How Do Simulated Interviews Increase the Self-efficacy of Medical Students? - Quasi-experimental Research-

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Research Article

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Abstract

Background Self-efficacy is crucial in improving medical student communication skills. This study aims to clarify whether the self-efficacy of medical students conducting medical interviews increased after simulated interviews or after feedback discussions.

Methods A total of 162 medical students (109 men, 53 women) in their fourth or fifth year at a university in Japan participated in this study. The degree of self-efficacy in medical interviewing was measured before and after a medical interview with a simulated patient, and after the subsequent feedback session.

Results ANOVA analysis revealed that self-efficacy for medical interviews was higher after both the interview and the feedback session than before the interview. Self-efficacy was highest after the feedback session among all three time points.

Conclusions Feedback following a simulated interview with a simulated patient is important to improve the self-efficacy of medical students learning medical interviewing skills.

Background

Effective doctor-patient communication has various medical benefits. For example, effective communication can improve both patient adherence [1] and healthcare outcomes such as the reduction of pain and blood pressure [2]. To improve the communication skills of future doctors, optimizing communication education is essential in medical schools.

Medical interviews with simulated patients (SPs) constitute a mainstream tool in communication education for medical students [3]. Simulation education with SPs provides simulated medical interviews with SPs with peer-to-peer, SP, and teacher feedback [3]. These experiences promote self-reflection among students on communication skills. Receiving feedback is a useful way for students to understand themselves objectively, what they do well and what they do poorly, and how they can communicate more effectively in the next time. Such an understanding will lead to improved self-efficacy. Although a previous study showed that simulation education using SPs contributes to improving communication skills [4], comparative studies in communication education with and without SPs have not presented enough evidence to indicate that the use of SPs contributes to improving students' communication skills [5]. Therefore, it is necessary to examine how simulation education with SPs enhances communication ability.

Self-efficacy influences the occurrence of appropriate communication [6]. It refers to the recognition of one's ability to successfully perform necessary actions in a given situation [7]. High self-efficacy, may be associated with an increase in the probability of appropriate medical communication during medical interviews. An effective medical interview led by high self-efficacy may result in the improvement of patient adherence. In contrast, if self-efficacy is low, performance during the interview may be affected, and this may, in turn, affect patient adherence. Low self-efficacy will reduce patient adherence by

increasing patient anxiety and leading to a lack of understanding, as they are not effectively able to communicate in conversations about their illness and behaviour change. Thus, it is important to improve communication skills and increase self-efficacy regarding communication ability.

Few studies have examined whether self-efficacy improves as a result of simulation education with SPs. Following medical interviews with SPs, medical students who received SP feedback had both increased neurological examination scores [8] and higher self-evaluations [9] when compared to those who did not receive feedback. However, self-efficacy was not used as a measurement index in these studies.

The only study that assessed the self-efficacy of medical students was Pasold et al. [10], which was set in the context of an eating disorder scenario. The students underwent assessments both before and after a lecture on eating disorders, and before and after simulation education, which included simulated interviews with SPs and feedback sessions. While no change was observed in student self-efficacy before and after the lecture, improvements were observed after they underwent a round of simulation education. As no assessment was conducted between simulation interviews with SPs and feedback sessions, it is unclear which contributed toward the improvement. In a study by Dzulkarnain et al., while conducting a simulated interview with SPs with hearing impairments, auditory history taking skills improved in the group that received feedback from the SPs than in the group that did not [11]. In addition, Brouwers et al. reported that the students who conducted a medical interview to tell bad news perceived the feedback from doctors, SPs and peers as useful information for them [12]. Therefore, it is necessary to evaluate whether the improvement in self-efficacy is an effect of the simulated interview itself or the feedback that follows.

By clarifying this, it is possible to determine the necessity of feedback sessions following simulated interviews with SPs. If self-efficacy increases only through interviews, the need for feedback sessions will be reduced. If self-efficacy is improved by conducting a feedback session, it is necessary not only to perform simulated interviews, but to also have feedback sessions. The purpose of this study is to clarify at which point self-efficacy in medical interview performance increases, when both simulated interviews and feedback discussions are conducted.

Methods

Ethical considerations

This study was approved by the Fukushima Medical University Research Ethics Committee (approval number 30299). Before participation, the purpose and methods of this study, the voluntary nature of participation, the freedom to withdraw from the study, and participant confidentiality protections were explained verbally and in writing. Participants indicated their full and free consent to participate by signing the consent form.

Participants

A total of 162 students (109 men, 53 women) in their fourth or fifth year of medical education in an urban area in Japan participated in this study. Outcome data was collected between October 2018 and October 2019, and simulation education was conducted as part of clinical practice after passing the Objective Structured Clinical Examination and simulation education was conducted as part of the mandatory curriculum after passing the pre-clinical OSCE, a national undergraduate medical exam allowing progression to clinical training.

Program

The participants were divided up into groups of six to eight. The program comprised clinical reasoning and simulation education. The students were taught by two doctors and one facilitator (nurse or clinical psychologist). Among these students, one or two in each group participated in clinical reasoning interviews that were excluded from this analysis as these did not involve a feedback session.

The simulation education medical interview training was conducted in two phases: a simulated interview with an SP and a feedback session (Figure 1). The structured simulated medical interview session time was about 3 hours, comprising of: clinical reasoning for 40 minutes, simulated interview with SP for 60 minutes, and feedback for 110 minutes.

In simulated interviews with SPs, two scenarios were conducted alternately: one involved providing lifestyle guidance to a patient with a chronic disease and the other involved delivering bad news to a cancer patient. The simulated interview lasted for 10 minutes with an SP, and was conducted in a private room, with the other students and teachers observing the situation on a monitor in a different room.

In the feedback session, the student(s) who served as interviewers expressed their impressions and received peer-to-peer feedback (including positive and negative aspects of the interview and perspectives on what they would do in the same situation). Next came feedback from the SP (positive aspects of the interview, and feedback on verbal and non-verbal cues) followed by feedback from the teacher (with feedback relating to medical communication). Finally, the student(s) in charge of the interview gave feedback.

Outcome measure

The numerical rating scale (NRS) was used to assess self-efficacy in 11 increments, from 0 (no self-efficacy) to 10 (high self-efficacy) [13]. The instructions for the assessment were slightly modified and the students were asked to assess self-efficacy while conducting a medical interview. The students were asked: "On a scale of 0 to 100, please rate your ability to do a medical interview". The students circled the number that represented their answers on the NRS. The validity of the degree of self-efficacy on the NRS was confirmed by the visual analogue scale, which is used in almost the same way as the NRS [14]. Self-efficacy was self-measured at three time points: before (T1) and after the simulated interview (T2), and after the feedback session (T3).

Statistical analysis

Descriptive statistics were calculated for each time point. Repeated measures analysis of variance was performed, with the degree of self-efficacy at each point in time as the dependent variable and time as the independent variable. When the results were significant, a sub-analysis was performed using the Bonferroni method. The effect sizes between each measurement time point were calculated using Hedges' *g*, and were judged as small at .10, medium at .50, and large at .80 [15]. The ability to conduct medical interviews may be influenced by gender [3], and may be affected by differences in scenarios such as lifestyle guidance in patients with chronic diseases or delivering bad news to cancer patients. Therefore, we performed two, two-way repeated ANOVAs, one for gender and one for scenario differences between the subjects. If the interaction was significant, a sub-analysis was performed using the Bonferroni method.

Results

Table 1 shows the descriptive statistics for each time point. The repeated ANOVA showed that the main effect was significant ($F[2, 322] = 129.34, p < .01$). Sub-analysis revealed that self-efficacy was higher at T2 and T3, than at T1. Self-efficacy was higher at T3 than at T2. The effect size was small (Hedges' *g* = 0.31) for T1-T2, large (Hedges' *g* = 1.23) for T1-T3, and large (Hedges' *g* = 0.98) for T2-T3. These results indicate that self-efficacy was increased by the simulated interview itself and was further increased by the feedback session.

Table 1
Descriptive statistics and results of ANOVA

Self-efficacy score	T1		T2		T3		Time	Time*Group
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i> value	
All students	4.26	1.52	4.75	1.75	6.15	1.53	129.34 *	-
Gender								
Male	4.27	1.53	4.70	1.82	6.10	1.60	116.03 *	0.28
Female	4.25	1.52	4.85	1.62	6.25	1.39		
Scenarios								
Life Guidance	4.21	1.64	4.87	1.63	6.24	1.47	126.88*	1.25
Delivering bad news	4.32	1.36	4.60	1.90	6.04	1.61		
Note: <i>M</i> = Mean score, <i>SD</i> = Standard deviation, <i>p</i> * < .01								

We also conducted two repeated measures two-factor ANOVA with either gender or scenario as independent variables. The interactions between time and gender ($F[2, 320] = 0.28, p = 0.76$) or scenario

($F[2, 320] = 1.25, p = 0.29$) were not significant. Only the main effects of time were significant (Table 1). Therefore, gender and scenario did not affect the above results.

Discussion

This study aimed to clarify whether the degree of self-efficacy of medical students performing medical interviews increased after the simulated medical interview or after the feedback session. We found that the self-efficacy of medical students conducting medical interviews increased after the simulated interview and increased further after the feedback session.

The self-belief that one has in conducting a medical interview increases once the participant has actually experienced the interview. Social skills training includes role plays that employ authentic communication skills that are used in an actual situation [16]. Role plays improve self-efficacy by implementing an action [7], and we believe that self-efficacy improved in the same way while conducting medical interviews. We found, for the first time, that self-efficacy increased at the end of the role-play before the feedback session began, compared to before the role-play began.

We also found that the gain in self-efficacy after the medical interview improved further after a feedback session. This has not been reported in previous studies. Expanding one's knowledge via feedback from simulated patients, doctors, and peers is considered useful and positive [12]. Positive feedback is a social reinforcer, resulting in positive emotions and increases the positive cognition that one can perform the same task equally well in the future [17]. Therefore, medical students may have internalized this, "*I will be able to conduct medical interviews in the same way as I did just now*", thus leading to an improvement in self-efficacy.

Conclusion

After conducting an interview with a simulated patient, it was important to have a feedback session. Self-efficacy for medical interviewing contributes toward ensuring that medical students conduct high quality, effective medical interviews, which transmits subsequent benefits to the patient. Feedback sessions are essential regardless of the student gender or interview scenario.

One limitation of this study is that the effects of behavior modeling could not be controlled. Modeling increases the probability of the occurrence of an action by observing a specific action being caused [7]. Self-efficacy can be improved through modeling. The students observed each other's interviews. Therefore, self-efficacy may have also improved through modeling. Future research should strive to establish an experimental design that controls for the effects of modeling, although there are problems specific to such experimental methodologies, such as the inability to reproduce genuine effects obtained in the natural setting.

Abbreviations

NRS = numerical rating scale, SPs = simulated patients

Declarations

Availability of data and materials

The anonymized dataset used and/or analyzed during the current study are available from the corresponding author (Shuntaro Aoki, e-mail: s-aoki@fmu.ac.jp) on reasonable request.

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Contributions

SA conceived the study, conducted the statistical analysis, and wrote and edited the manuscript. KY, YM, NS, HS, ZT, MY, YC and, MS conducted the data collection, management of the practical training, and edited the manuscript. YS and KO provided overall supervision of the study and the manuscript. The final manuscript has been approved by all the authors.

Ethics declarations

Ethics approval and consent to participate

Research involving human participants, human material, or human data, must have been performed in accordance with the Declaration of Helsinki. Ethics approval was obtained from the Fukushima Medical University Ethics Committee (approval number 2019–30299) and participants freely gave informed consent.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interest.

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Figures

Figure 1

Flowchart of simulated interview with SP