

Realistic Bedside Consultation Based on Standardized Patients in Nursing Education: A Randomized Controlled Trial

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ABSTRACT

Background: Consultation is the first step of health assessment, and it is an essential skill for nursing students. Clinical real patient practice was the best training method, but it is stressful and challenging for nursing students with little clinical experience. **Objectives:** To compare learning outcomes regarding consultation ability, nurse-patient communication competence, self-directed learning ability, self-efficacy, and nursing professionalism in an undergraduate medical inquiry practice across three teaching methods. **Materials and Methods:** Participants included 94 Chinese nursing students, randomly divided into 3 groups. They received theoretical lessons from the same teacher, with the same objectives. In the practical lesson, the control group ($n=31$) used Peer Role-Play (PRP) practice, whereas the experimental group 1 ($n=32$) received Standardized Patient (SP) practice, and the experimental group 2 ($n=31$) received realistic clinical practice after SP practice. **Results:** The experimental groups had considerable improvements in self-efficacy and independent learning capability than the PRP group after the intervention, and the students who received bedside interview practice based on SP performed better in the test. In addition, they showed higher levels of self-directed learning ability, self-efficacy, and nursing professionalism than the students received SP practice learning only. **Conclusion:** Bedside consultation based on SP has achieved good teaching results in health assessment teaching and comprehensive practical training, which helps to enhance students' inquiry ability and nurse-patient communication competence. It can be applied as a practical teaching model for nursing medical interview training, which needs to be further improved and popularized.

Keywords: Bedside Consultation, Nursing Education, Consultation, Communication, Patient.

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INTRODUCTION

A nurse's ability to assess a client is foundational to practice.¹ Health assessment is the first step of the nursing process, and medical consultation is a critical component of nursing assessment. Medical consultation is a method of eliciting relevant personal, psychosocial and symptom information from clients through a purposeful and planned systematic interview, and then making clinical judgments through comprehensive analysis. It is the main means of medical history-taking. The purpose of the consultation is to obtain the subjective feelings of the clients

on their own health, understand the occurrence, development, diagnosis, treatment and nursing process of the disease, the previous health status as well as the resulting physiological, psychological and social reactions. Specifically, conducting the consultation is the first step of health assessment, and is significant for deriving effective medical data from the beginning of the nurse's face-to-face encounter with the client.

It is not only an essential nursing skill a nurse can possess but also the foundation for other aspects of successful patient evaluation. An accurate history-taking through consultation provides powerful evidence for the physical examination.² Furthermore, nurses can identify nursing problems during the medical inquiry. Along with physical assessment, medical inquiry provides the foundation for the next nursing process step: establishment of nursing diagnosis and nursing plan organization. Studies revealed that caregivers garner 60-80% of the information relevant for a diagnosis^{3,4} and the medical history alone contribute to the final diagnosis in 76%.³



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A consultation is also an important opportunity for nurses to establish a positive therapeutic relationship with clients through effective communication and appropriate interview skills. The success of a consultation depends on how well the practitioner and patient communicate with each other. A good nurse-patient relationship contributes significantly to information collection and the establishment of diagnostic hypotheses.⁵ Most patients build their first impression of a health worker by a strong focus on one's communication style.⁶ However, communication skills are a natural gift with which one was or was not born. Basic communication skills may deteriorate during medical education if the students are not particularly practiced.⁷

In undergraduate nursing education, the primary purpose of the health assessment course is for students to acquire the knowledge and skills of health assessment techniques to develop their ability to assess the health status of a client.⁸ However, when students graduate, they are likely to have theoretical competence but lack practical proficiency. Therefore, to achieve the learning outcomes of the course, in addition to the theoretical knowledge, the ability of communication, observation, analysis and physical examination is also needed to be developed. Specially, mastering inquiry skill is a basic requirement for nursing students, but it is difficult to learn and develop.⁹ It is a proven fact that interview skills can be taught if effective methods are used. At present, inquiry skills teaching include providing a theoretical background and lab practice with students. Previous studies reported the commonly used inquiry practice methods include bedside demonstration, peer role playing, the use of SPs and clinical practice.⁷ Bedside demonstration is conducted by a nursing faculty member with a real patient in clinical and does not require students' participation,¹⁰ which inadvertently affects students' learning experience and learning outcomes. Peer role playing seems to be a convenient method and widely used among nursing students. It allows students to learn skills from each other, but it would only be effective if peers are experienced and knowledgeable.² SP has assumed a fundamental role in nursing practice education, and the use of SPs is an ideal teaching method to practice medical interview.¹¹ A SP is a 'patient-actor' who has been trained to consistently portray a specific patient role, outlined by a script devised by topic content experts.¹² It affords the opportunity to experiment without having to worry about harming real patients, and students can receive immediate feedback and reflection from the SPs. However, the subjective nature of their acting cannot be completely eliminated. It is 'nothing like' the clinical world¹³ and it cannot replace real patient interviews.

An effective method is clinical practice. It provides an opportunity for students to be familiar with the hospital environment, interact with the real patients, and develop inquiry ability. However, for a second-grade baccalaureate nursing student, who do not start their clinical practice, medical inquiry is difficult for them as lack of clinical experience and communication skills.² It is stressful

and challenging for them to interview with actual patients.¹⁴ Moreover, subjecting patients suffering psychological distress to novice interviewers raises ethical considerations.¹⁵

Therefore, the educators may consider taking advantage of SPs and real clinical practice, as they can compensate for each other's limitations, and medical interview skills should be learned in a developmental appropriate, step-wise manner. Nevertheless, few studies were found to explore the teaching method of SP training combined with bedside practice. In addition, most researches were descriptive studies that relied on students' self-evaluation and did not provide evidence that the intervention was effective in improving students' consultation ability. As a result, this study focused on nursing students and aimed to evaluate the effectiveness of realistic bedside consultation practice after SP training with regard to consultation ability and nurse-patient communication competence. Moreover, self-directed learning ability, self-efficacy, and nursing professionalism were also assessed because these indicators are closely related to the humanistic literacy during consultation, and have been used in a variety of studies regarding nursing education practice.¹⁶⁻¹⁸ We hypothesized that bedside consultation practice after SP training can significantly improve students' consultation ability and communication competence, and it can also enhance their self-directed learning ability, self-efficacy, and nursing professionalism.

MATERIALS AND METHODS

Participants

The participants were volunteer undergraduate students in the second year at school of nursing, Yangzhou University. All the students enrolled in the course ($n=94$) "Health Assessment" were invited to be volunteers in the study. They all accepted the invitation and signed informed consent.

Sample size calculation and randomization

The study sample size was determined considering a one-way ANOVA test, a type I error of 0.05, a statistical power ($1-\beta$) of 0.85, and an effect size $f=0.35$ (middle). Using G*Power 3.1.9.6 (University of Dusseldorf, Germany), this study required a total of 93 students, 31 per group. All subjects were randomly assigned to one of three groups in a 1:1:1 ratio using a computer-generated random numbers table. The study diagram is given in Figure 1.

Intervention

Control Group: Peer Role-Play (PRP) practice

The students were randomly assigned to ten teams (3-4 students per team). In each team, one student served as a patient based on the script provided by the researchers. One student served as a nurse to conduct inquiry, and the other student(s) recorded the 'nurse' performance. At the end of the consultation, the 'patient'

and the recording student(s) provide feedback for the 'nurse'. Afterward, the students exchanged their roles.

Experimental Group 1: SP practice

The SPs were enrolled through internet among postgraduate nursing students. SP training and assessment were conducted in the following steps: a) the volunteers participated in three lectures of 2 hr duration each. The lecture was conducted using a PowerPoint presentation provided by the researcher, which included assessment of patients, patient simulation and evaluation of nursing students. b) They practiced the scenario algorithm according to the script, including the questions they were required to answer to cope with unexpected situations and provide feedback. c) They were assessed by two nursing experts after training, and 10 volunteers have qualified for the examination. All training process was supervised by an expert working in a qualified SP training institution.

The SP practice was conducted as follows: a) The 10 SPs received prepared scripts 1 week before the practice. b) They were required to simulate cases based on the scripts. c) the students served as 'nurses' and performed consultation. d) The SPs provide feedback after the practice. A total of ten teams participated, with each team consisting of 3-4 students. In each team, one student participated in the consultation simulation while the others observed the simulation, and vice versa. The running time of the complete simulation was 180 min.

Experimental Group 2: Bedside practice after SP training

The group consisted of ten teams. Each team had 3-4 students. The students participated in the same SP-based consultation practice likewise as the experimental group 2. After that, the students were arranged to hospital to conduct clinical inquiry on real patients. Patients and their families were informed in advance before the study was carried out, and informed consent was obtained. During the practice, one student in the team was required to complete a clinical interview with the patient, and the other students recorded and supplemented the information. When one finished, they exchanged their roles. The session took 45 min to complete. Table 1 shows the practice process.

Data collection tools

The primary outcomes were consultation ability and communication competence, and the secondary outcomes were self-directed learning ability, self-efficacy and nursing professionalism. Five instruments were used to collect data. A demographic questionnaire was administered to collect data including age and gender. The Scale of Self-Directed Learning Ability, General Self-Efficacy Scale, and Nursing Professionalism Inventory were administered to participants before and after

the intervention. In addition, nurse-patient communication competence and consultation ability were tested in the final examination using Nurse-patient Communication Competence Rating Scale and Consultation Ability Assessment Form respectively.

Consultation Ability Assessment Form (CAAF)

The Consultation Ability Assessment Form was originally developed by Lu *et al.*¹⁹ The modified instrument was validated by two nursing education experts (ZP and LY) and one clinical nursing expert (JJ). It was designed to measure nursing students' consultation ability. The instrument consisted of 36 items, representing three core consultation ability domains: consultation procedure (26 items), communication procedure (6 items) and terminal quality (4 items). All items were scored utilizing a 6-point scoring system, and each item has different weight according to their importance and difficulty. The score of each item was calculated with the following formula: score=actual score/maximum score. The total score range is 0 to 36. The scale had satisfied internal consistency in this study (Cronbach's $\alpha=0.84$).

Nurse-Patient Communication Competence Rating Scale (NPCCRS)

The scale was developed to assess nurse-patient communication ability of nursing students by Xu *et al.*, 2008.²⁰ The scale consists of 42 items with 6 dimensions including planning and preparation of communication, initiation of the communication, gathering information, providing information, obtaining and understanding the patient's perspective, and closing of the communication. It was evaluated on a 5-point Likert scale with 1=strongly disagree to 5=strongly agree. The sum of the scores ranged from 42 to 210. A higher score indicates better nurse-patient communication competence. It has been shown to have good reliability and validity with overall scale Cronbach's $\alpha=0.953$, split-half reliability=0.965, content validity index=0.920.²⁰

Self-Directed Learning Instrument (SDLI) for Nursing students

The SDLI is a valid and reliable instrument for identifying SDL abilities of nursing students. It was developed by Cheng SF *et al.*, 2010.²¹ Wu²² modified the instrument and applied it on mainland nursing students. The SDLI consists of 20 items across the following 4 domains: learning motivation, planning and implementing, self-monitoring, and interpersonal communication, using a Likert 5-level score (from 1=strongly disagree to 5=strongly agree), with a total score of 20 to 100 points. The higher the score, the stronger the SDL ability. The mainland version of SDLI showed good reliability and validity. The Cronbach's α coefficients, split-half reliability coefficient and test-retest reliability for the instrument were 0.914, 0.827 and 0.913 respectively.²²

General Self-Efficacy Scale (GSES)

The Chinese version of the General Self-Efficacy Scale (GSES) was used in this study. It was originally developed by Schwarzer *et al.*,²³ Wang *et al.*,²⁴ translated and revised it into Chinese in 2001. The Chinese GSES is a one-dimensional scale with 10 items on a 4-point Likert scale (1=not at all true, 2=barely true, 3=moderately true and 4=exactly true). The final score was computed by summing all items (scores ranged 10-50). A higher score indicates a better general self-efficacy. It has good reliability (Cronbach's $\alpha=0.87$, test-retest reliability=0.83) and validity.²⁴

Nursing Professionalism Inventory (NFI)

The Chinese version of Hall's Professionalism Inventory was used to assess nursing professionalism. It was developed by Professor Richard Hall²⁵ to determine suitable criteria and measure a person's professional standing. Chinese version of the inventory was adapted by Wu²⁶ in 2019. The Chinese inventory contains six subscales, including professional organization (3 items), public service (5 items), self-discipline (3 items), autonomy (2 items),

sense of mission (4 items) and job satisfaction (3 items). Each item was rated on a five-point Likert-type scale. The higher the score, the higher the level of nursing professionalism. It was applied to Chinese nursing students with good reliability (Cronbach's $\alpha=0.75$, test-retest reliability=0.84) and validity.²⁶

Data collection

For the initial survey, participants' information regarding the general characteristics, self-directed learning ability, self-efficacy and nursing professionalism were collected using a self-reported questionnaire before the study. Immediately after the end of the intervention, all the participants were required to take part in a practice examination. In the examination, a SP was used to mimic a patient with appendicitis according to a standard script. Students' consultations with SP were assessed by an examiner who was blinded to whether a student was in the control or experimental group, using Nurse-patient Communication Competence Rating Scale and Consultation Ability Assessment Form. After the examination, the students were asked to complete

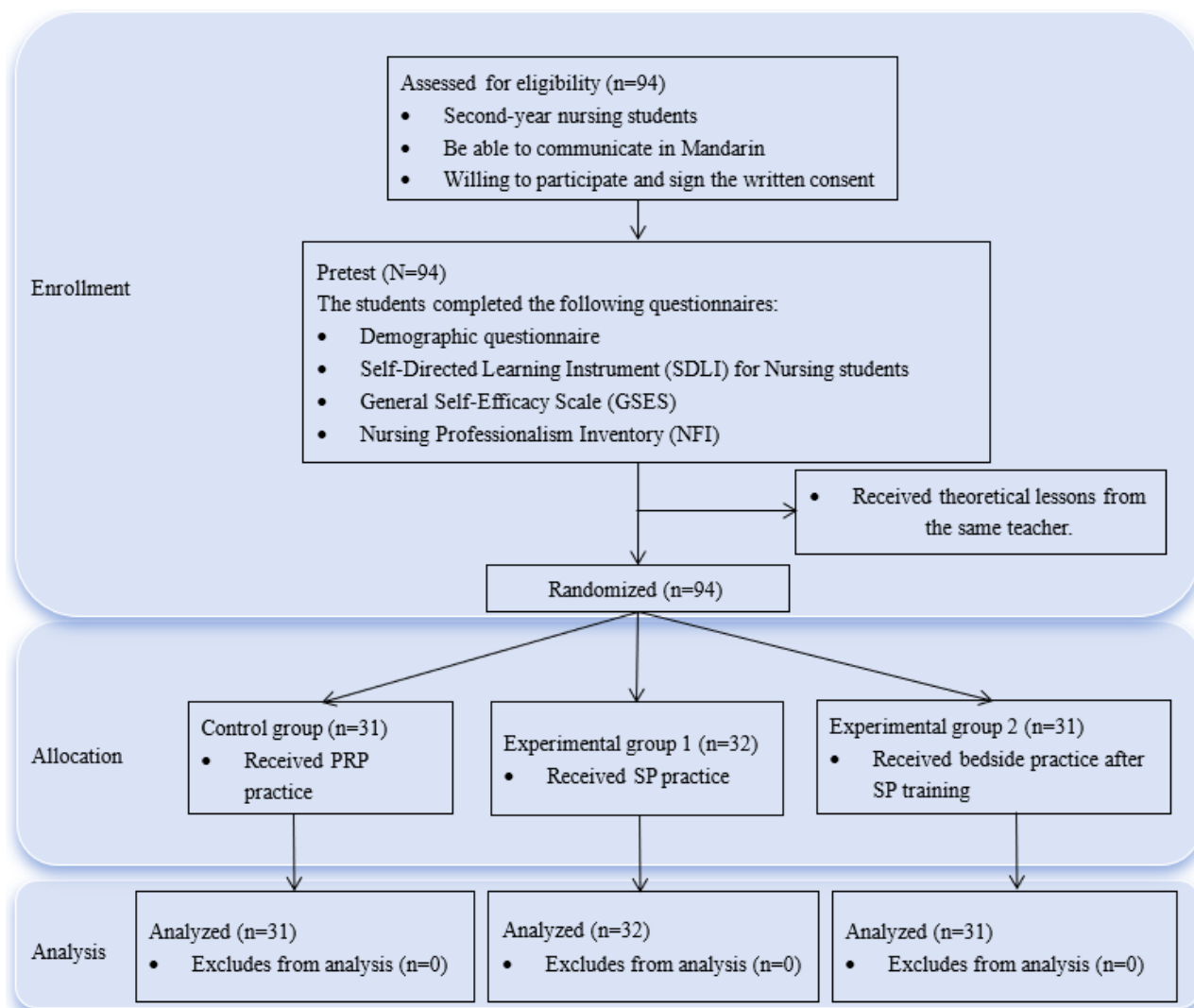


Figure 1: Flow diagram of sample randomization and allocation process.

Table 1: Education program design.

PRP practice		SP practice		Bedside practice after SP training	
Contents	Time	Contents	Time	Contents	Time
- Lectures (10 sessions) -Definition of consultation. -Purpose of consultation. -Consultation methods and techniques. -Consultation of common symptoms.	450 min	- Lectures (10 sessions) -Definition of consultation. -Purpose of consultation. -Consultation methods and techniques. -Consultation of common symptoms.	450 min	- Lectures (10 sessions) -Definition of consultation. -Purpose of consultation. -Consultation methods and techniques. -Consultation of common symptoms.	450 min
- Skill practice -Each team consisted of 3-4 students. -One student served as a patient, one student served as a nurse to conduct consultation, and the other student(s) recorded the 'nurse' performance. -The 'patient' and the recording student(s) provide feedback for the 'nurse'. -The students exchanged their roles.	180 min	- Skill practice -Each team consisted of 3-4 students. -The SPs simulated cases based on the scripts. -The students served as 'nurses' and performed consultation, the others observed the simulation. -The SPs provide feedback after the practice. -The students took turns participating in the simulation.	180 min	- Skill practice -Each team consisted of 3-4 students. -The SPs simulated cases based on the scripts. -The students served as 'nurses' and performed consultation, the others observed the simulation. -The SPs provided feedback after the practice. -The students took turns participating in the simulation. -The students were arranged to the hospital to conduct clinical inquiry on real patients. -During the practice, one student performed a clinical interview with the patient, and the other students recorded and supplemented the information. -The students took turns completing the inquiry.	225 min
- Examination -A SP was used to mimic a patient with appendicitis. -Students completed inquiry with the SP independently. -A trained examiner assessed the participants' performance.	10 min/student	- Examination -A SP was used to mimic a patient with appendicitis. -Students completed inquiry with the SP independently. -A trained examiner assessed the participants' performance.	10 min/student	- Examination -A SP was used to mimic a patient with appendicitis. -Students completed inquiry with the SP independently. -A trained examiner assessed the participants' performance.	10 min/student

* PRP: Peer Role-play, SP: Standardized Patient.

an evaluation of self-directed learning ability, self-efficacy and nursing professionalism with Scale of Self-Directed Learning Ability, General Self-Efficacy Scale, and Nursing Professionalism Inventory, respectively.

Statistical Analyses

Statistical analysis was carried out using IBM SPSS 27.0 (IBM Corporation, New York, NY, USA). Kolmogorov-Smirnov normality test was used to determine if there was a normal distribution of data, and the continuous variables were represented as mean and Standard Deviation (SD) if samples followed a normal distribution. Comparisons of general characteristics among three groups were performed with Analyses of Variance (ANOVAs) and Chi-squared tests. Paired sample *t*-test was used for comparing the difference before and after the intervention. *Post hoc* analysis was conducted using the Bonferroni correction provided by the statistics package used. *p*-values have been corrected for multiplicity control. A statistical difference was set at $p < 0.05$ (two-tailed). An independent statistician performed the analysis to prevent any bias during analysis of the data.

Ethical considerations

The study protocol was approved by the Ethics Committee of School of Nursing, Yangzhou University (Ethic No. YZUHL20220119) on 1st June 2022. It strictly followed the Declaration of Helsinki. All participants were informed of the aim and significance of the study. Participants were informed that participation was voluntary and they could withdraw or refuse to participate at any time without any consequences. In addition, all the data collected were confidential and used for research only. They were free to withdraw from the study at any time. A signed written informed consent form was needed if they agreed take part in the study. The study has been registered on clinicaltrials.gov (ChiCTR2300071731).

RESULTS

Characteristics of the participants

A total of 94 nursing students with an average (SD) age of 19.3 (0.64) years were enrolled in the study and were divided into 3

groups: 31 in the control group, 32 in the experimental group 1, and 31 in the experimental group 2. All the students completed the study protocol and were analyzed. Of all the participants, 79 students were male and 15 were female. The mean age of the subjects in the control group, experimental group 1 and experimental group 2 was 19.32(0.75), 19.19(0.54) and 19.39(0.62) years, respectively. There were no significant differences in the demographic characteristics among the three groups. The general characteristics of the students are shown in Table 2.

Consultation Ability

As shown in Table 3, in the examination, the scores of CAAF of experimental group 2 ($M=32.58$, $SD=3.18$) were significantly higher than the control group ($M=26.80$, $SD=4.83$) and the experimental group 1 ($M=29.55$, $SD=5.01$) ($F=13.231$, $p<0.001$). In addition, the students who received SP practice scored, on average, 2.75 points higher on the CAAF than the students who received PRP practice ($p<0.05$). Those students who had practiced with a SP scored significantly better on measurements of consultation ability than those who had not (Table 3).

Nurse-patient communication competence

Regarding the teaching effectiveness of nurse-patient communication competence, *F* tests indicated that the total NPCCRS mean score of 192.55 ($SD=7.18$) for the experimental group 2 was significantly higher than the control group ($M=162.97$, $SD=18.69$) and the experimental group 1 (173.88, $SD=17.00$) ($F=30.104$, $p<0.001$). In addition, the students who received SP practice scored, on average, 10.91 points higher on the NPCCRS than the students who received PRP practice ($p<0.05$). Those students who had practiced with a SP scored significantly better on measurements of communication skills than those who did not (Table 3).

Self-Directed Learning Ability

Prior to the training, there were no significant differences in the score of SDLI among the three groups ($F=0.811$, $p=0.448$). Following the practice, an increase in the scores was found, with 6.48, 3.09 and 9.97 points, on average, higher than pre-intervention in the control group ($t=-3.972$, $p<0.001$), the experimental group

Table 2: General characteristics of the students.

Variables	Control group (n=31)	Experimental group 1 (n=32)	Experimental group 2 (n=31)	F/X ²	p
	M±SD or n (%)	M±SD or n (%)	M±SD or n (%)		
Age (year)	19.32 (0.75)	19.19 (0.54)	19.39 (0.62)	0.806	0.450
Gender					
Female	25 (80.6)	28 (87.5)	26 (83.9)	0.553	0.759
Male	6 (19.4)	4 (12.5)	5 (16.1)		

Effects of three education methods among three groups.

Table 3: Comparison of consultation ability and nurse-patient communication competence among three groups.

Variables	Control group (n=31)	Experimental group 1 (n=32)	Experimental group 2 (n=31)	F (p)
Consultation ability.	26.80 (4.83)	29.55 (5.01) ^a	32.58 (3.18) ^{a,b}	13.231 (<0.001)
Consultation procedure.	19.44 (3.46)	21.24 (3.77) ^a	23.35 (2.51) ^{a,b}	10.959 (<0.001)
Communication procedure.	4.58 (0.98)	5.06 (0.87) ^a	5.62 (0.62) ^{a,b}	11.991 (<0.001)
Terminal quality.	2.77 (0.81)	3.25 (0.59) ^a	3.60 (0.46) ^{a,b}	13.038 (<0.001)
Nurse-patient communication competence.	162.97 (18.69)	173.88 (17.00) ^a	192.55 (7.18) ^{a,b}	30.104 (<0.001)
Planning and preparation of communication.	24.19 (3.32)	25.63 (2.69) ^a	28.35 (2.15) ^{a,b}	18.195 (<0.001)
Initiation of the communication.	26.65 (3.96)	28.13 (3.62)	31.26 (2.07) ^{a,b}	15.592 (<0.001)
Gathering information.	42.97 (4.78)	44.81 (4.83)	48.42 (1.98) ^{a,b}	14.229 (<0.001)
Providing information	23.52 (3.88)	25.03 (3.69)	28.42 (1.84) ^{a,b}	18.230 (<0.001)
Obtaining and understanding the patient's perspective.	24.23 (3.04)	25.41 (3.39)	28.61 (2.11) ^{a,b}	18.995 (<0.001)
Closing of the communication.	21.42 (3.97)	24.88 (3.96) ^a	27.48 (1.82) ^{a,b}	24.660 (<0.001)

^a Compared with the control group, $p < 0.05$. ^b Compared with the experimental group 1, $p < 0.05$.

1 ($t = -1.772$, $p = 0.086$) and the experimental group 2 ($t = -7.550$, $p < 0.001$), respectively. Specifically, the students participated in bedside consultation reported higher level of self-directed learning ability than the students participated in the PRP practice and SP practice (both $p < 0.05$) (Table 4).

Self-Efficacy

As for self-efficacy, before the practice, there were no significant differences in the score of GSES among the three groups ($F = 0.085$, $p = 0.919$). A significant increase was found after the intervention in the three groups ($F = 11.138$, $p < 0.001$), with 2.10, 2.90 and 7.07 points, on average, higher than pre-intervention in the control group ($t = -2.507$, $p = 0.018$), the experimental group 1 ($t = -4.916$, $p < 0.001$) and the experimental group 2 ($t = -9.675$, $p < 0.001$), respectively. Additionally, the students received real patients' inquiry training reported higher level of self-efficacy than the others (Table 4).

Nursing Professionalism

Regarding nursing professionalism, before the training, no significant differences were found among the three groups ($F = 0.504$, $p = 0.606$), whereas after the training, all the subjects reported considerably higher scores of NFI (all $p < 0.05$). These findings represent a significant improvement in nursing professionalism from pre-to-post practice. Moreover, the students who experienced real patient interview perceived higher level nursing professionalism than the students who did not (Table 4).

DISCUSSION

The study investigated the effect of realistic bedside medical inquiry after SP training among nursing students. The results indicate that it is beneficial for the participants to enhance medical inquiry ability and communication competence. As part of the health assessment, medical history-taking through inquiry is critical to identify health care priorities and implement appropriate interventions, and it is also a powerful diagnostic tool available to the nurses. Communication is a basic element in medical inquiry, affecting outcomes for nurses and patients. The increasing demand for nursing students to be trained to communicate effectively has seen the emergence of interpersonal communication skills as core competencies for nursing students in medical training around the world.²⁷ Interview skills contribute significantly to history-taking, problem identification, diagnostic accuracy, patient adjustment to stress and illness, patient recall of personal information, patient satisfaction, patient adherence and health outcomes.²⁸ Additionally, effective communication is vital for nurse-patient relationship, information gathering and care plan development. Therefore, nursing educators are responsible for training nursing students to conduct effective medical consultation after graduation.

We found a considerable increase of CAAF and NPCCRS scores in the experimental groups compared with the control group, and the students participated in the bedside inquiry performed better than those who participated in the SP practice. SP role-play has been considered by medical educators to be the gold standard for teaching communication skills. It provides an opportunity for new nursing students to learn consultation and communication skills in a controlled environment, as a bridge between the 'classroom and clinic'. Previous study has also demonstrated that

Table 4: Comparison of SDLI, GSES and NFI scores among three groups before and after the intervention.

Variables	Groups	Pre-intervention	Post-intervention	t (p) ^a	F (p) ^b	F (p) ^c
SDLI	Control group	70.19 (8.92)	76.67 (6.91)	-3.972 (<0.001)	0.811 (0.448)	9.318 (<0.001)
	Experimental group 1	72.53 (8.97)	75.62 (7.47)	-1.772 (0.086)		
	Experimental group 2	72.61 (7.55)	82.58 (6.13) ^{*,**}	-7.550 (<0.001)		
GSES	Control group	25.19 (4.85)	27.29 (4.31)	-2.507 (0.018)	0.085 (0.919)	11.138 (<0.001)
	Experimental group 1	24.88 (4.41)	27.78 (4.00)	-4.916 (<0.001)		
	Experimental group 2	24.74 (4.04)	31.81 (4.12) ^{*,**}	-9.675 (<0.001)		
NFI	Control group	51.19 (8.48)	58.16(5.68)	-5.673 (<0.001)	0.504 (0.606)	9.379 (<0.001)
	Experimental group 1	53.38 (6.70)	61.15 (6.52)	-4.924 (<0.001)		
	Experimental group 2	52.64 (10.70)	65.16 (6.88) ^{*,**}	-8.635 (<0.001)		

^a Paired *t*-test for mean differences between pre- and post intervention within groups; ^b Difference between groups before intervention; ^c Difference between groups after intervention. * Compared with the control group, $p<0.05$. ** Compared with the experimental group 1, $p<0.05$.

teaching with SP promoted better acquisition of communication skills than alternative didactic or interactive methods, such as reviewing one's own recorded performance.¹³ SPs help students to integrate theoretical knowledge, and provide structure that prepares students for the realistic clinical environment and patient encounter. When the students participate in SP practice, the SPs may instruct them to conduct consultation when they forget some important information. In addition, the SPs would provide personalized feedback from the perspective of a patient as well as a teacher for each student. A systematic review reported programs that include tailored feedback probably improve medical students' overall communication skills more than programs that involve general or no feedback.²⁷ Dubois *et al.*²⁹ also emphasized the importance of feedback for students to realize what level of knowledge and ability they possess. A specific behavior-oriented feedback significantly improved students' self-evaluations, and, at the same time, the communication skills were also enhanced.³⁰ Repeated SP interactions had also contributed to students' development of consultation performance.¹² Based on the SP consultation, they were more confident and knew how to implement inquiry when they turned to clinical bedside. However, unlike the SPs, the patients were unaware of the consultation procedure, so they would not answer the questions as the students expected. Some patients may talk a lot about other irrelevant topics, or cry, even refuse to answer some questions, etc. Therefore, the student needs to find their own ways to deal with the situation. They have to learn how to develop rapport with the patients in clinical and

respond to changing dynamics during the medical interviews,³¹ which has greatly improved their consultation ability and communication skills while addressing these challenges. Good nursing-patient communication is the foundation of effective medical consultation. Bedside learning allowed the students to practice clear and empathetic communication with patients, thus enhancing their ability to establish meaningful connections.³² In the examination, we found that students in the experimental group 2 asked relevant questions and structured their interviews with 'patients' well. Furthermore, they were better at responding appropriately to verbal and non-verbal cues of the 'patients'. Therefore, they were able to elicit greater quantity and quality of information.⁷

The study demonstrates that all the three groups had better SDLI, GSES and NFI scores after practice, as routine lab practice improved the self-directed learning ability, self-efficacy and nursing professionalism of the nursing students. Through different case situations, participants had more opportunities to discover problems in practice and tried to solve them, thus their self-efficacy and nursing professionalism were also developed. In addition, the SDLI, GSES and NFI scores of the nursing students practiced with real patients after SP training were higher than those practiced through PRP training and SP-based training only.

The use of PRP with fellow trainees is a general way to practice inquiry and communication skills. It provides a convenient opportunity to train clinical interviewing skills and medical history taking skills. Furthermore, trainees can gain additional

knowledge through experiencing the role of the patient, which may lead to personal reflection, in turn affecting clinical practice.¹³ However, a common complaint is that role-play with peers feels artificial, and some students may feel uncomfortable when conducting role-plays with classmates. In comparison with PRP practice, the application of SPs offers relatively natural 'patient' and environment in terms of helping the students to train inquiry skills. The SPs may raise some related questions, or act as a patient who was difficult to communicate with when the students were unable to continue the interview for several reasons, the SPs would guide them implicitly. In addition, the SPs would provide guidance, highlighting the students' strengths and weaknesses in a supportive manner. For the other individuals who observed and recorded the performance, they would enhance their own learning of skills by referring to the suggestions proposed and their own critical evaluating. Encouraging the students in the practice can assist them to get skills, thus enhancing students' motivation to learn independently, and improving their self-efficacy and nursing professionalism.

After consulting with the actual patients in clinical, the participants gained improved self-directed learning ability, and perceived higher level of self-efficacy and nursing professionalism. Based on the previous SP training, the students had understood consultation procedure and mastered verbal as well as non-verbal communication skills. Therefore, they were able to complete the entire consultation process in clinical. In particular, when the students communicated with real patients in clinical, they were not only students but also 'nurses'. The patients might also ask them a lot of questions related to their disease. When they encountered some medical problems that could not be solved on the basis of present knowledge, they would note down and search for the answers thereafter. Actually, the students identified their own barriers in interviewing patients, and they conducted independent research by referring to relevant literature, which had provided an opportunity for independent learning. One student stated that the patient asked some questions that she did not know and then she kept a record and figured it out by checking out the latest guideline. In addition, bedside practice enables nursing students to interact with patients at a personal level, witnessing their struggles, fears and hopes.³² The patients trusted them and told them a lot about their disease, even their pain, concern, worry, etc. As a result, the participants might understand their feelings, which had also inspired their inner empathy and compassion. Empathy is of great importance for better healthcare outcomes as part of a warm and friendly communication style.³³ It is also an aspect of personality that plays a significant role in interpersonal relationships and promoting communication skills.³⁴

Bird J *et al.*³⁵ pointed out that the main functions of the medical interview were not only gathering health data, but also responding to patients' emotions, educating them, and influencing their behaviour. A good medical consultation should

be patient-centered. With the students' responses, the patients were willing to disclose more history details, and they would ask them for help. For example, one patient who was going to receive a heart bypass surgery was worried about the prognosis. The student comforted her and gave some advice, which has increased the patient's confidence in the surgery. Gyldenvang *et al.*³⁶ found that nurse-led consultations empowered patients to better cope with side effects, and improved patient satisfaction with nurse-led consultations. Feedback from the patients may be helpful for the participants in collecting more diagnostic information. What is more, with the positive feedback from the patients, the students' confidence and self-efficacy were also enhanced. They communicated with the client more naturally instead of feeling nervous and stressful. According to Bandura,³⁷ learning is a triadic interaction of the environment (educational setting), personal factors (self-esteem, dependency, self-efficacy) and behavior of the learner (including cognitive processes). In the clinical setting, nursing students could apply and practice their skills, and were more confident to perform medical interview, which has greatly developed their inquiry ability and communication skills.

After the practice, some students reported that the experience strengthened their choice of nursing profession because they had understood the meaning of "Comfort always". It was really a meaningful and valuable practice. This aspect has improved their sense of professional identity, and motivated them to study harder. For instance, one of the students indicated that 'I didn't seem to realize the importance of a life as deeply as I do now. But when I saw a patient in the hospital, especially one who was suffering from cancer, I suddenly realized that there were a variety of patients who need us. I understand the meaning of nursing.'

There are also several limitations of this study. For one, it is unknown how long the effects of the intervention will last. Future long-term follow-up studies are necessary to verify the long-term effects. Secondly, the SPs were uniformly trained according to a standardized protocol, but there was likely some variation among them when it comes to playing the patient. There was the possibility that no matter how well they are briefed and trained, SPs may choose to play the case differently to how they were asked to do so. In addition to this, it takes time and money on the training, selection and organization of SPs. So, the cost of training and hiring SPs needs to be taken into consideration in the future. Thirdly, the administered questionnaires were self-reported, which might increase the likelihood of self-report bias. In addition, the data came from a single school, which may limit generalizability, and the sample size was not big enough in our study. The duration of the practice was also limited. A larger sample is needed in future studies to verify the results of the study, and explore the appropriate training time. Lastly, for the bedside consultation, it requires a lot of human resources (suitable candidates) and consumes a lot of time (travel time

between school and the teaching hospital). Moreover, the volunteer patients were all kind and willing to communicate, which may have biased the results such that the effect may be overestimated. As a result, the educators need to take these factors into consideration when conducting bedside teaching practice. Despite these limitations, the study highlights the importance of bedside consultation with real patient after SP interview training, which has greatly improved the students' level of inquiry ability and communication competence. Besides, self-directed learning, self-efficacy and nursing professionalism were also enhanced.

CONCLUSION

Consultation ability is the basis for assessment of patients, and is an essential skill for every nurse. As a part of interview ability, communication skills play an important role in building a good therapeutic relationship between nurses and patients. These require not only theoretical lectures but also practice. Consultation training is a step-by-step process that involves initial theoretical knowledge learning, lab practice and real clinical practice. SP is a promising tool in the area of teaching and evaluating students' inquiry ability, and bedside practice was also necessary to enhance students' inquiry skills and communication competence. The usage of SP can relieve the stress caused by insufficient experience, and actual patient interviews after SP training provides good experience for the students as well as bridges the gap between theory and practice. This study provided suggestions for nursing educators to combine SP practice with bedside clinical practice in consultation training, thus better preparing nurses for delivering high-quality patient care in the future.

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ABBREVIATIONS

SP: Standardized patient; **PRP:** Peer role-play; **CAAF:** Consultation Ability Assessment Form; **NPCCRS:** Nurse-patient communication competence rating scale; **LI:** Learning Instrument; **GSES:** General Self-Efficacy Scale; **NFI:** Nursing Professionalism Inventory; **SD:** Standard deviation. **SDLI:** Self-Directed Learning Instrument; **GSES:** General Self-Efficacy Scale; **NFI:** Nursing Professionalism Inventory.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was performed in accordance with the Declaration of Helsinki and the Ethics Committee of the School of Nursing, Yangzhou University (Ethic No. YZUHL20220119).

SUMMARY

Compared with PRP, SP practice deepens the understanding and application of essential knowledge through clinical scenarios. Nursing teachers should arrange for students to be exposed to clinical practice early. Early clinical exposure is beneficial in terms of knowledge mastery, skill application and learning attitude. It can enable students to integrate basic knowledge, clinical experience and nurse-patient communication well in practical scenarios, which helps to enhance students' learning motivation and deepen their understanding of nursing profession. However, there are some limitations. Arranging students to carry out clinical practice activities will require more teachers and time, and require multi-department support and collaboration. In order to better carry out such teaching activities, the above problems should be considered to ensure that students can benefit from clinical practice at minimal cost. Recently, with the development of artificial intelligence technology, new teaching methods regarding consultation are promising.

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