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Role-playing for more realistic technical skills training

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SUMMARY *Clinical skills are an important and necessary part of clinical competence. Simulation plays an important role in many fields of medical education. Although role-playing is common in communication training, there are no reports about the use of student role-plays in the training of technical clinical skills. This article describes an educational intervention with analysis of pre- and post-intervention self-selected student survey evaluations. After one term of skills training, a thorough evaluation showed that the skills-lab training did not seem very realistic nor was it very demanding for trainees. To create a more realistic training situation and to enhance students' involvement, case studies and role-plays with defined roles for students (i.e. intern, senior consultant) were introduced into half of the sessions. Results of the evaluation in the second term showed that sessions with role-playing were rated significantly higher than sessions without role-playing.*

Introduction

Skills-lab training is relevant for doctors' everyday lives and for patient safety. Positive effects of skills training have been evaluated in several studies: skills training leads to the performing of more skills on the ward (Scherpbier, 1997), higher scores on written skills tests (Remmen *et al.*, 2001) and improved OSCE performance (Bradley & Bligh, 1999). Skills-lab training may involve communication skills as well as clinical technical skills. In this article, however, we will focus on the training of procedural technical skills among undergraduate medical students performed on dummies or on each other.

In regards to simulation, skills-labs take an intermediate position between high-fidelity and low-fidelity simulation. The potential value of high-fidelity simulator training has been shown in a number of studies (Gaba *et al.*, 2001; Garden *et al.*, 2002). In contrast, low-fidelity and intermediate-fidelity settings often fail to create a realistic training atmosphere. The question addressed here by the authors is how to create a training atmosphere with a higher face validity especially in low-fidelity and intermediate-fidelity simulation settings.

Role-playing is widely used as a method in the field of communication training (e.g Cauhan & Long, 2000; Magnani et al., 2002; Nikendei *et al.*, 2003) and focuses on the interaction between participants (Tolan & Lendrum, 1995). There are at least two simulative components of role-playing: the ''deputy acting'' (Kochan, 1981) and the ''as-if actions and circumstances'' (Yardley-Matwiejczuk, 1997). With these methods participants take on a particular role in a simulated true-life context, acting *as-if* they were another person in a given situation. Here risk-free practice becomes possible (Simpson, 1985). Furthermore, the practice of immediate feedback following role-playing is of high didactic value (Tolan & Lendrum, 1995).

Surprisingly, there are no reports on the use of student role-plays in skills-labs in the teaching of procedural technical skills. Role-playing provides an opportunity for improving the realism of the training situation, while at the same time allowing students to become more involved. The aim of our study was to investigate (1) if role-playing in skills-lab training is feasible, (2) if it is well accepted, and (3) if immediate peer feedback of fellow students was found to be valuable by participants.

Methods

Design of skills training and undergraduate curriculum

In preparation for the new curriculum HEICUMED at the University of Heidelberg (Seller, 2003) we initiated a pilot project during the summer term of 2001. The two-term pilot project consisted of skills-lab training, communication skills training, and bedside-teaching. During the first term, students had three, and in the second term, four 90 minute sessions in skills-lab training, communication training with standardized patients (Jünger & Köllner, 2003), and bedside-teaching with inpatients. The pilot project was accompanied by lectures and student placement on the ward to reinforce clinical skills in practice. Students participated in the different sessions in groups of twelve.

Sample

During each of the two terms, 131 students participated in the training. Of these, 114 (87%; 65 male, 49 female) volunteered to fill out the evaluation questionnaire after the first term and 79 students (60%; 45 male, 34 female) after the second term. The reduced participation may have been related to the upcoming final exams. Most of the students were in their 6th term of medical education. The mean age of the students was 23 years.

First and second term: training content

Three 90 minute skills-lab sessions were conducted during the first term. Each session was divided into two 45 minute

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sections and focused on a particular topic, such as gastro-enterology (ascites puncture and naso-gastric tube insertion), cardiology (electrocardiogram and doppler-sonography) or respiratory medicine (artificial ventilation, intubation and spirometry). Following an introduction by the tutor, supervised practice began. Ascites puncture, nasogastric tube insertion, artificial ventilation and intubation were performed on dummies, whereas all other exercises of the sessions were practised on each other. There was no role-playing during this term.

After the evaluation of skills-lab training following the first term, the didactic concept changed considerably for half of the sessions. Role-playing based on case scenarios were introduced into four skills-lab sessions (see Table 1). Those sessions with role-playing had a defined time structure and setting, as described below.

Table 1. Grading of skills-lab sessions at the end of the second term ($n = 79$).

Skills-lab session	Mean	SD
abdominal sonography		
abdominal sonography I[1]	2.59	1.26
abdominal sonography II[1]	2.35	1.37
regulation of blood circulation		
tilting table examination[1]	3.92	1.45
principles of psychophysiology[1]	3.31	1.44
invasive procedures		
management of bladder catheter[2]	2.53	1.08
blood transfusion[2]	2.23	1.11
physical examination		
physical examination[2]	2.43	1.12
examination of thyroid gland[2]	2.20	0.97

Notes: [1]session without role-playing; [2]session with role-playing.

Case studies, role-playing, and feedback rules during second term of training

At the beginning of each session the tutor demonstrated the technical skills to be learned, based on requirements in the tutor handbook (Nikendei *et al.*, 2001). Case studies set up the framework and the 'story' for each role-play. Introductory instructions required students to break out into groups of three and to take on roles as either doctor, patient, or supervising colleague. After assigning the roles, case studies were read aloud within each small group. The groups were instructed to start the role-play immediately after reading the scenario. An example of an assigned case study on blood transfusion, with instructions for students and a checklist for feedback are shown in Figure 1. In this session, students had to inform the patient about the medical procedure, take blood, check compatibility by performing a bedside test and check the blood prior to transfusion including the identity labels. Various case studies were available to simulate situations in which blood transfusions might be necessary.

During the simulation, role-playing rules were to be respected. The students taking on the doctors' roles were asked to wear doctors' attire and to interact with patients played by fellow students, as doctors would in the clinical setting. Interrupting the role-playing was to be avoided. In the case of the blood transfusion scenario, the patient offered information about his clinical history, including dates and other information provided in the role-play materials. The student in the role of supervising colleague observed the role-playing and evaluated the doctor's performance in matters of technique and doctor-patient relationship, based on a predefined checklist developed by our tutor team at the Medical Hospital. At the end of the scenario, the student assigned to be the supervising colleague provided feedback to the 'doctor' based on this checklist. Every ten minutes roles were changed within the same small groups so that each

Case study I – blood transfusion

Instructions:

1) Divide yourselves in groups of three
2) Student 1: doctor on duty
3) Student 2: supervising colleague
4) Student 3: patient (Mr/Mrs Wilde, born 3.2.52)
5) Please respect role-playing rules
6) Role-playing starts directly after reading the case study aloud
7) Role-playing ends with the beginning of the blood transfusion
8) Supervising colleague gives feedback afterwards

"You are on duty in the emergency room. Mr/Mrs Wilde is brought into hospital with haematemesis. His pulse is fast (120/min) and blood pressure is 95/40mmHg. An immediate blood analysis shows that Hb is 7g/dl. You inform that patient that they require a blood transfusion. You take some blood for testing and ensure that the patient details match those on the blood to be transfused. You inform your patient about every step you intend to do. You are supervised by an experienced colleague who gives feedback afterwards."

Checklist for supervising colleague

Technical procedures:

Procedure carried out adequately?	**Y**	**N**
Prearrangement of all material needed	☐	☐
Checking patient data on the label	☐	☐
Checking blood group on the label	☐	☐
Checking of blood bag number	☐	☐
Withdrawing of blood	☐	☐
Notes patient data on the bedside test	☐	☐
Correct interpretation of bedside test	☐	☐

Doctor-patient interaction:

Doctor…		
friendly	1 2 3 4 5 6	unfriendly
calm	1 2 3 4 5 6	agitated
certain	1 2 3 4 5 6	uncertain
Information given to the patient…		
complete	1 2 3 4 5 6	fragmentary

Use this checklist for your feedback!
Please respect feedback rules!

Figure 1. Case study, instruction for students and checklist (shortened example).

student had the chance to perform each role at least once with a different scenario.

Evaluation methods and statistical analysis

The evaluation after the first term of training included a questionnaire in which students graded the single sessions using ratings from 1 (very good) to 6 (unsatisfactory). In addition, the questionnaire contained two open questions: ''what did you enjoy?'' and ''what could have been done better?'' During the evaluation of the second term, in addition to grading, students answered questions concerning the time management of the course, its didactic realization, and the relevance of skills training. The data resulting from evaluative survey instruments administered to a self-selected group of participating students are presented as mean ± SD, except where otherwise specified. To test for significant differences between means, a two-sample-*t*-test was used. To test for differences between sessions in the second term, paired-t-tests were used. A *p*-value of $p < 0.05$ was considered statistically significant.

Results

Evaluation of skills-lab training after the first term of training

At the end of the first term the three skills-lab sessions were graded with marks between 2.98 (respiratory medicine; SD = 1.22) and 3.39 (gastroenterology; SD = 1.25). The cardiology session was graded at 2.81 (SD = 1.10). The gastroenterology session scored significantly worse than the sessions on cardiology and respiratory medicine ($p < 0.002$ and $p < 0.001$).

The survey yielded 168 qualitative comments from students. Some of the most notable results showed that 14% of students referred to skills training as not convincingly representing realistic situations. However, students felt it was valuable to integrate more practice into medical education, and tutors were seen as being dedicated. Students requested more exercises with each other, which they found to be valuable. In terms of basic structure, students commented that the groups were too large, that there was not enough time to practice, and that the opening lecture given by tutors was too long.

Evaluation of skills-lab training after the second term of training

Grades for the single sessions at the end of the second term, after the introduction of role-playing and case studies, are shown in Table 1. Sessions with role-playing were graded significantly higher than sessions without role-playing in this term of training ($p < 0.001$).

Of participating students, 67.5% felt that the content of the skills training was important for future professionalism, while 64.9% thought it important for patient safety. Role-playing and feedback were considered to be important tools of education by 58.4% and 72.2% of learners, respectively. While 84.2% of medical students were of the opinion that the defined time structure was helpful, only 44.2% felt there was sufficient time to practise (see Figure 2).

Discussion

To create a more realistic skills training environment, we introduced role-playing and case studies into our skills training program. During the second term of our pilot project, those sessions which included case studies and role-playing were graded significantly higher than those without these didactic components. Role-playing was seen to be an accepted, feasible, and useful educational method, in combination with traditional skills-lab activities.

We believe that the simulative aspects of role-playing (Yardley-Matwiejczuk, 1997) enhance the realistic look and feel of skills training, making it more engaging and motivating for participants. A defined role-playing

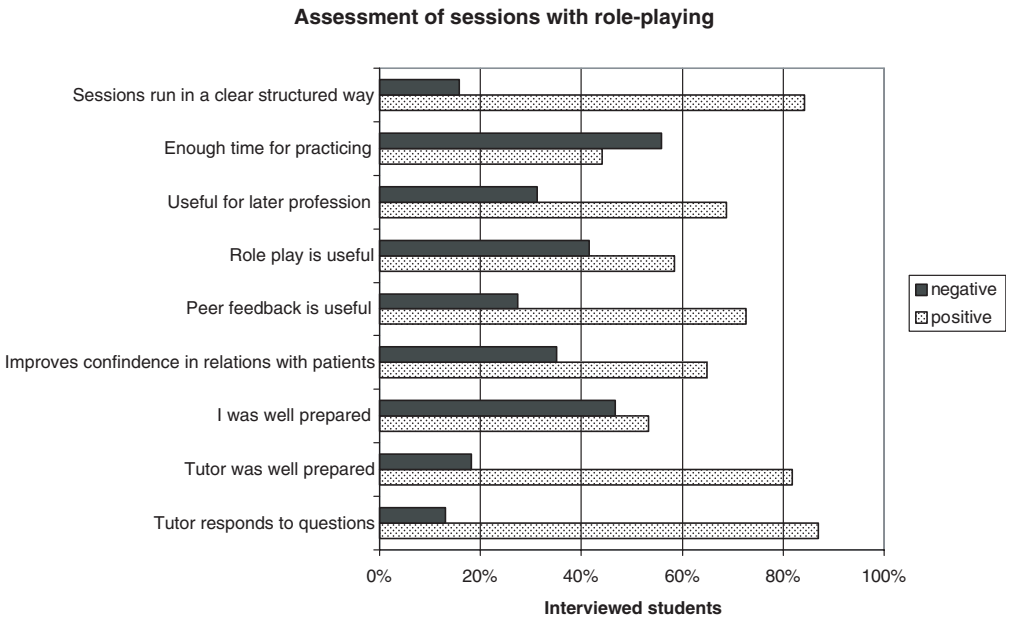

Figure 2. Judgement of didactic realization ($n = 79$).

scenario allows the development of role expectations and provides for a similar atmosphere as that which can be expected in real-life situations, during a person's medical education or professional career. The case studies provide the scenario with important basic information involving the situational and spatial context, the actual role of the doctor, short medical information about the patient, and finally instructions for the doctor. Accordingly, role-playing and as-if circumstances based on case studies ensure a more convincing and livelier role-play. In the context of role-playing, even simple procedures, such as venepuncture in the blood transfusion example above, reach increased significance and attain new value. However, there is further need for studies in a group control design to investigate the effects of simulation and acceptance of role-playing in a skills program setting.

We believe that role-playing represents a useful medium for combining technical skills procedures and communication skills, even early on in a student's medical education. Skills training with standardized patients (Kneebone, 2002) and more complex scenarios can be introduced later, after a certain degree of security and experience has been attained through skills training with student role-playing. Additionally, the immersion into the role of another person through deputy acting allows students the chance to gain familiarity with patient perspectives and insights (Simpson, 1985). We believe that this experience, which is missing from training with standardized patients or bedside-teaching with inpatients, is important for the development of future doctor-patient relationships.

Our experience shows that after initial diffidence (cp. Wibley, 1983), students are very willing to become engaged with their roles, and role-playing actually becomes enjoyable. This is supported by our observations that sessions in which very simple dummies were used (e.g. bladder catheter management), but also included a role-playing scenario, were rated higher than sessions without a role-play component. In the first term of our skills training, students claimed that exercises with dummies do *not* reflect reality. This could indicate that the use of dummies might be graded upwards if combined with role-playing.

Regarding the tutor's role, we observed that tutors who projected a positive attitude towards the method of role-playing and convincingly introduced the students to the didactic concept achieved better results: students were more committed, performed better and appeared to enjoy the role-playing more. A positive attitude was seen in the majority of tutors.

Feedback was an important aspect of the intervention. Our students considered feedback given by fellow students a very important element of learning and teaching. In communication training, feedback procedures are already well accepted and well established (Goold & Lipkin, 1999; Dugdale *et al.*, 1999; Van Dalen *et al.*, 2001). We believe that structured feedback among fellow students is an indispensable part of technical skills training.

Conclusion

The results of the evaluation of our skills-lab training pre- and post-intervention with role-playing showed that simulative effects of role-playing scenarios in skills training were well accepted by our students. Student participation in role-playing, as well as the accompanying feedback, was considered to be relevant elements of training. In an effort to create a more realistic training situation, role-playing proved to be a valuable learning tool.

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