Simulated patient and role play methodologies for communication skills and empathy training of undergraduate medical students

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Abstract

Background

Verbal and non-verbal communication, as well as empathy are central to patient-doctor interactions and have been associated with patients’ satisfaction. Non-verbal communication tends to override verbal messages. The aim of this study was to analyze how medical students use verbal and non-verbal communication using two different educational approaches, student role play (SRP) and actor simulated patient (ASP), and whether the non-verbal behaviour is different in the two different poses.

Methods

Three raters evaluated 20 students playing the doctor role, 10 in the SRP group and 10 in the ASP group. The videos were analyzed with the Calgary-Cambridge Referenced Observation Guide (CCG) and, for a more accurate evaluation of non-verbal communication, we also evaluated signs of nervousness, and posture. Empathy was rated with the CARE questionnaire. Independent Mann Whitney U tests and Qhi square tests were performed for statistical analysis.

Results

From the 6 main tasks of the CCG score, we obtained higher scores in the ASP group for the task ‘Gathering information’ (p=0.0008). Concerning the 17 descriptors of the CCG, the ASP group obtained significantly better scores for ‘Exploration of the patients’ problems to discover the biomedical perspective’ (p=0.007), ‘Exploration of the patients’ problems to discover background information and context’ (p=0.0004) and for ‘Closing the session – Forward planning’ (p=0.02). With respect to non-verbal behaviour items, nervousness was significantly higher in the ASP group compared to the SRP group (p<0.0001). Concerning empathy, no differences were found between the SRP and ASP groups.
Conclusions

Medical students displayed differentiated verbal and non-verbal communication behaviour during the two communication skills training methodologies. These results show that both methodologies have certain advantages and that more explicit non-verbal communication training might be necessary in order to raise students’ awareness for this type of communication and increase doctor-patient interaction effectiveness.

Background

Effective communication and empathy are central to patient-doctor interactions and have been shown to be associated with patients’ satisfaction, disclosure, compliance, and ultimately, with the outcomes of the medical process [1-3]. Moreover, patient-centered care was associated with decreased utilization of health care services and lower total annual charges [4]. Therefore, programs on communication skills training (CST), including empathy, have a well established value in the medical curricula [4].

Communication in medical encounters comprises verbal and non-verbal aspects. Non-verbal messages tend to override the verbal messages and as reported by Mehrabian and Ferris, the impact of the verbal communication represents only 7% from the total impact of communication [5, 6]. On the other side, vocal communication has an impact of 38% and facial communication, 55% [5]. Therefore, non-verbal signs of the physician like eye contact, posture, tone of voice, greatly influences patient’s disclosure and satisfaction [6, 7]. Empathy is also a critical point of the communication process and is associated with patients’ satisfaction and outcomes [8-10].

Based on the premise that communication skills and empathy are not innate but rather can be learned and improved, educators are continuously improving their didactic methods in order to teach effectively medical communication and empathy [11-13]. Interactive approaches that typically rely on role play, simulated or standardized patients
are now favored [14, 15].

Taking into account that health systems worldwide are facing shortages in terms of resources, including their resources for medical education, the student role play (SRP) represents a cost-free, and therefore, an attractive approach for medical curriculum designers [16]. Previous research has shown that there is a particular educational benefit to SRP, regarding students’ understanding of the patient perspective, which can be achieved by playing not only the doctor role, but also the role of the patient [17].

Concerning the professional actor simulated patient (ASP) approach, it represents an expensive tool for CST but students and faculty value mostly the realism and the depth of emotion of the situation, and the layperson perspective and feedback of the actor [18, 19].

There are several studies demonstrating comparable performance levels between ASP and SRP, but there is a cost-effectiveness advantage for SRP [16, 17]. However, there are few studies that evaluate the most impactful part of the communication process, the non-verbal communication [5]. In this context, the aim of our study was to analyze whether and how well medical students from the Faculty of Medicine of Brest use skills of verbal and non-verbal communication in the 2 different approaches, SRP and ASP. We also wanted to identify if the well recognized higher authenticity of the ASP approach generates different non-verbal behaviors as compared to the SRP approach. The non-verbal behaviors are generally under less conscious control but if recognized, this type of communication can also be auto-controlled and improved [20].

Methods

Educational workshops and participants

Since 2016, the undergraduate curricula at the Faculty of Medicine of Brest, France, includes a CST program, with a particular focus on empathy. The program is relying on an
interactive approach by using SRP for the fourth year medical students and ASP for the fifth year students. The CST program is realised at the Simulation Center (CeSIM) of the Faculty of Medicine.

CST workshops of the forth year students were facilitated by a general physician and a communication specialist. The duration of the workshops was of 6 hours, during which, 15 students were portraying the role of patients, family members and doctors. The enacted cases were based on typical or usual presentations of asthma or coronary disease in a patient who is denying and minimising the disease and who is accompanied in consultation by a worried family member.

The fifth year medical students CST workshops were facilitated by a clinical haematologist, a clinical psychologist and 2 professional actors. The duration of the workshops was of 4 hours and 15 learners were participating. During the workshop, 2 medical students portraying the doctors interacted directly with 2 professional actors portraying the patient and a family member. The 2 enacted cases represented 2 different times of the same clinical situation based on a lymphoid disease presentation. The first time the ASP presented systemic symptoms such as weight loss, night sweats and fever as well as an inflammatory low back pain. The second time, the doctor saw the patient with the results of the exams realised and had to explain to the ASP the presence of a retroperitoneal adenopathy observed on the CT scan. The ASP was initially denying and minimising the symptoms, but became more aware of the situation in the second scenario.

For the 2 consultation times, the ASP was accompanied in consultation by a second actor playing the role of a worried family member.

Learners not directly implicated in the SRP and ASP situations observed the interaction through a closed circuit video, in another room. All medical simulation interviews were filmed and recorded. Each enactment was immediately followed by a formal debriefing led
by facilitators and including all the learners.

Sample studied and raters

Ten SRP videos and 10 ASP videos were randomly selected from our data base. The standards of the Declaration of Helsinki were maintained and all participants to the study gave their written consent. The videos were then analyzed by 3 raters, who carried out data collection independently. Raters were represented by a clinical haematologist, a paediatric surgeon and an expert in communication.

Evaluation criteria

For the observation of the videos, 4 different instruments have been used. A global assessment of the communication skills was done by using the short version of the Calgary-Cambridge Referenced Observation Guide (CCG) (Supplementary Table 1) [12, 21, 22]. The CCG assessment grids contained 6 tasks with 17 descriptors, which had to be rated on a 3 point Likert scale (1: Not done; 2: Incompletely done; 3: Done). Although the CCG assesses the non-verbal behavior and empathy, in order to have a more accurate evaluation of these items, we divided the non-verbal behavior criterion into two parts: signs of nervousness, rated on a 4 point Likert scale (1: None; 2: Low; 3: Medium; 4: High), and posture (appropriate/inappropriate) during the first and the last 5 minutes of the session, as well as the global posture. Empathy was rated with the CARE (Consultation and Relational Empathy) questionnaire which contains 10 items (Supplementary Table 2) [23]. The CARE scoring system was developed initially for assessment of physicians’ empathy by patients, but we used it in our study for external rating of empathy. Each item was rated on a 5-point Likert scale (1: Poor; 2: Fair; 3: Good; 4: Very good, and 5: Excellent). All ten items were then added, giving a maximum possible score of 50, and a minimum of 10.

Statistical analysis
Independent Mann Whitney U tests were performed to identify whether the two groups SRP and ASP yielded different CCG scores, CARE scores and nervousness scores. Chi square tests were performed for posture evaluations. The same statistical tests were performed to identify gender communication skills differences.

Results

Over the 2 sessions, 20 students participated in the study, 9 (45%) male and 11 (55%) female (4 male in the SRP group and 5 in the ASP group; 6 female in the SRP group and 5 in the ASP group).

Communication skills differences between SRP and ASP groups

Independent t-tests were performed in order to identify if the 2 groups SRP and ASP yielded different CCG scores (Table 1). The overall CCG scores difference between the 2 groups did not reach statistical significance. From the 6 main tasks, namely initiating the session, gathering information, explanation and planning, building the relationship, providing structure and closing the session, we obtained a significant statistical difference for the task ‘gathering information’, with higher scores attained by the ASP group (p=0.0008, SRP group mean=7.36±1.45, ASP group mean=8.46±0.73). Concerning the 17 descriptors of the CCG, we obtained higher scores in the ASP group for ‘Gathering information – Exploration of the patients’ problems to discover the biomedical perspective’ (p=0.007, SRP group mean=2.36±0.76, ASP group mean=2.83±0.37), ‘Gathering information – Exploration of the patients’ problems to discover background information and context’ (p=0.0004, SRP group mean=2.26±0.69, ASP group mean=2.83±0.37) and for ‘Closing the session – Forward planning’ (p=0.02, SRP group mean=2.46±0.68, ASP group mean=2.80±0.48).

With respect to non-verbal behaviour items, nervousness was significantly higher in the ASP group compared to the SRP group (p<0.0001, SRP group mean=1.33±0.54, ASP group mean=2.00±0.50).
mean=2.36±1.03) and no significant difference was observed between the 2 groups for posture in the first 5 minutes, last five minutes and the entire session. The most frequent signs of nervousness observed by the raters were self-touching (rubbing one’s face, grooming the hair), frequent postural shift, manipulation of objects (mostly the pen) and inappropriate facial display such as smiling or laughing.

Concerning empathy, no differences were found between the SRP and ASP groups for the global CARE questionnaire or CARE items.

**Gender specific aspects of communication skills**

As it is well known that communication styles of female physicians interacting with patients are consistently different from their male counterparts, we also compared the male and female students participating in the study [24].

Concerning the CCG scores, no significant differences were achieved for the global score but female students performed significantly better for the main task ‘Building the relationship’ (p=0.002, female group mean=8.27±1, male group mean=7.40±1.21) and for the descriptors ‘Initiating the session – Identifying the reasons for the consultation’ (p=0.04, female group mean=2.97±0.17, male group mean=2.77±0.5), and ‘Building the relationship – Using appropriate non-verbal behavior’ (p=0.003, female group mean=2.8±0.46, male group mean=2.4±0.63) (Table 2).

With respect to non-verbal communication items, nervousness and posture and to empathy evaluated by the CARE score, no significant differences were found between the 2 gender groups.

**Discussion**

This study demonstrated that there is no significant difference between ASP and SRP in global communication skills evaluated by the CCG questionnaire. However, students’ communication skills were more appropriate when interacting with a professional actor
rather than with a student colleague, in terms of gathering information in order to
discover the biomedical perspective, background information and context but also in
terms of closing the session with forward planning. When raters evaluated the items
‘gathering information’ in order to discover the biomedical perspective, background
information and context, they evaluated if students: (1) tended to facilitate patient’s
responses verbally or non-verbally, (2) paid more attention to the verbal and non-verbal
cues (body language, facial expression, affect), (3) clarified patient’s statements that
were unclear, (4) periodically summarized to verify own understanding of what the patient
had said, (5) used concise, easily understood questions and comments, avoided or
adequately explained jargon, (6) established dates and sequence of events. All the items
before cited are linked to known valuable actor contributions like the higher authenticity
and realism of the ASP situation as well as to the actors’ lack of medical knowledge, an
important asset for the medical experience [18]. The actors’ flexibility in verbal and non-
verbal communication as well as their emotional commitment seemed to generate more
concentration/attention from the learner as well as a more adapted language. While
colleagues know what to anticipate and have comparable clinical knowledge, actors are
highly improvisational. There may be certain strategies and even protocols to approach
challenging conversations, but the reality is that no two clinical conversations are the
same. A successful approach in one setting may be inadequate or even problematic with
another patient or family. Relational proficiency in medical interviews necessitates
recognition of, and flexible response to, variable patient and family cues [25]. In the ASP
context, this relational flexibility seems to be higher and learners have better suited
communication skills for gathering information.

However, an interesting observation is that no difference was observed between the SRP
and ASP groups for the item ‘Gathering information exploration of the patient’s problems
to discover the patient’s perspective’. This item requires a more empathic approach for gathering information. In order to respond to this item, raters paid attention if the learner explored patient’s ideas, patient’s concerns regarding each problem, patient’s expectations, how each problem affects the patient’s life and if he/she encouraged the patient to express feelings. This result is in accordance with the fact that no differences were observed between the SRP and ASP groups concerning the ‘Building relationship’ CCG main task or empathy, as evaluated with the CARE score. During the SRP training, the learner who played the doctor role had not also played the role of the patient. In order to make the access to an empathic approach easier for the peer role play-group, students have to switch roles (doctor and patient), but it was not the case for the SRP training in this study [17, 26]. HM Bosse et al showed that having role-played both the doctor and patient in the exercise is a key to the success of peer role play and creates a heightened awareness for the ambiguity of roles of the partners in communication, facilitating a more empathic approach [17]. The ability to sense and appreciate patients’ views, as well as the empathic approach towards the patients represent the basis for a functioning and safe patient-physician relationship [27]. It improves patient adherence and supports patient safety which are increasingly important issues in physicians’ daily work [28, 29]. Most certainly, switching roles in peer role play should be mandatory during our CST in order to allow learners to experience both biomedical and patient perspectives.

With respect to non-verbal behaviour items, nervousness was significantly higher in the ASP group compared to the SRP group. The most frequent signs of nervousness observed by the raters were self-touching (rubbing one’s face, grooming the hair), frequent postural shift, manipulation of objects (mostly the pen) and inappropriate facial display such as smiling or laughing. The deeper authenticity of the ASP situation and the emotional commitment of the professional actors pushed learners at more important levels of
emotion depth, which could explain the higher nervousness [18]. Self-touching or un purposive movements are signs of anxiety, tension and preoccupation and these non-verbal behaviors are known to accompany a poorer quality of the medical interview [7, 30]. Repeating the ASP exercise could diminish nervousness, increase auto-control and improve learner’s performance. Concerning the inappropriate facial display, namely smiling or laughing at inappropriate moments during the medical interview, in the European culture, it appears to cover embarrassment [31]. Embarrassment is a feeling of concern with one’s public image and with the reactions from others to inappropriate behaviour [31]. Therefore learners in the ASP group present more embarrassment signals compared to the SRP group, as a sign of failure to present a desired image to the actors, whom they seem to regard as evaluators of their performance. The embarrassment signals have a disruptive effect upon social interaction therefore, repeating the ASP exercise could also diminish these signals and improve students’ performances.

Concerning the gender specific differences in CCG scores, female students performed significantly better for the task ‘Building the relationship - Using appropriate non-verbal behavior’ and ‘Initiating the session - Identifying the reasons for the consultation’. Our results are consistent with several studies showing that female physicians interact differently with the patients, compared to their male counterpart by showing more empathy, using more positive statements and more affective behavior when communicating diagnosis-specific information [32–37].

Several limitations to our study should be noted in interpreting these findings. First, its representativeness is weighed down by the small sample of students who participated in the study. However, the fact that all 20 students were evaluated independently by 3 raters increased the accuracy of the results. Second, the communication skills assessment was based on several different scenarios. It has been previously suggested that the
feasibility of a communication skills assessment would depend on the difficulty of the contents of the medical interviews [38]. We consider that even though we used different scenarios, they were similarly challenging for the students. Third, the students from the ASP group were one year older than those from the SRP group. The more adequate skills of ASP group in terms of gathering information in order to discover the biomedical perspective, background information and context, but also in terms of closing the session with forward planning could also be due to their supplementary year of medical education. Forth, although non-verbal behaviors, like nervousness, are under less conscious control than verbal behaviors, and are generally irrepressible, students may have acted differently than in real-life situations because of the simulated nature of the consultation and because they were also being filmed and observed by their colleagues [7, 20]. However, the SRP and ASP workshops took place under the same conditions, therefore, if non-verbal behavior results were biased by these conditions, they were equally biased in both groups.

Conclusion

In this study, data presented suggested that the two CST methods SRP and ASP are highly comparable for undergraduate medical students. However, the ASP method, pushes the learner to use more adapted communication skills for gathering biomedical and context information as well as for closing the session with forward planning. Our results did not show any educational benefit for the ASP method, regarding the empathic approach and students’ understanding of the patient’s perspective. Switching doctor-role with patient-role in the SRP setting could improve these skills in medical students. As a more authentic approach like the ASP generated significantly more frequent signs of nervousness, a new training program for the fifth year medical students’ had been introduced in the Faculty of Medicine of Brest curricula. This new training uses drama in order to increase awareness
and promote non-verbal communication skills in medical students. Curriculum developers are also encouraged to consider both CST methodologies, as they both have specific advantages, and also to repeat the CST workshops for medical students several times in order to help them diminish and also to auto-control their signs of nervousness.

Abbreviations

Communication skills training (CST)
Student role play (SRP)
Actor simulated patient (ASP)
Calgary-Cambridge Referenced Observation Guide (CCG)
Consultation and Relational Empathy (CARE)

Declarations

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Authors’ contributions

CBa has initiated the study, designed the methodology, analyzed the data, interpreted the results and wrote the initial draft; CBe and PDV have contributed to methodology design, the interpretation of the results and to the writing of the manuscript. IC, AHU, MEI have evaluated the videos and contributed to the interpretation of the results, AB and JCI contributed to the interpretation of the results and to the writing of the manuscript; LM and LC participated to the workshops and contributed to the interpretation of the results. BA provided technical help with the videos. All authors have read and approved the manuscript.
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Availability of data and materials

Data may be available by request submitted to the corresponding author.

Ethical approval and consent to participate

The standards of the Declaration of Helsinki were maintained and all participants to the study gave their written consent before entering the study.

Our study is not covered by the scope of the law n° 2012-300 of March 5th, 2012 relating to research involving human subjects; therefore, it does not need ethics approval from ANSM, CPP or CNIL. As no sensitive personal data are analyzed in the study, the authorization of the university Ethics Committee is not necessary.

Consent for publication

Not applicable.

Competing interests

All authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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Tables

Table 1. Calgary-Cambridge guide scores for the student role play and actor simulated patient groups. Adapted from Kurtz SM, 1998 and Silverman JD, 1998 [39, 40]

| CCG main tasks and descriptors | SRP group (n=10) Mean ± SD | ASP group (n=10) Mean ± SD |
|-------------------------------|----------------------------|--------------------------|
| **Initiating the session**    |                            |                          |
| 7.80±1.23                     | 8.23±(                    |
| Preparing the session         | 2.13±0.81                 | 2.43±(                   |
| Establishing initial rapport  | 2.83±0.37                 | 2.86±(                   |
| Identifying the reasons for the consultation | 2.83±0.46 | 2.93±(                   |
| **Gathering information - exploration of the patient’s problems to discover the:** |                       |                          |
| 7.36±1.45                     | 8.46±(                    |
| biomedical perspective        | 2.36±0.76                 | 2.83±(                   |
| the patient’s perspective     | 2.73±0.44                 | 2.80±(                   |
| background information - context | 2.26±0.69 | 2.83±(                   |
| **Explanation and planning**  | 10.67±1.56                | 10.07±                  |
| Providing the correct amount and type of information | 2.53±0.57 | 2.30±(                   |
### Table 2. Calgary-Cambridge guide scores for male and female students. Adapted from Kurtz SM, 1998 and Silverman JD, 1998 [39, 40]

| Category                                             | Mean ± SD Male | Mean ± SD Female |
|------------------------------------------------------|----------------|------------------|
| Aiding accurate recall and understanding             | 2.76 ± 0.50    | 2.46 ± 0.50      |
| Achieving a shared understanding: incorporating the patient’s illness framework | 2.73 ± 0.52    | 2.60 ± 0.60      |
| Planning: shared decision making                     | 2.63 ± 0.61    | 2.70 ± 0.61      |
| **Building the relationship**                        | 8.10 ± 1.15    | 7.66 ± 0.85      |
| Using appropriate non-verbal behaviour               | 2.73 ± 0.52    | 2.53 ± 0.49      |
| Developing rapport                                   | 2.70 ± 0.53    | 2.53 ± 0.50      |
| Involving the patient                                | 2.66 ± 0.60    | 2.60 ± 0.56      |
| **Providing structure**                              | 5.33 ± 1.09    | 5.63 ± 0.85      |
| Making organisation overt                           | 2.66 ± 0.60    | 2.76 ± 0.50      |
| Attending to flow                                    | 2.66 ± 0.60    | 2.86 ± 0.50      |
| **Closing the session**                              | 5.13 ± 1.19    | 5.40 ± 0.85      |
| Forward planning                                     | 2.46 ± 0.68    | 2.80 ± 0.50      |
| Ensuring appropriate point of closure                | 2.66 ± 0.66    | 2.60 ± 0.56      |

**Abbreviations:** CCG, Calgary-Cambridge guide; SRP, student role play; ASP, actor simulated patient; SD, standard deviation
| CCG main tasks and descriptors                                | Male Mean ± SD | Female Mean ± SD |
|--------------------------------------------------------------|----------------|------------------|
| **Initiating the session**                                   | 7.96±1.34      | 8.06±1.04        |
| Preparing the session                                       | 2.37±0.79      | 2.21±0.32        |
| Establishing initial rapport                                 | 2.81±0.39      | 2.87±0.33        |
| Identifying the reasons for the consultation                 | 2.77±0.50      | 2.97±0.46        |
| **Gathering information - exploration of the patient’s problems to discover the:** |                |                  |
| biomedical perspective                                      | 2.55±0.75      | 2.63±0.64        |
| the patient’s perspective                                   | 2.70±0.46      | 2.81±0.46        |
| background information - context                             | 2.48±0.57      | 2.60±0.51        |
| **Explanation and planning**                                | 10.07±2.2      | 10.61±1.67       |
| Providing the correct amount and type of information         | 2.37±0.68      | 2.45±0.66        |
| Aiding accurate recall and understanding                     | 2.51±0.64      | 2.69±0.66        |
| Achievienp a shared understanding : incorporating the patient’s illness framework | 2.55±0.69      | 2.75±0.77        |
| Planning : shared decision making                            | 2.63±0.62      | 2.69±0.65        |
| **Building the relationship**                               | 7.40±1.21      | 8.27±1.04        |
| Using appropriate non-verbal behaviour                       | 2.40±0.63      | 2.81±0.66        |
Developing rapport | 2.48±0.57 | 2.72±0.78
Involving the patient | 2.51±0.70 | 2.72±0.45

**Providing structure** | 5.29±1.17 | 5.63±0.58
Making organisation overt | 2.55±0.69 | 2.84±0.72
Attending to flow | 2.74±0.59 | 2.78±0.45

**Closing the session** | 5.29±1.23 | 5.24±0.73
Forward planning | 2.63±0.62 | 2.63±0.46
Ensuring appropriate point of closure | 2.66±0.67 | 2.60±0.45

Abbreviations: CCG, Calgary-Cambridge guide; SRP, student role play; ASP, actor simulated patient; SD, standard deviation

**Supplementary Files**

This is a list of supplementary files associated with the primary manuscript. Click to download.

Supplementary data.docx