

Educational Needs of Nursing Student in the Development of a Virtual Reality-Based Program for Medication Education

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Abstract

The purpose of this study is to verify the experience and training needs of virtual reality (VR)-based programs for nursing students and to obtain preliminary information to develop a practical training program for medication based on VR. Data collection was conducted for 168 nursing students from June to September, 2017. As a result, 7.7% experienced VR education programs and 76.6% answered that they did not have any opportunity. 58.0% reported that they should solve the problem related to wearing the VR device and the health problems such as dizziness (30.0%). The virtual reality program is better to be applied to the fundamental nursing practice (34.0%). there was a high demand for voluntary practice for medication nursing. It is necessary to have a program that can confirm their own abilities before the fundamental nursing practice test (15.6%) and to solve the question of whether they are practicing correctly (38.5%). The results of this study can be used to provide a basis by developing a self-directed practice program for VR-based medication reflecting the needs of learners and suggest a new direction of nursing education by combining the integrated research with advanced science.

Keywords: Needs assessment, Virtual reality, Fundamental nursing, Medication, Self-directed practice

1. Introduction

Fundamental nursing is a course composed of theory and practice. This course is designed to teach basic nursing meaning and concept to nursing students and to apply them to clinical practice. Nursing students are trained to develop core and fundamental nursing skills necessary for solving the health problems of the subjects in the medical field through the fundamental nursing practice and as a nurse [1]. The fundamental nursing practice ability considers correct attitude and habit formation¹ as an important result of learning so that students can master nursing skills automatically without conscious effort through problem solving through trial and error and repeated training of the technique [2][4]. In the fundamental nursing practice, the instructor has been trained to observe the learner's behavior on a one-to-one basis. It has consisted of a passive form of practice that involves modeling in the practice room or repeating fragmentary nursing skills [5]. In addition, there is a problem that the opportunity of practicing nursing skills given to nursing students is limited due to lack of practical training sites, limited access to the subjects, lack of teaching staff, and lack of practical credits and time. In addition, as the knowledge level of the medical information of

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the patients and the caregivers of the hospital is raised, the demand for high quality nursing service is increased. Therefore, if the nurse does not cultivate accurate fundamental nursing skills, it also affects clinical maladjustment.

The autonomous practice, which is suggested as a new practice education method, is a way to learn while learning the knowledge or function required by the student himself or herself without being overly interfered with by the professor. In Korea's nursing practice education, It is suggested as a realistic way to complement the lack of facilities and training expenses. However, in the case of self-directed training, research and interest are continuing on how to increase student's interest and learning satisfaction with important education.

Virtual reality (VR) enables many people to experience the same situation and images at the same time, and it enhances the educational effect with realistic images, which is expected to be used in various fields ranging from industrial fields, everyday life, medical training, to be [6]. VR provides a realistic training experience, permits sufficient iterative learning without being restricted by the number of times and learning times, and encourages autonomous learning participation by increasing the learner's self-confidence through homogeneous mock reality. In addition, it can be predicted the effects of positive feedback, communication skill, satisfaction and achievement as active participants, problem solving ability, practical ability, communication skill and knowledge improvement.

Therefore, if a program based on VR is applied as a fundamental nursing self-practicing method, students will analyze and evaluate their own nursing practice behavior and find out what the problem is and will be able to practice it repeatedly to improve it.

2. Methods

2.1. Study design

This study is a descriptive research study to understand the experiences and education needs of nursing students about VR-based programs and nursing practice of medication.

2.2. Samples and data collection

The purpose of this study was to investigate students' need for developing a VR based medication nursing practice program and to study nursing students in a nursing course in P city. Of the 170 participants who understood the purpose of the study and voluntarily participated in the study, 168 participants were included in the analysis.

The researcher should explain the purpose and method of the study, the anonymity of the research participation, voluntary consent and rejection of the research, possible abandonment, possible benefits and disadvantages, verbally and in writing, the questionnaire was distributed and retrieved (IRB 201704-HR-002). The total time spent in the questionnaire was about 10 minutes.

2.3. Instruments and data analysis

In this study, we investigated the educational needs of nursing students using questionnaires developed by researchers through previous research, literature reviews and researcher's experiences. The preliminarily structured questionnaire was revised and supplemented by verifying the content validity of two nursing professors. The final developed questionnaire consisted of 41 items, which consisted of 8 general characteristics, 19 virtual reality related characteristics, and 14 characteristics related to fundamental nursing self-study.

The collected data were analyzed using SPSS / WIN 23.0 statistical program and analyzed by real, percentage, mean and standard deviation.

3. Results

3.1. General and educational characteristics

The subjects consisted of second grade students (51.2%) who were taught fundamental nursing practice and 168 students (48.8%) who had practiced fundamental nursing practice and experienced clinical practice. The average duration of use of smartphone was 6.07 hours in one week and 48.8% of the subjects experienced web-based education. Most of the web-based education experienced by the subject was virtual classroom (distance education), and 10 students (9.2%) had experience using video English education program. Among the virtual reality programs that the subject experienced, there were experiential programs (7 people) including play equipment and video programs (2 people) besides games, and one student answered that they experienced a simulator game for military medical educators.

76.6% of the respondents said that they did not have the opportunity to experience the obstacles in using the VR program, and 13.0% answered that the expensive price was burdensome (Table 1).48 students responded to the problem when they experienced the virtual reality program. 58.0% of them answered that they had problems wearing glasses (glasses), and 30.0% answered that they were health problems.

Table 1. Barriers to using virtual reality programs

Variables	Frequency (%)
Lack of opportunities to experience	59 (76.6)
Expensive price	10 (13.0)
Indifference	4 (5.2)
Fear of negative aspects	2 (2.6)
Insufficient time	2 (2.6)

Duplicate response

3.2. Fundamental characteristics of nursing training

In terms of fundamental nursing self-directed training, students recognized the importance of self-directed practice as an average of 8.9 out of 10, and the average self-practicing time per student was 3.29 hours per week. 53.1% of students who had experience in medication nursing practice practiced an average of 3.03 hours per student per week. Most respondents answered that they had practiced correctly in the fundamental nursing practice (38.5%). There were also 13.5% problems in using labs, 12.2% in proficiency problems, and 10.1% in other interpretations of students' protocols.

3.2. Virtual reality program and core fundamental nursing skills

When asked about the subjects' demands for virtual reality education program, 34.0% required fundamental nursing practice and 33.0% required all nursing practice (Table 2). Regarding the fundamental nursing practice, the demand for medication nursing was the highest at 25.0%, and the subject's request for the ability to confirm their ability before the fundamental nursing practice test was 15.6%.

Table 2. Needs of virtual reality-based education program

Variables	Frequency (%)
Fundamental Nursing Practice	32 (34.0)
All nursing practice	31 (33.0)
Simulation-based Practice	10 (10.6)
Practice for client	7 (7.4)
Emergency Nursing	6 (6.4)
Hospital experience	4 (4.3)
Health Assessment for Nursing Practice	4 (4.3)

Duplicate response

4. Discussion and conclusion

The purpose of this study was to investigate the experiences and educational needs of the participants in VR-based programs and medication nursing practice training for the development of VR-based medication nursing practice program for nursing students.

In this study, 76.6% of respondents answered that they do not have the opportunity to experience virtual reality program using obstacle factor. In addition, 13.0% of the students felt the burden of installing expensive equipment as an obstacle to using the virtual reality program, and it is estimated that it is difficult to popularize it because of the expensive equipment [7]. In order to increase the accessibility of virtual reality in society as a whole as well as nursing, obstacles to be considered in the development of virtual reality program applied to nursing and device selection, And it is predicted by academia that anyone can easily experience immersive virtual reality technology.

58.0% of the problems related to wearing glasses (glasses) were the most frequently mentioned problems in the experience of virtual reality program. It seems necessary to consider. (30.0%), such as dizziness, which is often referred to as cyber-nausea (30.0%), and the visual safety problem of the user such as dizziness when using this VR program is caused by the cause related to the sensory cause and posture, It is pointed out as a major obstacle to market development [8]. Among the core fundamental nursing practice items, the demand for medication nursing was the highest (25.0%), and the subject's requirement (15.6%) was also high for the program that can confirm their ability before the fundamental nursing practice test. VR provides a world of participatory learning, an interactive experience, which is

advocated by many pedagogues, including constitutionists [7]. In addition, it has the advantage of providing possibility to experience individual level learning, express various contents, flexibility of coping with time and space constraints, provide concrete experience, and provide opportunity to experience real but difficult experience. The advantages of the virtual reality program are likely to reflect the needs of students identified in this study.

The purpose of this study is to identify the experiences and educational needs of learners about virtual reality program and medication nursing practice program for nursing students as a basic study for introducing virtual reality technology into fundamental nursing practice education. It is necessary to construct the content of the medication nursing self-practicing program reflecting the experience of the learners and the educational needs identified from the results of this study. It is expected that the program to be developed by reflecting the needs of the learner will help not only the academic achievement which improves the skill of the learner but also the improvement and stabilization of the educational environment.

In the future research, it is necessary to analyze both the in-depth analysis of the needs of the learner and the demands of the instructor at the same time as a strategy for increasing the educational utilization of the VR-based medication nursing practice program and to find a way to overcome the technical limit, It is necessary to develop a detailed plan for detailed scenario development and program activation.

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References

- [1] M. R. Nam, "Effectiveness of web-based learning in basic nursing practice education: Focusing on asepsis technique practice". *Journal of Korean Academy of Fundamentals of Nursing*. Vol. 12, No. 3, (2005)
- [2] G. E. Joo, K. Y. Sohng, and H. J. Kim, "Effects of a standardized patient simulation program for nursing students on nursing competence, communication skill, self-efficacy and critical thinking ability for blood transfusion". *Journal of Korean Academy of Fundamentals of Nursing*. Vol. 22, No. 1, (2015)
- [3] K. Kim, S. O. Chang, H. Kang, K. S. Kim, J. I. Kim, H. kim, J. Park, M. R. Eom, M. Yoon, O. Lee, and J. S. Won, "Content and educational needs for fundamental nursing practice". *Journal of Korean Academy of Fundamentals of Nursing*. Vol. 18, No. 4, (2011)
- [4] J. K. Ko, M. S. Chung, M. A. Choe, Y. I. Park, K. S. Bang, J. A. Kim, M. S. Yoo, and H. Y. Jang, "Modeling of nursing competencies for competency-based curriculum development". *Journal of Korean Academic Society of Nursing Education*. Vol. 19, No. 1, (2013)
- [5] J. Won, H. Park, Y. Shin, H. Park, S. H. Lim, M. Shin, J. Kim, Y. Kim, S. O. Chang, S. K. Chaung, and Y. Yang, "Learning outcomes and teaching methods in fundamentals of nursing". *Journal of Korean Academy of Fundamentals of Nursing*. Vol. 23, No. 3, (2016)
- [6] E. B. Bauman, "Game-Based Teaching and Simulation in Nursing and Health Care", Springer Publishing Company, New York (2013)
- [7] K. H. La, "A study on instructional design strategies for improving virtual reality contents interface", Unpublished master's thesis, Hanyang University, Seoul, Korea (2017)
- [8] J. W. Oak, A study on prevention and management of dizziness in 3D 360 degree VR images, TongMyong University, Busan, Korea (2016)

