

## RESEARCH ARTICLE

## Vaccination learning experiences of nursing students: a grounded theory study

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### Abstract

**Purpose:** This study aimed to explore the experiences of nursing students being trained to perform vaccinations. **Methods:** The grounded theory method was applied to gather information through semi-structured interviews. The participants included 14 undergraduate nursing students in their fifth and eighth semesters of study in a nursing school in Iran. The information was analyzed according to Strauss and Corbin's method of grounded theory. **Results:** A core category of experiential learning was identified, and the following eight subcategories were extracted: students' enthusiasm, vaccination sensitivity, stress, proper educational environment, absence of prerequisites, students' responsibility for learning, providing services, and learning outcomes. **Conclusion:** The vaccination training of nursing students was found to be in an acceptable state. However, some barriers to effective learning were identified. As such, the results of this study may provide empirical support for attempts to reform vaccination education by removing these barriers.

**Key Words:** *Grounded theory; Iran; Problem-based learning; Nursing students; Vaccination*

### INTRODUCTION

Vaccination is one of the most important elements of global health, and annually prevents morbidity and mortality in more than two million children under five years of age. Vaccination programs require special training techniques [1]. All of the fundamental aspects of vaccination training must be included in sessions that provide students with the opportunity to administer vaccinations under the supervision of educators [2]. Since practical training is an essential component of implementing expanded immunization programs, training courses should provide valuable opportunities for students to gain ex-

perience in their future profession. Some issues have been identified in vaccination training programs for nursing or health profession students, such as the inadequate training of the students [3], poor communication skills with clients [4], and insufficient practical skills [5]. In addition, students may learn incorrect techniques from the staff that can endanger the clients' health, including incorrect injection techniques, improper storage, using expired vaccines, inadequate client training, and poorly managing vaccination complications. Therefore, students need to obtain sufficient information about vaccination to manage and prevent related risks and complications. Although proper teaching is one of the best ways to prevent such problems, studying the experiences of nursing students could both provide sufficient information about deficiencies in vaccination training and serve as a prerequisite for reforming vaccination training by identifying effective elements of the education process. This study aimed to explore the experi-

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ences of nursing students in vaccination training, with the goal of obtaining in-depth information addressing these challenges.

## METHODS

Qualitative research based on grounded theory was applied to acquire in-depth information about vaccination training among nursing students. Grounded theory is appropriate for studying social processes in human interactions. It was first proposed by Glazer and Strauss in 1960, and is rooted in symbolic interaction theory [6]. Since the basic component of education is the exchange and interaction of experiences between educators and recipients, grounded theory seemed to be an appropriate method for this study.

The study participants were 14 undergraduate nursing students in the fifth and eighth semesters of study at the School of Nursing and Midwifery of the Mashhad University of Medical Sciences. They were between 20 and 25 years of age (mean age, 21.85 years). Seven students were in the fifth semester and seven others were in the eighth semester of the nursing program. Equal numbers of male and female students participated in this study. Three participants were married and the rest were single.

In the baccalaureate nursing curriculum in Iran, students learn the theoretical basis of vaccination in a two- to four-hour course session known as the 'Community Health Nursing Course No. 1.' They also learn practical issues in training courses in urban and rural health centers. The 'Community Health Nursing Training' course is scheduled for 10 days in the fifth semester. Students stay in urban health centers from 8 AM to 1 PM. They were divided into groups of two to four and rotate through different units, including vaccination, mother-child health, environmental health, disease control, dentistry, and pharmacy. In the vaccination unit, all routine vaccines, including measles-mumps-rubella vaccine (MMR), diphtheria-tetanus-pertussis vaccine (DPT), booster vaccine for tetanus and diphtheria (Td), diphtheria-tetanus vaccine (DT), BCG vaccine, oral polio vaccine (OPV), and hepatitis B vaccine, are given to the target groups. The 'Community Health Nursing Training' field course is scheduled for five weeks in the eighth semester. Students attend urban health centers from 8 AM to 1 PM for three weeks and visit factories and villages for the remaining two weeks.

The Ethical Committee of the Mashhad University of Medical Sciences (Ref. 89429) approved this study. Before the interview, the participants were given oral and written information about the objectives of the study, the maintenance of anonymity, the confidentiality of their information, and their right to withdraw from the study. Written consent was obtained from

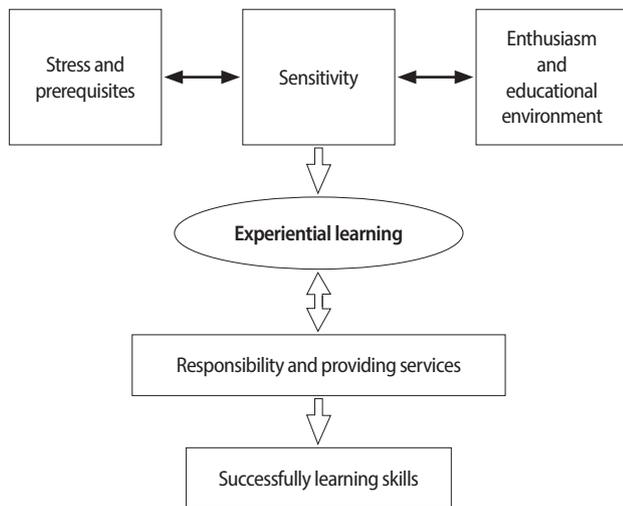
all participants.

Participants with the necessary experience were selected from Mashhad's nursing education community health centers. The selected students were interviewed using purposive and theoretical sampling from 2010 to 2011. All interviews were scheduled for between 60 to 90 minutes in a classroom in the School of Nursing and Midwifery. The interviews were recorded with a digital audio recorder and were later transcribed. The participants were encouraged to express their experiences and feelings about community health nursing training freely. In order to explore in-depth information, the researchers used probing questions such as "Might you explain more about this?" or "What do you mean when you say...?" After analyzing the information obtained through purposive sampling, theoretical sampling was used to acquire further data. The theoretical sampling process consists of collecting data with the goal of creating a theory; the analyst collects and analyzes data and then decides what must be collected in the next step in order to reach the theoretical goals that had been identified [6]. Sampling was continued until data saturation. Data collection and analysis were performed simultaneously.

The data were analyzed using constant comparative analysis as well as open, axial, and selective coding methods as defined by Strauss and Corbin [6]. The open codes of each interview were compared within that interview and with the open codes of other interviews in order to identify similarities and differences. Similar codes were placed in a single category. For axial coding, a paradigm was used that focuses on causal conditions, intervening conditions, and action/interaction strategies and outcomes, which provide the basis for links among the categories. A coding paradigm can only identify the associations between phenomena and concepts, and concepts and categories were used in order to discover or establish the communication structures among phenomena [2]. In the selective coding phase, experiential learning was extracted as the main category. The information was analyzed using MAXqda 2 (VERBI GmbH, Berlin, Germany). The rigor and trustworthiness of the information were increased through prolonged engagement, peer debriefing, member checking, triangulation, and the complete description of the procedures.

## RESULTS

The information revealed that 'experiential learning' was a core category, along with eight subcategories, including 'students' enthusiasm, vaccination sensitivity, stress, proper educational environment, absence of prerequisites, students' responsibility for learning, providing services, and learning outcomes.' Experiential learning was a core category of the current study, emphasizing learning in a real-world environment. The stu-



**Fig. 1.** The vaccination learning process.

dents actively engaged in the learning process and understood both factors that facilitated their learning and factors that served as barriers. They demonstrated their enthusiasm for learning the relevant skills through involvement in the tasks, communicating with the clients, competition with their peers, studying the educational materials before attending the vaccination unit, and attempting to perform the tasks independently. In addition, the students reflected on vaccinations prior to providing them in order to satisfy the parents of children who were worried about the complications of vaccinations. When the parents were especially concerned about potential complications, the staff or teacher supported the students by offering information to the parents and assuring them about the safety of the procedures. However, a lack of information and stress were barriers to learning vaccination skills.

The core category, together with the subcategories, comprised the vaccination education process (Fig. 1). Experiential learning refers to the knowledge, skills, and attitudes that lead to professional competency in vaccination.

### Vaccination sensitivity as a causal condition

The vaccination sensitivity subcategory was a causal condition of the experiential learning phenomenon. Sensitivity may refer to susceptibility to vaccination side effects including previously unknown complications as well as parents' psychological reactions to the vaccination of their children. Therefore, vaccination requires control, supervision, and precision. In this regard, three of the nursing students stated: "Our teacher was present at all vaccinations in order to prevent the occurrence of any possible complications" (student 12); "The teacher usually waited longer when supervising a vaccination because of his or her heavy responsibilities if any complications

occurred" (student 4); "How sensitive the mothers are toward their children!" (student 3).

### Enthusiasm and educational environment as facilitators

The enthusiasm of the students and an appropriate educational environment facilitated professional performance. The subcategory of enthusiasm refers to students' perceptions about the concepts covered in training and the limitations of the vaccination unit. The students considered the vaccination unit to be a good unit for learning and believed that similar training programs should be implemented in other units. The following statements reflect their perceptions: "The first day we went, we knew that the vaccination unit was a good unit for learning" (student 3); "The only thing we knew was that we should just perform vaccinations" (student 4); "Well, health care is delivered only in vaccination unit; another part is the midwifery program that they don't send us to. That is what we knew then; there remains family health, which again they don't send us to. Then there remains only the disease control unit" (student 3). The vaccination unit was a suitable environment for education, both because it contained many clients and because the staff members were cooperative and gave the students opportunities to be independent as well. The students also expressed their views on this, as follows: "Well, especially when we were in the vaccination room the number of clients was really high. There were a lot of clients" (student 8); "We did too much work in the vaccination unit" (student 11); "He (vaccinator) let the students handle the job themselves; he didn't interfere too much" (student 1).

### Stress and absence of prerequisites as barriers

Stress and the absence of prerequisites were barriers to experiential learning. The absence of prerequisites presented as deficits in students' theoretical and practical preparation at the beginning of training. Two of the nursing students said: "The first day, I didn't know anything about vaccination; whether it should be muscular or subcutaneous, whether babies should be injected or not, and whether the age of the baby makes any difference. I didn't know any of that" (student 10); "I didn't know anything about what to inject in a two-month-old child or what vaccines should be given to clients" (student 8).

The students felt stress in the first few days of training, especially when they vaccinated infants. This reflected the students' fear of vaccinating infants and children. The following comments indicate that the students experienced stressful conditions: "I'm very afraid of vaccinating a baby and I didn't do it on the first day" (student 11); "I always experience stress when vaccinating small children" (student 6); "During the first days, we were a little afraid of vaccinating babies, because they were so young and small" (student 10).

### Responsibility for learning and providing services as achievement strategies

The participants used two strategies to take responsibility for learning and providing services and to achieve professional levels of performance. Attempts to learn vaccination and competition in vaccinating were considered to be part of the learning process: “The day before vaccination, I prepared myself theoretically by studying the vaccination textbook in depth” (student 14); “During those 10 days, we were very eager to do injections. We were also competing with each other to be the first one who would perform vaccination” (student 12); “I practiced the theoretical subjects that our teacher taught for the next day; I tried to learn the types of vaccines for different age groups” (student 11). Providing services to the clients was another strategy for learning. The students attempted to offer the best possible services to the clients by performing requirements such as preparing vaccines and injections: “Both the teacher and the students cooperated in preparing the solution and vaccines and other things needed for the vaccination; we put them in a box to be available” (student 5); “One person (student) sat behind his or her desk and completed the paperwork, such as the name and the number of the case file. Another (student) prepared the vaccines and performed the injection” (student 9). The students injected vaccines in all groups of clients, including pregnant women and children. They also presented the clients with the necessary education: “We vaccinated all mothers who were pregnant” (student 11); “In the vaccination room, we explained to mothers what the effects of the vaccine were and so on” (student 2).

### Successfully learning skills as the final outcome

Experiential learning as applied to vaccination training focused on the theoretical and practical issues of vaccination. The participants commented on their learning outcomes as follows: “The last time that we performed a vaccine, we did not look at the chart. We knew what was suitable for two-, four-, and six-month-old infants” (student 8); “It was not hard at all for me. I had no stress in the vaccination section. We worked well in that section” (student 6).

Although most of the students stated that they successfully learned how to perform vaccinations, two of them described insufficient learning: “Though we were in the vaccination unit, when we were in the fifth semester and spent almost three weeks in the same unit in the current semester, we still didn't learn vaccination well” (student 7); “We didn't learn a lot of things” (student 13).

## DISCUSSION

This study described the experiences of nursing students in

vaccination training and found that experiential learning was the basic process in the vaccination training process. Vaccination sensitivity was the most prominent factor that affected the participants' performance. The nursing students applied two strategies to learn vaccination, including taking active responsibility and providing services to clients. Vaccinations performed by inexperienced staff or students increases the complication rate of vaccinations, and parents were therefore very sensitive about allowing students to vaccinate the children. Nursing students were motivated by the parents' expectations for error-free procedures and established good communication with them; increasing the trust of the parents and providing them with the necessary training were the most important factors in the success of the immunization program.

Stress and the absence of prerequisites were barriers to professional performance. In a study carried out by Nikula et al. [7], fear of injecting clients, inexperience, concerns, and parents' insufficient knowledge regarding vaccination were found to be the attenuation factors for vaccination competency. Barriers can reduce students' confidence and limit their learning opportunities, leading to health risks such as vaccination complications.

Our results showed that students had positive attitudes toward vaccination training. They knew the benefits of vaccination before starting the course. This meant that students felt a great deal of responsibility for achieving the theoretical and practical learning objectives. Nikula et al. [7] found that positive attitudes and an interest in vaccination were important factors in vaccination training. The current study also emphasizes that a proper environment is one of the most important factors influencing students' performance. The cooperation of the staff in giving students a responsible role in vaccination and the extremely large number of clients were considered to be very important factors contributing to learning and professionalism in vaccination training. Nikula's results further showed that a pleasant, supportive, and positive social environment reinforced competence in vaccination training [7].

The majority of students achieved theoretical and practical knowledge of immunization services by the end of the course. In another study by Nikula et al. [1], the students' self-evaluation reflected a high level of perceived competence. However, some inconsistent results have been reported in other studies. Pelly et al. [3], for example, reported that only 21% of the students believed that they received enough vaccination training, and Vorsters et al. [4] argued that the participants in their study had not received the required level of vaccination training. Differences between the current study and previous studies may be due to the students' positive attitudes towards vaccination training in the present study.

In conclusion, the findings of this study indicated that the

vaccination training of nursing students is in an acceptable state. Nevertheless, the current situation could be further improved by removing the barriers to learning. Therefore, nursing graduates would have the necessary competence for vaccination services. This study provides empirical support for nurse educators and the staff of vaccination units who may want to reform vaccination training, and the concepts that emerged from this study may prove valuable for future research.

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### CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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### SUPPLEMENTARY MATERIAL

Audio recording of abstract.

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