

## Effect of 360-degree Hospitalization Guide Video Content for ICU Caregivers on Anxiety, Satisfaction and Safety Perception

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### Abstract

The purpose of this study was to provide a 360-degree video on intensive care unit admission guidance to family members admitted to the intensive care unit, and then to identify anxiety, safety perception, and satisfaction. This study was a single-group pre-post design, and the data collection period was from October 1, 2020 to August 30, 2021. The subjects of this study were 19 people who applied 360 degree hospitalization guide video. For data analysis, SPSS WIN 24.0 program was used, and real number, percentage, mean, standard deviation, minimum value, maximum value, and Wilcoxon signed rank test were used. The subjects' anxiety before intervention was an average score of  $6.21 \pm 2.30$  and the anxiety after intervention was an average score of  $3.95 \pm 2.46$ , which was statistically significant ( $z=4.13$ ,  $p<.001$ ). The safety consciousness of the subjects before the intervention was an average of  $4.08 \pm 0.39$  and the safety consciousness after the intervention was an average of  $4.54 \pm 0.48$ , which was statistically significant ( $z=5.00$ ,  $p=.001$ ). The highest level of satisfaction with the 360-degree hospitalization guidance image of the subjects was  $4.58 \pm 0.51$  and the lowest was  $4.16 \pm 0.96$ . In this study, when 360-degree hospitalization guide video was applied, there was a difference in anxiety and safety perception, and satisfaction was high. Based on the research results, various programs for guardian education can be developed and utilized in the future.

**Keywords:** Anxiety, Caregivers, Perception, Safety, Satisfaction

## 1. INTRODUCTION

The intensive care unit can become a more threatening environment for families than the general ward due to various and complex high-tech monitoring devices, life extension equipment, uncomfortable appearance of a patient lying down with an insertion tube and drainage tube, and the urgency of the changing condition[1]. Concerns about the patient's prognosis, the unfamiliar environment of the intensive care unit, the burden from the treatment or examination process, and the attitude of health care personnel are added to the tension of the

health care staff, adding to the fear of the unknown situation, increasing the anxiety of the intensive care patient's family [2]. The psychological support of the family experienced in the early stage of admission to the intensive care unit is the absolute weakest in the relationship with the medical professional, and therefore, not only the emotional support of the family but also the informational support is very important [3]. In previous studies, family state anxiety was higher than that of adults or patients, and anxiety increased when family needs were not met, so it was emphasized to recognize and satisfy family needs [2]. It is necessary to develop a family-oriented customized communication method that goes beyond providing general information so that the nurse can properly understand the current situation by collecting and selecting information generated from the intensive care unit environment in advance, rather than simply providing information to families [3]. It is possible to build trust with medical personnel through communication, to form a cooperative relationship among patients, families, and nurses based on trust, to reduce stress in the intensive care unit family and to improve coping[4], thereby alleviating anxiety. will be. It is important to provide information about the hospital orientation including patient visits, intensive care unit patient management, major equipment, and visit times as information for the families of critically ill patients [5]. Patient management in the intensive care unit and provision of information about intensive care unit equipment and medical personnel in charge of the intensive care unit family [6] can help reduce anxiety and improve satisfaction with information provision. On the other hand, safety awareness not only has knowledge related to safety facts, concepts, methods, causes, etc., but also has a perception of a dangerous situation. means [7]. Therefore, the level of safety awareness can be a factor that directly or indirectly positively affects the ultimate safety behavior [8]. Interventions that increase access to various patient-related information are needed [9]. Traditional methods of nursing education such as oral explanations differ in the quality of education depending on the nurse's individual ability [10]. In addition, compared to leaflets and booklets, which convey information by limiting the visual aspects of text and images, moving images can deliver more information through moving images by mobilizing sight and hearing. It is a situation that occupies an important role [11]. With the recent development of ICT technology, immersive content such as 360-degree video has been developed, showing positive effects. Therefore, this study was attempted to confirm the anxiety, satisfaction, and safety perception of caregivers by providing 360-degree video contents with information about admission guidance to the intensive care unit to the families of patients admitted to the intensive care unit.

## **2. EXPERIMENTS**

### **2.1. Study Design**

The purpose of this study was to provide a 360-degree video on intensive care unit admission guidance to critically caregivers admitted to the intensive care unit, and then a single group pre-post design to identify anxiety, safety perception, and satisfaction.

### **2.2. Participants**

The criteria for selection of subjects for this study are the guardians of patients who are admitted to the intensive care unit, who receive guidance on inpatient life for the first time, and those who understand the purpose and purpose of this study and voluntarily agree to participate in the study. Subject exclusion criteria were subjects who indicated discontinuation of participation in the study, subjects who experienced cybersickness when experiencing 360-degree images, and subjects aged 60 years or older. At the time of research approval from the Research Ethics Committee in this study, there were a total of 80 subjects (40

people who applied the general guideline and 40 people who applied the 360-degree hospitalization guide video), but due to the sudden change of Covid 19 pandemic situation, critical patients at participating hospitals visits were prohibited, so the final participants were those who applied the 360-degree hospitalization guide video, and there were no dropouts. After the nursing manager explained the research to the study subjects, the subjects who voluntarily consented to participate were instructed to fill out the research participation consent form and the preliminary questionnaire. Subjects watched a 360-degree virtual reality video under the supervision of a nursing manager, and then filled out a post-mortem questionnaire. A set of hygiene products was provided as a case study for participation in the study.

### **2.3. Instruments**

#### **Anxiety**

The Numeric Rating Scale (NRS) was used to measure anxiety. 10 cm means very anxious, 0 means not anxious at all, the higher the number, the higher the anxiety.

#### **Safety Perception**

Based on the educational content that guides ICU caregivers, we drafted 9 questions by reviewing the literature and collecting the opinions of ICU managers and nurses. allowed to evaluate. This was based on a study that suggested that the number of experts to verify content validity should be between 2 and 20. For each question, 'very appropriate' 4 points, 'relatively appropriate' 3 points, 'relatively not appropriate' 2 points, 'not appropriate at all' 1 point, 'not appropriate' and 'not at all appropriate' In the case of 'do not do', it is possible to write an opinion about it. The results were calculated as Content Validity Index (CVI), and items above 0.8 were selected as significant items. As a result of the content validity test, all 9 items had a CVI of 0.8 or higher. The developed items are composed of a 5-point rating scale, with 1 point for 'not at all', 2 points for 'disagree', 3 points for 'average', 4 points for 'agree', and 5 points for 'strongly agree'. This indicates a high awareness of safety awareness.

#### **Satisfaction**

Satisfaction with 360-degree video was measured by modifying the satisfaction evaluation tool for video developed [12,13] to 360-degree video content. It consists of a total of 9 items: difficulty of content, appropriateness of language, interest, motivation, effectiveness, appropriateness of time, appropriateness of screen composition, sound quality, and screen quality. Each item is scored on a Likert 5-point scale from 1 point of 'very inappropriate' to 5 points of 'very appropriate', with higher scores indicating higher satisfaction with 360-degree video content.

### **2.4 Data Collection**

Before conducting the research and filling out the questionnaire for data collection, the purpose and purpose of the study were explained to all subjects, and then informed consent was obtained. The consent form for participation in this study was composed of the contents that participation in this study is voluntary, that the questionnaire will be used only for research purposes, and that the anonymity of the research participants is guaranteed. After providing the research subjects with information that they can stop participating in the research at any time without forcing them to participate in the research and answer the questionnaire, they

were instructed to sign the consent form and fill out the questionnaire.

In addition, the researcher's name, e-mail address, and phone number were provided so that inquiries can be made at any time during the study participation. After filling out the preliminary questionnaire, a 360-degree hospitalization guide video was watched [figure 1-3], and after the visit to the intensive care unit was completed, the questionnaire was filled out.

Figure 1 shows 360-degree video screen about guide to hand washing. The nurse explains to the caregivers who visit the patient in the intensive care unit about precautions and preparations in the intensive care unit. Guardians must wash their hands thoroughly before and after visits to prevent infection in the intensive care unit. After washing your hands, record the name of the visitor and other information on the access approval list.



**Figure 1. 360-degree video screen about guide to hand washing**

Figure 2 shows 360-degree video screens about precautions. In the intensive care unit, nurses are intensively monitoring the overall condition and changes in consciousness, such as blood pressure, pulse, body temperature, respiration, and urine volume, 24 hours a day. Nurse explains medical device contact precautions. There are many medical devices attached to the patient, so be careful not to touch them as they may cause malfunctions or an alarm sound if touched or touched.



**(a) Description of patient monitoring**



**(b) Description of medical device contactism**

**Figure 2. 360-degree video screens about precautions**

Figure 3 shows 360-degree video screens about nursing activities. Nurses perform thrombus prevention nursing for ventilator patients. A patient on a ventilator automatically alternates leg compressions to prevent blood clots. Nurses provide sanitary care. The patient's face and body are wiped every morning, and the hair is washed once every three days. Nurses provide oral care with mouth sanitizer 3 times a day. The patient's urine and feces are accurately checked by the nurse and the diaper is changed.



(a) Thrombosis prevention nursing



(b) Description of hygiene nursing

**Figure 3. 360-degree video screens about nursing activities**

The data collection period was from October 1, 2020 to August 30, 2021. The time required for the questionnaire was about 30 minutes by filling out a pre-questionnaire, watching a 360-degree hospitalization guide video, and filling out a post-survey.

### 2.5 Ethical Considerations

This study was conducted after receiving approval from the Research Ethics Committee of D University (1041493-A-2020-010). The research was conducted after confirming that participation in the study was made with voluntary consent.

### 2.6 Data Analysis

The collected data were subjected to a two-sided test at the significance level ( $\alpha$ ) of 0.05 using the IBM SPSS Statistics 22.0 program, and the detailed statistical analysis method is as follows.

- The general characteristics of the subjects were analyzed as real number, percentage, mean, and standard deviation.
- Subject's anxiety, safety perception and satisfaction were analyzed as mean, standard deviation, minimum and maximum values.
- Differences in subjects' anxiety and safety perceptions were calculated by Wilcoxon signed rank test.

## 3. RESULTS

### 3.1 General Characteristics

Table 1 shows the general characteristics of the subjects. The subjects were 63.2% female and 36.8% male, and the average age was  $55.74 \pm 13.51$  years. Relationships with patients were spouse 36.8%, daughter or son 26.3%, parent 5.3%, other 31.6%. No hospitalization experience was found in 68.4% of the cases. 31.6% of the cases have been admitted to the intensive care unit.

**Table 1. General characteristics of participants (N=19)**

Variables	Categories	n	%	M $\pm$ SD
Gender	Female	12	63.2	
	Male	7	36.8	
Age(year)				55.74 $\pm$ 13.51
Relationships with patient	Spouse	7	36.8	

	Daughter or son	5	26.3
	Parents	1	5.3
	Others	6	31.6
Experience of ICU	Yes	6	31.6
	No	13	68.4

### 3.2 Comparison of Research Subjects' Anxiety and Safety Awareness

Table 2 shows the comparison of the subjects' anxiety and safety awareness. Anxiety before intervention had an average score of  $6.21 \pm 2.30$  and post-intervention anxiety had an average score of  $3.95 \pm 2.46$ , which was statistically significant ( $z=4.13, p<.001$ ). The subjects' safety awareness before the intervention was on average  $4.08 \pm 0.39$  points, and the safety awareness after the intervention was on average  $4.54 \pm 0.48$  points, which was statistically significant ( $z=5.00, p=.001$ ).

**Table 2. Changes in anxiety and safety awareness of participants (N=19)**

Variables	Before	After	z	p
Anxiety	$6.21 \pm 2.30$	$3.95 \pm 2.46$	4.13	<.001
Safety Awareness	$4.08 \pm 0.39$	$4.54 \pm 0.48$	5.00	.001

### 3.3 Satisfaction with the 360-degree Hospitalization Guide Video of Study Subjects

Table 3 shows the satisfaction of the study subjects with the 360-degree hospitalization guide image. The item with the highest satisfaction was 'I think I can understand and perform 360-degree hospitalization guide content well' with a score of  $4.58 \pm 0.51$ , and the item with the lowest satisfaction was 'The duration of 360-degree hospitalization guide content is appropriate.'  $4.16 \pm 0.96$  It was 0.96 points.

**Table 3. Satisfaction with 360-degree hospitalization guide content of participants**

Variables	Min	Max	M $\pm$ SD
The duration of the video is appropriate was easy to understand	3	5	$4.42 \pm 0.61$
The language used for 360-degree video content is appropriate	3	5	$4.47 \pm 0.61$
Contents of 360-degree hospitalization guide content are beneficial	3	5	$4.42 \pm 0.69$
Interest in ICU nursing has increased	3	5	$4.53 \pm 0.61$
I think I can understand and perform 360-degree hospitalization guide content well	4	5	$4.58 \pm 0.51$
The duration of 360-degree hospitalization guide content is appropriate	2	5	$4.16 \pm 0.96$
The materials used are appropriate	4	5	$4.53 \pm 0.51$
The screen quality is good	1	5	$4.32 \pm 1.00$
The sound quality is good	3	5	$4.42 \pm 0.69$

## 4. CONCLUSION

This study was to provide a 360-degree video on intensive care unit admission guidance to family members admitted to the intensive care unit. There was a difference in anxiety and safety perception, and satisfaction about 360-degree video on intensive care unit admission guidance was high. In a previous study that applied 360-degree video to inactive nurses, satisfaction with education was high and confidence in skills was

significant.[14]. In a previous study that applied VR 360-degree video content to graduate-grade nursing students for intravenous infusion education, there was also an effect on empathy and immersion[15]. 360-degree video allows you to immerse yourself in the situation by indirectly experiencing the real environment. This study was conducted in a self-report method by a small number of subjects, so there is a limitation in generalization. We propose to compare the effects by applying various interventions and expanding the subjects in future studies. And, we propose to verify the effectiveness of how much the application of the contents developed in this study has affected the nurse's work. In addition, it is necessary to check the results suitable for the field by applying various hospitalization guidance contents.

## **Acknowledgement**

This work was supported by National Research Foundation of 2019 (NRF-2019R1F1A1062478).

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