Title

Interprofessional educational team to develop communication and gestural skills

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Study Aim

The aim of this study was to assess student satisfaction with interprofessional laboratory training and Advanced Simulation Center.

A number of international studies have shown that laboratory training, particularly through the application of the principles of interprofessional learning, is an effective means of developing the communication and gestural skills of healthcare professionals. At the Advanced Simulation Center of the University of Genoa we have therefore established the first clinical skill laboratory with medical school students and an interprofessional team of trainers, as the first step towards developing interprofessional training of both medical and nursing students at our University.

Methods

The establishment of the new Center of Advanced Simulation marked the beginning of the interprofessionalization process at an Italian Univeristy. After analyzing the specific aims of the third year medical school curriculum, we identified seven topics for the laboratory sessions that would contribute to the development of communication and gestural skills: venipuncture, measuring central venous pressure, rectal examination, bladder catheterization, surgical wound care, physical examination and taking a patient's medical history.

The team of trainers was comprised of medical doctors and nurses who are involved in teaching at the Medicine and Nursing programs at an Italian University. Actors played the role of simulated patients and some students volunteered as standardized patients.

Learning of gestures and techniques was supported by interactive multimedia simulators and by the instruments and materials required to perform the activity planned for each laboratory session.

Communication skills were taught during a specific laboratory session by means of role play, with students playing the role of general practitioners meeting patients for the first time and taking their medical history. This session was video- and audio-recorded, so both tutors and students had the opportunity to evaluate the relational dynamics in the role-play by watching it on a large screen in a separate room. Students then evaluated the role-play a second time, watching the recording again and using an observation grid; the content and manner of communication were thus analyzed in a structured way.

All of the 261 students enrolled in the third year of Medical School were invited to participate in the different steps of the seven laboratory sessions: observation of simulation, structured brain storming, production of checklists and reproduction of activities with interactive simulators, fellow students and simulated patients.

Once all the laboratory sessions had taken place, the students were asked to fill out an anonymous questionnaire.

The questionnaire was designed based on literature review, and its internal consistency was measured by calculating Crohnbach's Alpha. It included two sections. The first section of the questionnaire focused on the students' perceptions of how important the topic of each laboratory session was. Students were asked to express their view on whether the topic could or could not be replaced. The second section evaluated the training methods, the materials used during the laboratory sessions and the trainers.

A five-point Likert scale was used to measure satisfaction.

Construct validity analysis was conducted on the results of the questionnaire using the Statistical Package for Social Sciences (SPSS)" (version 21), and "Monte Carlo PCA for Parallel Analysis" softwares, with eigenvalues >1, and allowed the extraction of three factors: "method used", "materials and instruments" and "trainers". A principal components matrix with Varimax rotation was run to identify the variables that described each individual factor. A further factor, "instruments produced by the students", which was originally included in the "materials and instruments" section, was thus found to be described by four variables and added, although it had an eigenvalue that was slightly <1.

The study have been performed with the approval of San Martino Teaching Hospital ethics committee.

Results

Two hundred and thirty-five out of the 261 (90%) third year medical students who were invited to participate in the laboratory sessions presented to the Advanced Simulation Center; 61% were males and 39% females. The average age was 23.7 years (SD 0.97).

The questionnaire's internal consistency was measured by calculating Crohnbach's Alpha. Optimal consistency was found, with a score of 0.865.

All of the 235 students were administered the questionnaire, and 232/235 (99%) completed it and handed it in.

Student responses to the first section of the questionnaire were highly positive, and all of the topics covered during the sessions were considered important. Laboratory sessions on bladder catheterization, physical examination and relational and communication skills were considered not replaceable by almost all of the students. Less importance, albeit with good satisfaction (59%), was attributed to the laboratory session on measuring central venous pressure.

In the second section, the students gave a high rating to the training method used. Seventy-one percent of the students stated that the aims were clearly defined. The simulations were demonstrated

in a clear and detailed manner according to 83% of the students, who scored it 4 out of 5. Overall, 48% of the participants stated that the amount of time allotted to practice was not fully satisfactory: 35% stated that it was somewhat satisfactory, 14% that it was slightly satisfactory and 3% that it was not at all satisfactory.

Regarding the materials and instruments used for laboratory training, the students were asked to evaluate the audiovisuals, the equipment and the disposables used during the different laboratory sessions, as well as the interactive multimedia simulators and the checklists they developed during the simulations. On average, our findings showed high ratings with regard to the audiovisuals (4), the simulators (3.8), the capability of checklist creation to stimulate critical thinking (3.6) and the intention to use checklists in clinical settings in the future. Slightly lower average ratings, albeit still within positive range (>3) were recorded with regard to the suitability of materials and equipment (3.5) and the capability of checklist creation to prompt students to seek for scientific evidence (3.5).

Trainers were evaluated with regard to their level of expertise , their willingness to provide students with additional information when so asked, and their level of communicativeness. The results obtained were highly positive, with an average value exceeding 4. The highest average values were recorded for approachability (4.5), and level of cooperativeness (4.75).

Based on these results we hypothesized a range of possible different correlations between the variables in the questionnaire, and tested them using contingency tables, chi square and Fisher's exact test.

A significant correlation was identified between clear representation in simulations, suitability of the materials and equipment used ($p=0.045$) and the good conditions of the models and mannequins used ($p=0.034$). Significant correlations were also found between clear representation in simulations and the communication skills of trainers ($p=0.002$), and between the intention to use checklists and observation grids as reference in the future and the intention to participate in future clinical skill laboratory sessions ($p=0.005$).

Construct validity analysis was conducted on the results of the questionnaire using the Statistical

Package for Social Sciences (SPSS)" (version 21), and "Monte Carlo PCA for Parallel Analysis" softwares, with eigenvalues >1, and allowed the extraction of three factors: "method used", "materials and instruments" and "trainers". A principal components matrix with Varimax rotation was run to identify the variables that described each individual factor. A further factor, "instruments produced by the students", which was originally included in the "materials and instruments" section, was thus found to be described by four variables and added, although it had an eigenvalue that was slightly <1.

Overall, the third year medical students who participated in the clinical skill laboratory sessions at the Advanced Simulation Center evaluated the experience positively.

The topics of the sessions, which were chosen by a panel of trainers based on the third year medical school curriculum, were generally considered to be not replaceable, although one of the topics was given a slightly lower score. Active involvement of the students from the planning stage onwards, including the choice of topics, may have improved their perception of how useful the topics covered were.

The methods used for the demonstrations, for content processing by students through structured brainstorming, for the development of checklists and for the replication of procedures by students with simulators or simulated patients, followed published guidelines (Ledingham & Harden, 1998) (Byrne, Pugsley & Hashem, 2008). Our results show that these aspects were considered to be very important, particularly in the case of the capability of the instruments created by the students during the simulations to prompt them to seek for scientific evidence. The highly significant correlation ($p=0.005$) between the item "I may use the checklists and observation grids as reference in the future" and the item "I would like to participate in a similar clinical skill laboratory again" emphasizes how important instruments created by students are, how students considered them to be one of the results of the laboratory sessions, and how crucial they were in encouraging students to contemplate the possibility of participating again in similar activities.

The Advanced Simulation Center provided a learning environment that was ideally suited to our aims. The Center's facilities allowed us to set up seven laboratories at the same time in adjacent rooms, which saved considerable time and made quick transitions between one station and the next possible, thus keeping students' concentration levels high. Setting up the different stations was made easier by the facilities, which have been designed specifically for this purpose and thus provided a life-like, realistic quality to the simulations. The significant correlation ($p=0.035$) between the variable "simulations were clearly demonstrated" and the variable "models and mannequins were in good conditions", and the variable "the equipment and disposables were satisfactory" ($p=0.045$), show how important facilities, materials, equipment and simulators are to obtain good quality, clear simulations of different clinical situations.

The students' positive evaluation of the laboratory sessions on practicing and developing communication skills was positively influenced by the audio and video equipment available at the simulation center, which makes it possible for students to watch simulations and then analyze the relational dynamics observed from a separate room on a large screen.

Most students were also satisfied with the materials, instruments and interactive simulators. In some of the laboratory sessions, especially the one on bladder catheterization, the role of simulators was key. In other sessions, such as the ones on physical examination or surgical wound care, simulators were not as important but were still positively evaluated owing to their high-tech quality and the life-like simulations.

The students showed high satisfaction with the fact that the trainers belonged to an interprofessional team. They rated this variable very highly in terms of trainer expertise, approachability and communicativeness. The trainers' experience with methods, their gestural skills, their theoretical knowledge, and the variety of points of view reflecting different professional backgrounds also led to results that were markedly appreciated by students. The highly significant correlation ($p=0.002$) between the variable "the simulations were clearly demonstrated" and the variable "the trainers

were communicative" emphasizes how the tutors' role is crucial to obtaining high quality, clear simulations of a range of clinical situations.

Conclusions

The results of our study show that the participating students were very satisfied with the clinical skill laboratory sessions, and were interested in participating in similar activities in the future. Although the study was conducted on a group of students who were all enrolled in the same year of medical school, we believe these findings suggest that laboratory sessions should become an integral part of the curriculum of medical students (Rosen, Mc Bride & Drake, 2009).

The participants were also very satisfied with the trainers' expertise, approachability and communicativeness. One limitation of this study is that the trainers' perceptions with regard to the interprofessional experience were not recorded.

In the future we aim to extend this interprofessional experience to the entire medical and nursing student population at our University

Keywords

Interprofessional education, clinical simulation, medical students, nursing students.

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