acquisition of observers compared with examining students might be partly explained by the fact that the observer was supported by the script during the observation and feedback phase, whereas the examiner could benefit from the script only during the peer feedback phase.

In conclusion, our study showed that simulation-based learning can be derived not only from learning by doing, but that learners can substantially benefit from observing others perform. Employing a collaborative learning scenario, namely peer feedback, clearly increases the efficiency of learning that occurs in simulations with SPs by using the simulation as a resource for vicarious learning. The benefits of learning together can be even greater when peer feedback is structured. Directing the observing learner's focus to crucial aspects of the activity of the observed peer seems more helpful than helping the peer by structuring the process through which more elaborate feedback is provided.[17]

Conclusion

Students appear to learn at least as much, if not more, about doctor–patient communication by observing their peers interact with SPs as they do from interacting with SPs themselves.

Ethical approval

This study was approved by the Riphah International University, Islamabad, Institutional Review Committee (FHMS/IRC/13/0021)

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