An Effective Teaching Method to Enhance History-Taking Skills for Chinese Medical Students

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Abstract

History taking is an extremely important skill for medical students to master. In China, medical students usually have opportunities to practise this skill on real patients after they have learned diagnostics and basic relevant theoretical knowledge. Today, however, several factors, such as increased enrolment of medical students and the need to ensure patient safety in avoiding stressful doctor-patient relationships may increase both the difficulty and the importance for medical students to develop this skill. In view of these situations, the aim of this study was to introduce one specific teaching method, i.e., role-play activity, in order to help medical students cultivate and practise history-taking and related skills. 52 third-year medical students were divided into two groups. Students in observation group received role-play activity training before interviewing with real patients. Students in control group were taught by traditional methods without the new method intervention. The teaching effects of role-play activities were evaluated via medical records, tests of history taking and theoretical exams, and questionnaire for the observation group. The scores of seven medical case records for each student in the observation group were analysed and were found to be higher than those in the control group. These results showed no significant differences between the two groups in the first and second interview records with real patients in the hospital, but statistically significant differences were found from the third time. The scores on history-taking tests with a standardized patient (SP) were higher in the observation group than in the control group. No significant difference was found between the two groups in their theory exam scores. Results indicated that role-play activity is an effective method for medical students to improve their history-taking skills.

Keywords: medical students, history taking, role-play activity, clinical skills, standardized patient, medical education

1. Background

History taking is considered a basic clinical skill for clinicians. Data obtained from history taking are essential and important for making an accurate diagnosis (Haring, Cools, van Gurp P, van der Meer, & Postma, 2017; Jose, 2012). However, this skill is difficult for students to learn and develop in the beginning (McKenna, Innes, French, Streiberg, & Gilmour, 2011). Lack of time, lack of training and lack of resources are barriers preventing students from improving in this basic skill (Goncalves et al., 2016; Troncon, 2009). Therefore, various teaching methods are introduced to teach students to take a complete medical history. These methods include lectures, using simulated patients, engaging in role-play activity and using videotape to record students' interviews (Keifenheim et al., 2015; Yu et al., 2017).

In China, history taking is taught in the fifth or sixth semester of education for a 5-year or 6-year clinical medicine major (Zhang, Cheng, Xu, Luo, & Yang, 2015; Pan, Cheng, Zhou, Li, & Yang, 2016). The current method of teaching history taking in Chinese medical schools mainly includes two parts: theoretical study and bedside practice. Teachers give lectures in the classroom, and then students practise on real patients in the teaching hospital. In our practice, we have found that history taking remains difficult for beginners. The main problems include initially

feeling nervous about communicating with real patients, lacking communication skills, and forgetting items when taking histories; therefore, students usually become flustered when facing real patients in the ward for the first time.

There are also other factors that may influence improvement in the history-taking curriculum in China. First, increasing numbers of students have entered medical schools in the last decade, indirectly leading to a shortage of teachers and hospital resources (Lian, & He, 2013). On the other hand, the conflict between doctors and patients in China is a widespread phenomenon (Yao et al., 2014; The Lancet, 2010). It also influences clinical teaching and learning effects. Accordingly, bedside practice with real patients for history taking is recommended to ensure student proficiency and patient safety. Some study data have also suggested that history taking is still a weakness in Chinese medical students' clinical skills. Thus, in the National Clinical Skills Competition, which has been held in China by the Research Center of Clinical Medical Education of the Ministry of Education every year since 2010, history taking is still an essential competence assessed (Jiang et al., 2016) . The average score for history taking in the third national clinical skills competition in Hubei division was 4.98 out of 10 points (see e.g., Wang, 2013). In the seventh competition in the South division, the average score for history taking was 5.86 out of 10 points (unpublished data). Consequently, it is necessary to explore a new and effective training method to improve history-taking skills for medical students, even in a small area.

Role-play activity has been widely used to teach and learn history taking in medical schools and has usually been integrated into other pedagogics in order to increase students' comprehensive clinical abilities. Several studies have shown that role play is a very effective method to enhance students' history-taking skills (see e.g., Schweickert, & Heeren, 1999; Skelton, & Matthews, 2001; Fitzgerald, Crowley, Greenhouse, Probert, & Horner, 2003; Wiskin, Roberts, & Roalfe, 2011). In China, Zhu et al. also used this teaching method in fourth grade students, the results showed that students who accepted the teaching method had higher scores in history taking and medical record writing (see e.g., Zhu, Qiu, Qu, Xue, & Yan, 2014).

In this study, role-play activity was introduced and implemented in third-year students with a clinical medicine major in order to improve their history-taking and relevant skills. This research explored many new and specific training methods, including doctor and patient roles, evaluator performance, group discussion, clinical scenario settings in combination with real bedside teaching, and teachers' debriefing. Formative and terminal assessments in medical case records and practical history-taking tests were used to assess this new teaching method.

2. Methods

2.1 Participants

This explorative study was carried out at the First Affiliated Hospital of Jinan University in Guangzhou, located in southern China. After experiencing the basic medical curriculum for 2 years, students in our hospital began the clinical curriculum "Basic Clinical Skills" in their fifth semester of clinical education; this curriculum included chapters on history taking and common symptoms. The main goal of this course is to instruct students to master history-taking items and methods, the diagnostic process and related clinical thinking and definition, aetiology, clinical manifestations, and key points of common symptoms. All students had previously completed basic medical sciences and compulsory courses in doctor-patient communication.

During the academic year 2016-2017, 52 junior medical students were randomized into an observation group (n=25) and a control group (n=27).

2.2 Course Arrangement

The course consisted of two parts: theoretical study and practical training. The theoretical study portion occurred weekly from the 1st week to the 8th week, totalling 18 teaching hours. The content of this part included history taking and common symptoms. The practical training began in the 6th week, covering 36 teaching hours. Students in both groups were interviewed with real patients in seven different specialties in the internal medicine department. The observation group received specific and additional role-play activity training on history taking before conducting interviews with real patients, whereas the control group followed the traditional teaching method. All clinical knowledge and skills were taught by the same faculty staff team in both the observation group and the control group. The content and arrangement of the theoretical study and practical training are listed in Table 1.

Table 1. Course outline and arrangement

Contents	Minutes	Teaching methods
History Taking	90	lecture
Fever, Edema, Loss of Body Weight	90	lecture
Cough and Expectoration, Haemoptysis, Dyspnoea	90	lecture
Palpitation, Cyanosis, Chest pain	90	lecture
Abdominal Pain, Diarrhoea, Haematemesis, Haematochezia, Jaundice	90	lecture
Headache, Vertigo, Syncope, Tic and Convulsion, Disturbance of Consciousness	90	lecture
Mucocutaneous Haemorrhage, Arthralgia	90	lecture
Frequent Micturition, Urgent Micturition, Odyuria, Oliguria, Anuria, Polyuria, Haematuria	90	lecture
History Taking, medical record	240	practice and discussion
Disease of respiratory system	240	practice and discussion
Disease of cardiovascular system	240	practice and discussion
Disease of digestive system	240	practice and discussion
Disease of endocrine system	240	practice and discussion
Disease of haematological system	240	practice and discussion
Disease of nervous system	240	practice and discussion

2.3 Educational Intervention

Specific and additional settings for role-play activities were given to the observation group. Students in the observation group were trained to role-play in history taking before interviewing with real patients.

Six typical and significant clinical cases (chronic obstructive pulmonary disease, acute myocardial infarction, upper gastrointestinal haemorrhage, diabetes mellitus, rheumatoid arthritis and acute pyelonephritis) were selected and designed as scenarios in accordance with the objectives and requirements of the "Basic Clinical Skill" teaching syllabus. After standardization of these cases, they were used to train students in the observation group. Role-play activities were conducted from the 2nd week to the 5th week, totally 4 teaching hours with one hour per week. Two cases were trained in one course.

During the training and role-play process, 3-4 students formed a group. One student acted as a doctor, one acted as a standardized patient (SP) according to the scenarios, and the other 1-2 students serve as evaluator(s) after the teachers introduced the role-play activities. Finally, debriefing was given verbally by peer classmates and teachers, and teachers summarized the methods and key points of history taking at the end of the class.

2.4 Assessments

Four items were evaluated after this teaching method was implemented.

2.4.1 Assessment of Medical Case Records Written by Students

From the 6th week, both the observation and control groups interviewed real patients in the hospital. In the first beside practice, the teachers helped all students to review the key points of history taking and medical records. After that, each group was subdivided into two groups and guided by the teachers to obtain the history from a real patient. Then, students were evenly divided into 5 small groups, with an average of 5-6 students included after the teachers' demonstration. Each small group took a history from the real patient independently and wrote medical records after class. The teachers were monitoring the students' performance throughout the activity. The standards for grading medical records were established by the researchers according to the content of history taking and the requirements for medical record writing. Two teachers reviewed the medical records according to the checklist (Table 2). An average score for the medical records for each student was calculated. The total score for each medical record was 100.

Table 2. Evaluation standards for medical records

Contents	Standard score
Data gathering	
1. General information	6
2. Chief complaint	10
3. History of present illness	50
4. Past medical history	8
5. Symptoms' review in each system	5
6. Personal history	4
7. Marital history	2
8. Family history	2
Format and writing skills	
9. Standardized format	2
10. Medical terminology	2
11. Legible handwriting	2
12.The duration of the main complaint is consistent with the present medical history	2
14. Logical order	4
15. Signature	1
Total	100

2.4.2 Practical Tests of History Taking

A three-station Objective Structured Clinical Examination (OSCE) was conducted for students in the final evaluation. One OSCE station focused on history taking. Each student completed a 10-minute interview with a teacher standardized patient (TSP). Ten scenario cases of different disorders were provided to students, who selected a case randomly. The evaluation standards for history taking are shown in Table 3.

Table 3. Evaluation standards for history taking

Contents	Standard score
Commencement of the interview	
1.Greeting of patient and identification	2
2. Introduce self and state the purpose for interview	2
Total history	
3. General data	6
4. Main complaint	16
5. Present history	36
6. Past history	6
7. Symptoms' review in each system	10
8. Personal history	2.5
9. Marital history	1.5
10. Family history	2
Communication skill	
11. Communicated with open-ended and closed-ended questions, encourage patient to express concerns	3
12. Ask clear, unambiguous questions, avoid medical jargon	3
13. Avoid leading questions and strings of questions	2
14. Avoid interrupting the patient	1
15. Appropriate eye contact	1
16. Place questions in logical order	2
Conclusion	
17. Summarize patient's statement	2
18. Thank patient and explain the next step	2
Total	100

2.4.3 Theoretical Examination

At the end of the semester, a theoretical examination that included history-taking and symptomatology-related knowledge was held. The assessment focused on students' mastery of basic definitions, understanding and abilities, and flexible analysis of clinical problems. The paper included four major parts: medical terms (10%), filling in the blanks (10%), single-best-answer multiple choice questions (50%), and long questions and case analysis (30%). The total score was 100. Standard answers and scoring criteria for all questions were established based on reference textbooks. Teachers' evaluation of the papers was blinded and objective.

2.4.4 Feedback Questionnaire

A feedback questionnaire was given to evaluate this teaching method. After the final examination, students in the observation group were asked to fill in a brief questionnaire about their perceptions of this teaching method and their satisfaction. The questionnaire consisted of 6 questions based on dichotomous responses (yes/no).

3. Ethics Approval and Consent to Participate

The practice component is a part of the course. Our intervention was non-invasive and had no influence on patients. Therefore, ethical approval was not needed.

All students in the observation group were provided with written information about the study and informed that they could withdraw at any time. Students signed informed consent forms and a confidentiality agreement.

4. Statistical Analysis

Analysis was performed using SPSS version 16.0. Qualitative data were expressed as numbers and percentages. Quantitative data were expressed as the means and standard deviations (SDs). The baseline characteristics, scores for medical records and examinations of the two groups were compared by using a *t*-test. Categorical variables were compared using the Pearson chi square test. Significance was defined at $P < 0.05$.

5. Results

5.1 Basic Characteristics of Students

There were 13 male and 12 female students and 12 male and 15 female students in the observation and control groups, respectively. There was no significant difference in the distribution of gender between these two groups ($\chi^2 = 0.297$, $P = 0.586$).

In terms of mean age, score for doctor-patient communication and the grade points for first-year and second-year between the observation group and control group, the differences were not statistically significant ($P = 0.982$, $P = 0.167$, $P = 0.941$ and $P = 0.314$, respectively). The basic characteristics of the students are shown in Table 4.

Table 4. Basic characteristics of students

	Observation group (n = 25)	Control group (n = 27)	P value
Male/Female	13/12 (52%/48%)	12/15 (44.4%/55.6%)	0.568
Age	21.61±0.70	21.64±0.81	0.982
Score of doctor-patient communication	87.5±3.96	84±4.80	0.167
Grade point			
First-year	2.95±0.41	2.99±0.55	0.941
Second-year	2.78±0.56	3.06±0.57	0.314

5.2 Comparison of the Two Groups' Results in Medical Records and Examinations

The scores for medical records in the observation group were higher than those in the control group. However, there were no significant differences between these two groups in their first and second interviews with real patients ($P = 0.083$ and $P = 0.158$, respectively). From the third to the seventh interviews, differences were found between the two groups (Table 5 and Figure 1).

Compared to the score for the control group (72.05 ± 12.08), the score for history taking with TSP in the observation group was higher (79.34 ± 9.43). A statistical difference was found between the two groups ($P = 0.007$) (Table 5 and Figure 2).

Comparison of theory examination result showed that the score in the observation group (74.06 ± 5.66) was higher than that in the control group (69.88 ± 10.98). However, the difference between the two groups was not significant ($P = 0.054$) (Table 5 and Figure 3).

Table 5. Comparison of the two groups' results in medical records and examinations

Contents	**Observation group (n = 25)**	**Control group (n = 27)**	***P* value**
Medical records			
1	61.93 ± 12.79	56.87 ± 11.80	0.083
2	66.39 ± 7.01	63.62 ± 9.29	0.158
3	68.33 ± 10.68	61.88 ± 12.28	0.026
4	70.90 ± 7.66	64.32 ± 7.57	0.001
5	71.62 ± 5.50	66.06 ± 5.75	0.008
6	78.37 ± 4.45	68.48 ± 4.60	0.000
7	82.53 ± 4.44	74.24 ± 5.54	0.000
History taking	79.34 ± 9.43	72.05 ± 12.08	0.007
Theory examination	74.06 ± 5.66	69.88 ± 10.98	0.054

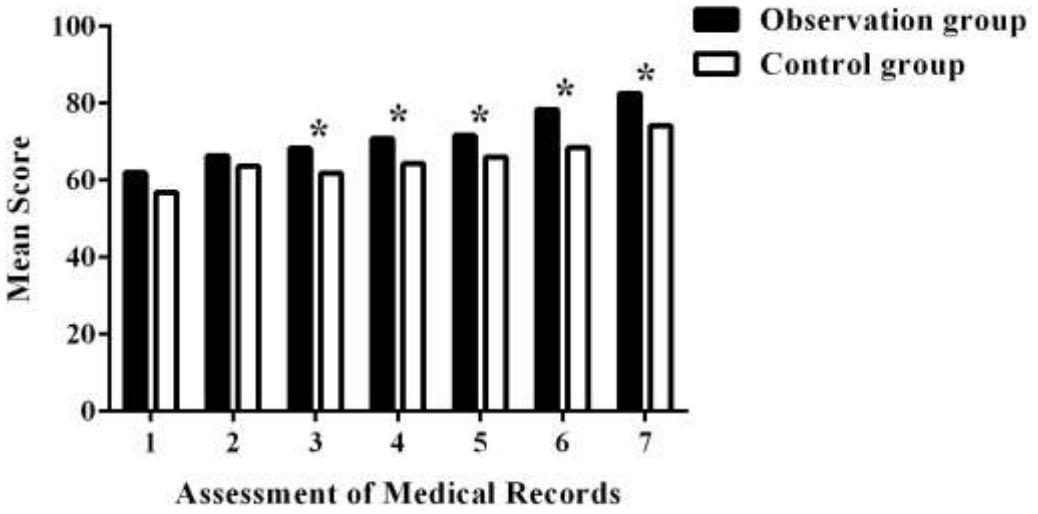

Figure 1. Comparison of the two groups' results in the medical records (*$p < 0.05$).

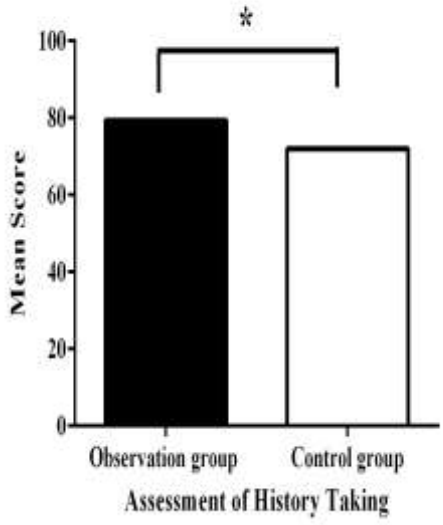

Figure 2. Comparison of the two groups' results in the examination of history taking (*$p < 0.05$).

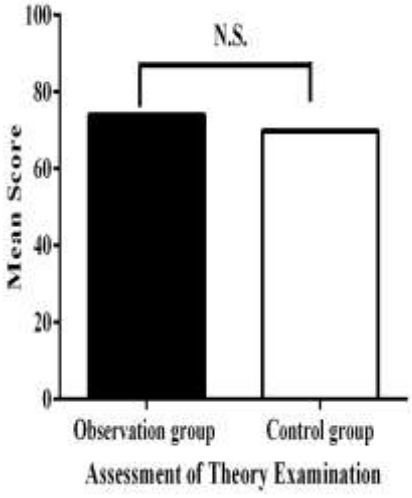

Figure 3. Comparison of the two groups' results in the examination of theory (N.S.: No significance).

5.3 Questionnaire of Students' Evaluation

From the questionnaire, students expressed that the role-play activity was helpful for training on history taking. Specifically, 96% (24/25) of the students stated that the activity improved their history-taking skills, and 92% (23/25) of the students stated that this activity increased their confidence in communicating with real patients. They considered the role-play activity to be an effective way to learn history taking, and they were interested in this teaching method. The role-play activity also increased students' motivation to study history, including 84% (21/25) of the students. Eighty percent (20/25) of them reported that the activity increased their ability to write medical records. More details from the questionnaire are illustrated in Figure 4.

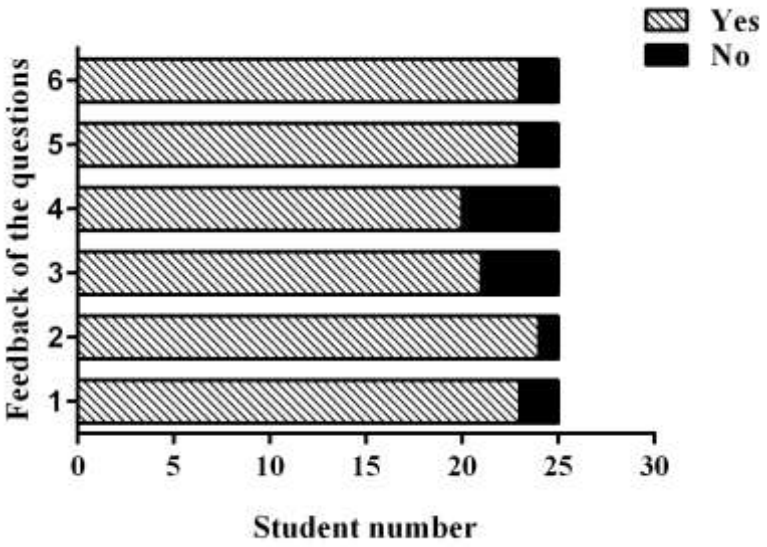

Figure 4. The questionnaire on students' evaluation.

1-6: The bar charts showed the questionnaire results about the following questions. (1) The activity increases my confidence to communicate with real patients. (2) The activity improves my history taking skills. (3) The activity increases my motivation to study history taking. (4) The activity increases my ability to write medical records. (5) I consider this method to be an effective learning style. (6) I am interest in this teaching method.

6. Discussion

In this study, role-play activity was introduced and explored to train medical students in history taking in a practical course. The teaching effects were satisfactory based on the assessment of medical case records written by the students, history-taking tests and questionnaire feedback investigations. The scores for medical records and practical tests of history taking on SP were higher in the observation group than in the control group. These results indicated that the role-play activity was an effective teaching method for students to collect clinical data and communicate with patients.

History taking is one of the most important clinical skills to teach and assess in medical education (Dare, Cardinal, Kolbe, & Bagg, 2008). Studies have proven that history-taking and interview skills should be trained using effective teaching methods (see e.g., Peltier et al., 2007; Losh et al., 2005; Von Lengerke, Kursch, Lange, & APG-Lehrteam, 2011). Methods for assessing these teaching progress have included the OSCE, questionnaires, interviews with SP or real patients, written examination and so on (Keifenheim et al., 2015; Yu et al., 2017). In this study, the ability to gather data and communicate with real patients was emphasized and cultivated in an authentic way. Multi-level indexes were used to evaluate the role-play activity and teaching effects.

Medical case records were first evaluated because they are considered to be very important materials for clinical teaching and research. Furthermore, it's a very important evidence in medical disputes (Liu, 2014). The quality of medical records is one of the methods for evaluating teaching effectiveness in clinical internship (Ma, & Zhang, 2013). This study showed that the scores for the medical records in the observation group were higher than those in the control group. In particular, the scores in the observation group were significantly higher than those in the control group from the third to the seventh interviews with real patients for history taking. No significant differences were found in the first and second interviews in bedside practice. The reason for this result is that some time was needed even for the observation group to master and adapt history-taking skills because real patient illnesses were complicated and changeable. However, the observation group took less time to collect complete and definitive data and communicated with real patients more smoothly.

Second, the scores for practical history-taking tests with TSP in the final examination were also higher in the observation group than in the control group. This result implied that students mastered the content and skills of history taking better after having received role-play activity training. The result demonstrated that this new and specific activity was effective in improving history-taking skills for medical students. Troncon (2009) implemented

role-play activity to increase students' motivation to study history taking. Students benefited from this programme; a few students even perceived that the role-play activity greatly improved their techniques before they interviewed real patients.

Several other studies also introduced a role-play activity to practise history-taking and communication skills. These projects were usually combined with interviewing SP and real patients. Feedback and discussion were provided by group members and staff. Evans, Coman, and Goss (1996) evaluated specialized consulting skills training by using a role-play activity and SP. The results showed that trained students had significantly better communication, problem processing and summary skills. Mukohara et al. (2004) implemented a two-day seminar on medical interview and communication skills; in this study, students in the intervention group reviewed a trigger videotape of the doctor-patient encounter and then practised these skills via role play and videotape review. Differences were found between the intervention group and control group in the ability to "explore how the problem affects the patient's life". Eoaskoon, Sumawong, and Silpakit (1996) conducted SP interviews, role play and feedback to assess the effect of training in history taking. The result of questionnaire indicated that the program was useful for students. In a study about medical interviewing skills (Novack, Dube, & Goldstein, 1992), students practised new skills by using a role-play activity, and they used these skills with friends, family and others. Then, students had opportunities to practise with patients. In fact, role-play activity is widely used for improving history-taking and communication skills. Such activity is effective for medical students, especially when combined with other teaching methods.

In our study, the theoretical examination scores were higher in the observation group than in the control group, but the difference was not significant. One possible reason is that all of the content of the theoretical examination was from books and lectures. In contrast to practice, a theoretical examination mainly depends on memory, whereas history taking is closely related to the situation, the attitudes of patient and doctor, patient's cultural background, patient's education degree and other factors (Keifenheim et al., 2015). This finding also showed that more skills were needed in communicating with real patients.

The results of the questionnaire about students' evaluations of this teaching method were satisfactory for a majority of the students who benefitted from this research. The results revealed high student satisfaction with this method. The activity can increase students' confidence and skills in communicating with real patients. The role-play activity increased their motivation to study history taking. It is an effective strategy to learn history taking, and they were interested in this teaching method.

There are a few limitations of this study. First, in this study, debriefing was given verbally only from peer classmates and faculty staff and mainly depended on direct observation. When time is limited, short, immediate feedback following by direct observation seems to be the most suitable format (Perron et al., 2016). However, some researchers have indicated that feedback based on audiotaped and/or videotaped reviews is superior to verbal feedback alone in the context of communication skills and clinical reasoning (see e.g., Novack, Dube, & Goldstein, 1992; Perron et al., 2016; Ozcakar et al., 2009). A study from Novack, Dube, and Goldstein (1992) reported that the use of audiotaped and videotaped reviews enhanced the learning experience of students. In terms of discussion of clinical reasoning, communication and history taking skills, videotaped interviews and feedbacks were more useful to improve clinical skills (Perron et al., 2016; Ozcakar et al. 2009). We may thus consider introducing videotaped and audio-recording in future research. Second, during practice with real patients, we did not have enough teachers to follow the procedures. We evaluated the results only by considering medical records. If we could evaluate the process of each student, suggestions for students could be given more accurately. Third, in regard to the questionnaire, the questions were all closed-ended, and only two answers were given to choose from, which did not allow much flexibility to identify students' opinions. If rating scales had been used instead of dichotomous responses, then the questionnaire data could have provided a better understanding of the participants.

7. Conclusion

This study showed that students who engaged in a role-play activity had higher scores in medical case records assessment and practical tests of history taking on SP. Students in the observation group were more skilful in their data gathering and interview performance in the hospital. The role-play activity enhanced students' confidence in communicating with real patients. It was an effective method for medical students to improve their history-taking skills. In the future, more typical and significant teaching cases will be collected and designed for medical students to practise history-taking skills by using role-play activity.

Competing interests

The authors declare that they have no competing interests.

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