

# Application of Clinical Cases Combined with Students' Standardized Patients in the Teaching of Intravenous Infusion Skills

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## Abstract

**Objective:** To explore the experience and effect of clinical cases combined with students' standardized patients in intravenous infusion nursing practice teaching. **Methods:** 77 nursing students from our college were selected as the research objects. Clinical cases were used in the practice of intravenous infusion nursing, combined with students' standardized patient teaching, and the teaching methods were analyzed through practical assessment and students' self-evaluation, mutual evaluation and teacher evaluation. **Results:** clinical cases combined with students' standardized patients in intravenous infusion nursing practice teaching can improve students' sense of real experience, increase teaching effect and promote the organic combination of theory and practice. **Conclusion:** clinical cases combined with students' standardized patient teaching can improve the students' clinical thinking ability and the ability to solve clinical practice problems, and lay a foundation for taking the post of nurse to solve the practical problems of intravenous infusion operation.

## Keywords

Intravenous infusion; Students standardized patients; Case teaching.

## 1. Situation of Intravenous Infusion and Current Situation of Intravenous Infusion Nursing Practice Teaching in China

### 1.1. Situation of Intravenous Infusion in China

In China, an average of 8 bottles of liquid are infused per person per year [1], 80% of hospitalized patients receive intravenous infusion treatment, and 85% of nurses spend more than 75% of their working time on intravenous treatment. Intravenous infusion treatment has also become a technical operation most practiced by nurses in China [2]. The main purpose of intravenous infusion treatment is to input drugs, supplement water and electrolytes, provide nutrients and increase blood volume. It can achieve rapid curative effect in treating diseases and promoting disease recovery. It is also an important means for hospitals to treat and rescue patients [3]. However, while intravenous infusion treatment benefits patients, complications such as phlebitis, drug leakage, catheter infection, nerve injury and allergic reaction also continue to appear [4]. In the internship season every year, interns enter the clinic, which also increases the risk of intravenous infusion and the occurrence of complications. How to cultivate the students' ability to deal with clinical problems in the practical teaching of intravenous infusion and avoid and reduce the infusion risk as much as possible is a problem worthy of research and exploration in the practical teaching of intravenous infusion nursing.

## 1.2. Current Situation of Intravenous Infusion Nursing Practice Teaching in China

Intravenous infusion nursing practice is the most common operation technology in the operation of practical skills in the basis of nursing. In practical teaching, it is generally completed on the model of classroom. Most students pay attention to the accuracy and process of operation, but lack the ability of clinical thinking.

## 2. SSP Overview

### 2.1. SSP Concept

Student standardized patient (SSP), also known as student simulated patient, means that after training, students play the role of patients in teaching and master the clinical bed related symptoms and signs of patients they want to play [5-8].

### 2.2. Application of SSP in Intravenous Infusion Practice

In the practice teaching of intravenous infusion, clinical cases are combined with students' standardized patients, which aims to simulate the clinical scene, lay the foundation for students before entering the clinical practice, and reduce the infusion risk brought by interns to intravenous infusion patients to a certain extent.

## 3. Object and Method

### 3.1. Participants

77 nursing students of 2018 and 2019 were selected as the research objects. There were 4 boys and 73 girls, with an average age of  $21 \pm 0.2$  years.

### 3.2. Selection and Training of Standardized Patients for Students

Encourage students to sign up voluntarily, and then choose the students with the ability to play the role of patients. The teacher explained the typical clinical cases of intravenous infusion and gave them to the students for preview, so that the students could be familiar with the clinical symptoms and nursing precautions of the patients they want to play, and practiced many times according to the contents of the cases. After passing the teacher's assessment, 8 students were selected as standard patients.

### 3.3. Teaching Method

The cases given mainly include infusion safety problems, including the selection and use of different infusion routes, different infusion sets, appropriate infusion parts, such as scalp needle, indwelling needle, PICC or infusion port, precision infusion set, light proof infusion set or ordinary infusion set; Rational drug use, correct dose, correct route, correct infusion sequence, correct administration time, etc.; Nursing of common complications, such as phlebitis and drug extravasation; Nursing of infusion for special patients and special occasions. For example, after the operation of breast cancer, patients need intravenous infusion. The doctor's advice is 0.9%NS100ml+ ceftazidime 2.0g intravenous infusion Tid, 25% mannitol 125ml intravenous infusion Bid, 5%GS250ml+ water soluble vitamin intravenous infusion QD, get the case SSP need to show signs of breast cancer patients; Students should avoid the limbs on the operation side in the selection of infusion site. In the selection of liquid, they need to infuse TID drugs first, and then bid and QD drugs. In the selection of blood vessels, because 25% mannitol belongs to hypertonic liquid, they can't select the end blood vessels. In terms of drip speed, 25% mannitol needs rapid drip, which is not 40-60 drops / min for adults emphasized in the book. In the selection of infusion set, water-soluble vitamins need to use light proof infusion set, etc.; For example, in case 2, patients with liver cancer were accompanied by superior vena cava

compression syndrome. The doctor's orders were 20% albumin QD, 0.9% ns100ml + glutathione 1.8g, 5% gs250ml + glycyrrhizin 150mg QD, and platelets 200ml intravenous infusion. Getting the SSP of the case needed to show the characteristics of patients with liver cancer and superior vena cava compression syndrome, and students should avoid the upper limbs for superior vena cava syndrome, In the selection of infusion sequence, the principle of "salt before sugar, crystal before glue" cannot be strictly followed. Platelets need to be infused quickly at the first time to prevent bleeding; In addition, in some cases, SSP is set to show the corresponding symptoms of phlebitis and drug extravasation, so that students should make corresponding treatment.

The training course of intravenous infusion operation is three times in total (6 class hours, 270 minutes). The specific arrangement of class hours is as follows: (1) the first class teacher explains the specific clinical cases of intravenous infusion, and SSP cooperates with the teacher to carry out the demonstration and discussion of intravenous operation in combination with the laboratory simulator. Then the students are divided into groups of three, According to the cases of intravenous infusion given by the teacher, the SSP shall be practiced in groups as nurses. Before class, a group of students shall be selected for demonstration, and the teacher shall guide all students to ask questions and comment (2). In the second class, students take groups as units, and each group has an SSP to give students different cases, and let students practice intravenous infusion operation repeatedly for different cases. SSP should show typical clinical characteristics according to the cases given, and the teacher should give guidance in time and point out the existing problems during the operation. (3) In the third class, the students drew lots to assess the operation of intravenous infusion according to the cases drawn, and the teachers and students analyzed and evaluated the assessment results through "self-assessment, mutual assessment and teacher assessment".

## 4. Results

77 students scored more than 85 points in the practice assessment of intravenous infusion, the highest score was 98 points, the average score of operation was  $93 \pm 0.8$  points, and the score was the highest among the 50 basic skill operations.

The self-assessment, mutual assessment and teacher assessment are based on the mastery of theoretical knowledge of intravenous infusion, the familiarity with intravenous operation process and the cooperation of team members. Likert method is used to evaluate. According to the excellent, good, general, not very good and bad, 5 points, 4 points, 3 points, 2 points and 1 point are given respectively, and the average score is  $4.3 \pm 0.5$  points.

## 5. Impact Assessment

### 5.1. Cultivating Students' Clinical Thinking Consciousness

The use of clinical cases and SSP in the practical teaching of intravenous infusion can show the real clinical scene. On the one hand, it enables students to deepen their understanding of the operation of intravenous infusion and changes the students' concept that they only pay attention to the operation itself and think that the successful completion of intravenous infusion can be achieved by "hitting the nail on the head"; On the other hand, students communicate with SSP during operation, which improves their communication ability and clinical work awareness. In the process of practical operation, SSP and the operation team evaluate, propose and improve each other, so as to continuously improve the practice of intravenous infusion. They investigate the students who have entered the internship, and generally reflect that this teaching mode is close to the clinic. Most students can quickly adapt to the clinic and master the intravenous infusion technology, and consciously avoid or reduce

the risks and complications related to intravenous infusion. Especially in the case of the current global epidemic, the opportunity for students to enter the clinical internship is reduced, and this teaching method can make up for this deficiency.

## **5.2. Stimulating Students' Interest in Learning**

Medical knowledge often takes a lot of time to memorize, but in fact, clinical cases are not necessarily consistent with those described in textbooks. Using cases combined with SSP teaching allows students to participate in teaching [8,9]. Students who actively play SSP and partner groups with excellent performance are given extra points, which arouses students' enthusiasm for active learning, and the relevant medical theoretical knowledge is also involuntarily rooted in the operation, Students also pay more attention to the practical operation of intravenous infusion from their subjective consciousness, and have a good interest in this practical operation technology.

## **5.3. Improving the Practice Level of Intravenous Infusion**

In the practice assessment of intravenous infusion, most students have better scores than other practical operations, and are familiar with the infusion process and relevant knowledge points. Students are generally satisfied with this operation teaching method.

## **5.4. Enlivening Classroom Atmosphere and Cultivating Students' Team Spirit**

The students who play SSP and the intravenous infusion practice students are a team. The team members communicate and cooperate with each other in repeated practice, point out the existing problems, and constantly improve, so as to exercise and improve the team cooperation spirit [10,11]. In the practice of intravenous infusion operation, SSP will actively guide and cooperate with students, so that students can learn and adapt to getting along with "real patients" in advance, which reduces students' anxiety about clinical practice and enhances their confidence in serving patients well. SSP will also feel the role of patients in the process of playing [12].

## **6. Conclusion**

SSP is a practical teaching method in line with modern medical teaching. Its application in the practical teaching of intravenous infusion is conducive to the combination of medical theoretical knowledge and clinical practice, cultivate students' clinical thinking ability, and improve students' clinical operation skills and comprehensive quality. This teaching mode enlivens the teaching atmosphere. The close communication, interaction, feedback and guidance between teachers, SSP and students stimulate the enthusiasm of students to actively participate in learning. It not only facilitates the mastery of theoretical knowledge, but also truly transforms medical theoretical knowledge into personal clinical practice ability. Intravenous infusion operation is a common clinical operation. Using this teaching method can make students familiar with the key points and difficulties of this operation, After entering the clinic, the risk of intravenous infusion to patients can be reduced to a certain extent.

However, SSP also has some disadvantages. After all, SSP is not a real patient. Although the selected cases are typical, it can not fully reflect all the clinical symptoms of real patients, such as the evaluation of blood vessels, phlebitis and drug extravasation of shock patients and edema patients. SSP can not be shown, but can only be described. Moreover, although students master typical cases, they do not have enough understanding of the diversity of clinical diseases outside the cases. In addition, some students' attitude is not rigorous enough and laugh in the case combined with SSP teaching. Therefore, the significance of SSP application should be emphasized in the selection and training of SSP, so as to restore the real situation of clinical cases as far as possible. In the assessment, the teacher scores and evaluates according to the

cooperation between SSP and operating students, which may have subjective factors and may not be accurate and fair. Therefore, case combined with SSP teaching also needs continuous practice and exploration, improvement and perfection, and more application to other practical operations of nursing.

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