

# Application of simulation technology in pediatrics nursing teaching

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**Abstract** The present study explores the feasibility of utilizing simulation teaching in pediatrics nursing. The results further reinforce its positive impacts. It brings new opportunities for education but at the same time challenges for teachers. It in a long run will become an important direction of the nursing education reform. Striving for the best way to adopt it in nursing education is a crucial task. Nursing education in the mainland China will be further enhanced through trial and error.

## 1. Introduction

The use of simulation technology in teaching has been growing so rapidly that it becomes a trend in contemporary nursing education. It emphasizes the implementation of practical nursing skills with sound clinical reasoning through the utilization of patient simulator (Wan & Sun, 2006). It aims to bridge the gap between theory and clinical practice. A variety of simulation is used from basic skill practice to scenario based training in both undergraduate and postgraduate nursing education. It helps in diversify teaching and maximize the range of knowledge and skills (Tait & Sim, 2007).

## 2. Background of using simulation teaching in practical pediatrics nursing training

Merely theory is not sufficient enough to prepare students to be a competent nurse. The core component in nursing education is real patients. However, real patients decline to be the model for teaching (for example, being examined by teachers in front of nursing students or even by the students directly) especially for highly skillful or risky tasks (Shen, 2007). This catalyzes the adoption of simulation teaching. Simulation teaching provides a safe controlled learning environment where students can practice under direct supervision or independently some specific skills such as inspection, percussion, palpation, auscultation, intravenous therapy, catheterization, wound care, nasogastric intubation, aseptic dressing technique and intramuscular injections (Tait & Sim, 2007). In pediatrics nursing training, simulation teaching uses a child patient simulator which not only has an analog human body shape with vital signs but can also manifest

pathological signs (such as coughing, tachycardia and tachypnoea). It is supported by Tait and Sim (2007) that skills on assessment, diagnostic reasoning and clinical reasoning can be developed through simulation teaching. Clinical conditions set by the patient simulator program are used as the core element to nurture students' caring concepts and clinical skills. The learning process is student-centered whereas teachers only act as facilitators. Students act as nurses while teachers play the roles of family and doctor. It provides opportunities for students to polish their skills to communicate and collaborate with these significant others of patient. The whole process is video-taped and played back for discussion (Figure 1).

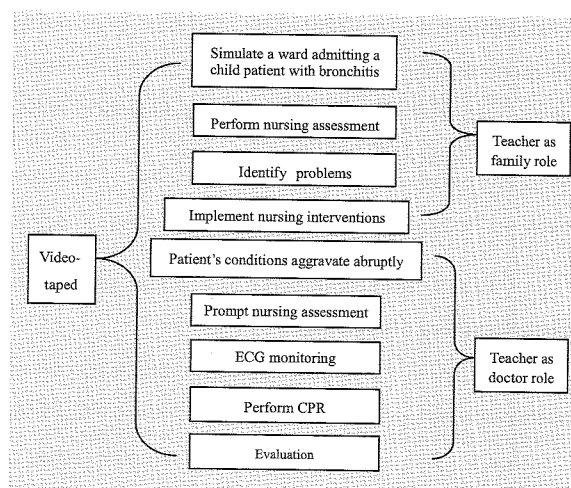


Figure 1 Simulation teaching design

## 3. Method

Seventy-six third year students (8 male and 68 female) of a four-year undergraduate nursing program in a nursing school were recruited. After participating in simulation training on pediatrics nursing, they were asked to administer an evaluation form on a five-

point Likert scale (“strongly agree”, “agree”, neutral”, “disagree” and “strongly disagree”) for both simulation teaching and traditional teaching. The evaluation form was developed by the experienced teachers there according to the five core intended learning outcomes, namely, learning motivation, classroom participation, knowledge, skills, and satisfaction. Each domain contains various sub-items (43 in total). The scores from “strongly agree” to “strongly disagree” are 4 to 0 respectively. The average of the scores of the sub-items constitutes the mean score of that domain.

#### 4. Results

The mean scores of the five domains are 3.15, 2.95, 3.03, 2.94 and 3.30 respectively for the simulation teaching and 2.19, 1.96, 2.03, 1.81 and 2.49 respectively for the traditional teaching. Four out of the 5 domains including learning motivation, classroom participation, knowledge and skills have the mean score significantly higher in simulation teaching ( $p < 0.05$ ). The highest mean score in simulation teaching falls on satisfaction domain although there is no significant difference when compared with traditional teaching.

#### 5. Discussion

Results show that the learning outcomes are better in simulation teaching than in traditional teaching. There are several possible explanations for accounting the student- perceived benefits of simulation teaching. Students usually have difficulties in understanding the caring concept and skills through theoretical teaching. However, by participating in simulation teaching under teachers' guidance, they can easily master such knowledge and concept and then incorporate it into clinical reasoning process. The child patient simulator enables the students to perform the nursing assessment and obtain the findings in highly analog patient conditions and ward environment. Nursing interventions are formulated according to the assessment findings. While case design is a challenging task, a good case definitely facilitates learning. The child patient simulator being able to emit different crying sounds enables

the students to sharpen their abilities to differentiate various types of crying and hence formulate appropriate management.

As from nurse educators' points of view, simulation teaching is also beneficial. Nursing education is not to “produce” qualified personnel to meet the demand of manpower but nurture the students' clinical skills, problem-solving skills as well as reasoning power (Wang & Wang, 2007). Clinical teaching plays a crucial role in fulfilling this mission. While insufficient resources have already induced barriers for implementing clinical teaching, the advantages of using simulation teaching make it a solution. Nevertheless, patient simulator should be chosen appropriately. As the goal of simulation teaching is to train students' clinical skills and reasoning abilities but not operational procedures, the patient simulator should be carefully selected or students would be just like a technician for operation. The following points should be taken into consideration: a) its proportion in the curriculum should not be in excess or it may overwhelm other teaching activities; b) avoid using those with long operational time and c) choose those analog to common clinical conditions but rarely be allowed to handle in real ward situations. Furthermore, assessment is essential and should be specific enough according to the expected outcomes of simulation teaching approach. It can be done, for example, by giving a verbal/written report on the case management.

The results of this study further reinforce the positive impacts of simulation teaching on nursing education. It is in line with the literature that preparation of nursing students for the future professional roles is supported and enhanced by simulation teaching (Tait & Sim, 2007). Although simulation teaching is advantageous, it cannot totally replace the traditional classroom teaching and clinical practicum (Liu, 2006). Nevertheless, simulation teaching will in a long run become a very important direction of the nursing education reform (Li, 2004).

#### 6. Conclusion

It not only brings new opportunities for education but also challenges for teachers. Striving

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### 情景學習在愛丁堡護理本科教育中的應用

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**摘要** 目的：瞭解情境教學法在愛丁堡護理本科教育中的適用性。方法：評估情境教學法在一年級護理本科生教育中的實際價值。教師與學生同時使用量表來評價教學方案。在整個學年過程中評價是持續進行的。結果：教師與學生對情境教學法的價值達成初步共識，認為其對新入校護生的學習有積極作用。評估結果顯示在課程當中一些特定情景的時間需要進行一些細微的調整。結論：情境教學法是有利於師生雙方的有效教學工具。

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for the best way of its utilization in nursing education will become one of the crucial missions of nurse educators. Evaluation should be more systematic so as to reflect more precisely the effectiveness of simulation teaching. It can be done by validating the items of learning outcomes in the student feedback questionnaire and by obtaining students' qualitative comments through the use of focus group. It is believed that through trial and error, the nursing education in the mainland China will be further enhanced.

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### 模擬技術在兒科護理教學中的應用

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**摘要** 本文探索兒科護理教育中模擬技術應用的可行性。文章進一步說明瞭該技術的正面作用，模擬技術對護理教育帶來新的機遇的同時，也對護理教師提出了一些挑戰。從長遠來看，模擬技術必將成為護理教育改革的重要方向。如何在護理教育中充分利用模擬技術是一個重要的任務，有待於中國的護理教育者們不斷探索與實踐。