

## Nurses' Safety in the Hospital Environment: Evolutionary Concept Analysis

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**Purpose:** The purpose of this study was to analyze the concept of nurses' safety within the context of the hospital environment. **Methods:** We used Rodgers' method of evolutionary concept analysis and reviewed the relevant literature and noted and categorized characteristics that appeared frequently. **Results:** Nurses' safety was defined as safe status and safe activity among nurses. Three key defining attributes were identified as: (a) the minimization of actual or perceived risk, (b) personal duties and rights, and (c) ensuring within a safe working environment. Antecedents of nurses' safety were categorized into three dimensions: (a) individual, including vigilance and knowledge gained through education and training; (b) institutional, including safety provision in the organizations; and (c) national, including legislation. The outcomes of nurses' safety included the following: (a) continued competence in nurses' work; (b) enhancement of the quality of patient care; and (c) reductions in nurses' turnover rates. **Conclusion:** Nurses' safety ensures that qualified nurses are able to continue to perform their duties and provide good patient care. The findings of this study could contribute to future research examining nurses' safety. In addition, appropriate tools must be developed to measure the concept.

**Key Words:** Nurses' safety, Hospital environment, Concept analysis

### INTRODUCTION

#### 1. Background

Nursing is involved with a higher incidence of work-related injury than other occupations since nurses are professional personnel on the front line in a complicated healthcare system. Healthcare workers' risk of illness and injury is likely to increase, because nurses are working hard, their work has three shift patterns which keep changing, and experience stress resulting from caring for seriously ill patients [1]. The complexity of patient care increases nurses' risk of injury, which has adverse consequences, such as absenteeism, burnout, reduced retention, and high turnover at both organizational and individual levels [2].

From the report of 2012 working health guidelines for

hospital nurses in Korea that nurses working in hospitals experience health problems related to exposure to hazardous materials, frequent shift rotation, long working hours, musculoskeletal injuries resulting from moving patients, and stress caused by dangerous working conditions. Moreover, the number of work-related injuries reported for nurses ranged from 140 to 202 and accounted for 5.4~7.4% of all public health injuries reported between 2009 and 2011. Further, the types of injury reported during this period were classified as general injury (75.6~84.3%), death (0.5%), and work-related illness (15.7~24.4%) [3].

Numerous studies have examined patient safety and safe environments for patients. In addition, patient safety has been positively associated with nurses' safety as patients and nurses share the same environment [4]. When nurses' safety was ensured, their satisfaction and retention rates increased, their work-related stress decreased, and

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patients' satisfaction increased [4]. The number of nurses in Korean hospitals has increased, and they have received attention because they endure heavy workloads and exposure to harmful factors [3]. However, few studies have examined nurses' safety, and the concept of nurses' safety in a hospital environment is unfamiliar and confusing to nurses since nurses, themselves do not differentiate their safety from patients' safety. Consequently, nurses consider their own safety less important than that of patients [1]. Therefore, there is a need to clarify and analyze the concept of nurses' safety.

Concept analysis involves a process in which the basic elements of a concept are examined and is particularly useful in refining ambiguous concepts. It helps to clarify overused or equivocal concepts in nursing practice, particularly those involving terms that remain undefined and abstract [5,6]. Researchers usually use Walker and Avant's concept analysis method to clarify ambiguous concepts. In fact, the concept of nurses' safety in hospital environments has changed over time. Historically, healthcare providers considered their own health to be not as important as that of patients, but this has changed. According to Rodgers' [6] evolutionary approach, concepts are timeless and have detectable boundaries. In addition, the attributes of a concept can change over time via purposeful redefinition to ensure that it remains useful, applicable, and effective. Rodgers' [6] evolutionary method of concept analysis postulates that concepts are "dynamic rather than static" and heavily influenced by "socialization and public interaction" [6].

The hospital environment is one in which nurses socialize with other healthcare providers and interact with patients and families. The use and application of the term "nurses' safety" has changed over time. Two decades ago, nurses' safety was not of concern in occupational society. However, it has recently become an issue, as the rate of work-related injury for nursing personnel is higher than those observed for other occupations [1]. Once injured, nurses' satisfaction levels and the quality of patient care decrease as nurses' safety is linked to that of patients [1]. In this way, the concept of nurses' safety has been changed within a hospital environment. Thus, for this study, we used Rodgers' method to clarify and analyze the concept of nurses' safety in a hospital environment.

## 2. Study Purpose

This study aimed to analyze the concept of nurses' safety and to clarify its attributes, antecedents, consequences, and implications. Rodgers' evolutionary method of concept analysis [6] was used to clarify the current under-

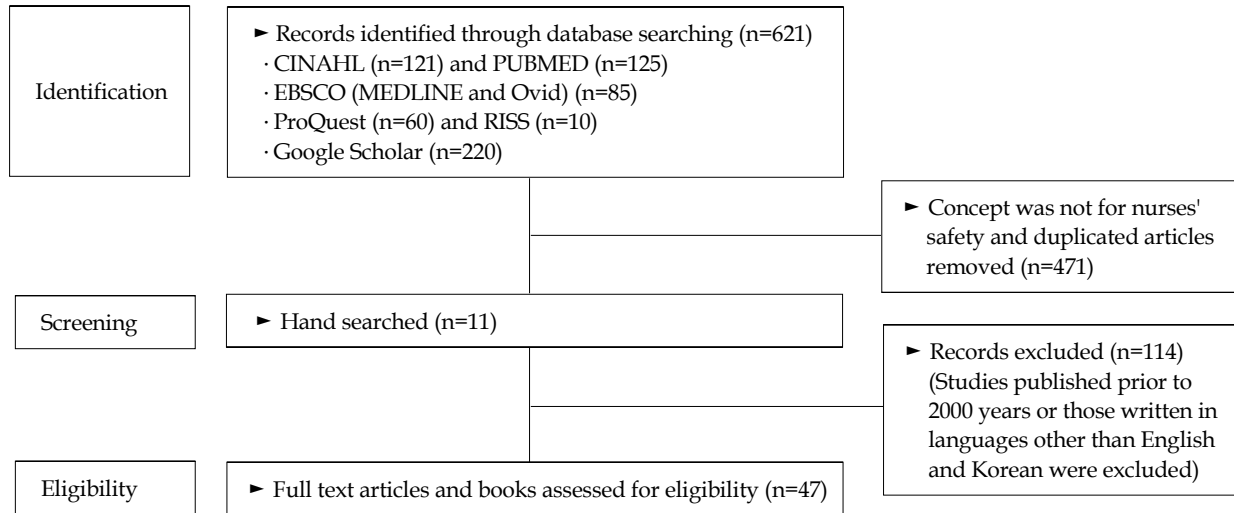
standing of the term "nurses' safety."

## METHODS

### 1. Study design

Rodgers' concept analysis is performed by means of the evolutionary model. It has developed as a cycle and continues by means of time and within a particular context. Moreover, it focuses on three aspects of concept development: "significance," "use," and "application" [6]. "Significance" involves characterization of the phenomenon, "use" involves "uncovering the attributes" of the concept, and "application" occurs when a concept is associated with "use" in the context [6]. In this study, "significance" is the purpose of analysis of the concept, "use" is analysis of the concept of nurses' safety, and "application" is how nurses' safety appears in nursing practice.

- Step 1: This step involved identification of the concept of interest and associated expressions (including surrogate terms). The concept of interest was nurses' safety. We were also interested in nurses currently working in hospitals and exposed to various hazards within their working lives. To provide a wider scope for the concept, two researchers identified additional terms, such as "nurses' health without harm," "nurses' well-being without harm," "safe working conditions for nurses," and "injury prevention," and defined them as surrogate terms for nurses' safety.
- Steps 2 and 3: These steps involved the identification and selection of an appropriate setting and sample, collection of relevant data to identify the concept's attributes and contextual basis, and a comprehensive internet-based review of relevant literature published between 2000 and 2016. To identify this literature, two researchers collaborated to determine key terms, such as "nurses and safety," "nurses and health," and "nurses and well-being," and searched the following databases: CINAHL, PUBMED, MEDLINE (EBSCO and Ovid), ProQuest, RISS, and Google Scholar. The search revealed 621 potentially relevant articles related to nursing practice. Of these, 471 that were duplicates or pertained to patients' or nursing students' safety were eliminated, leaving 150 articles and books. After that, eleven additional articles were identified via a hand search. Thereafter, 114 articles published prior to 2000 or in languages other than English or Korean were excluded. In total, 47 articles (45 in English and two in Korean) were ultimately included in the study (Figure 1). No formal method was used to assess arti-



**Figure 1.** Process for nurses' safety literature search and study selection.

cle quality; however, two researchers critically reviewed and evaluated the articles.

- Step 4: This step involved the analysis of data to identify characteristics. Following the article selection process, two researchers read the articles carefully and objectively to analyze the concept. Each line of text was highlighted and coded according to its reference to attributes, antecedents, and consequences for the concept of nurses' safety in a hospital environment. Two researchers then listed and categorized the attributes, antecedents, and consequences observed frequently in the selected articles.

## RESULTS

### 1. Definitions of Nurses' Safety in the Literature

According to The American Heritage Dictionary [7], nurses' safety refers to when "a nurse is in a state of being protected from potential harm or something that has been designed to protect and prevent harm." Nurses' safety referred to both safe practices and the condition of being safe. Basic safety encompassed various measures. At an individual level, nurses' safety required personal accountability, which included awareness of unsafe activities and vigilance in promoting a culture of safety [8]. In addition, organizations were required to provide security and safety resources and abide by and enforce protocols designed to create safe work environments for nurses. When appropriate safety measures were taken, nurses were protected, allowing them to perform their tasks without interruption [9].

Dawes [10] said that all nursing tasks involved risk, health hazards, and safety issues. However, if nurses were unhealthy, they could not provide the physical and emotional care that patients deserved. Therefore, it is necessary to understand the antecedents of nurses' safety to minimize the effects of hazardous situations on nurses. Within hospital settings, nurses were required to evaluate situations realistically to prevent injury and encourage safe practice. Therefore, they should consider using different methods and evaluate actions that could protect their health and that of their patients [10]. The improvement of nurses' working conditions enhanced the quality of patient care [11].

### 2. Attributes

The review of the selected articles showed that nurses' safety was described as involving the following attributes: the minimization of actual or perceived risk, personal duties and rights, and ensuring within a safe working environment.

#### 1) The minimization of actual or perceived risk

Because of the nature of nursing practice, nurses faced risk in the workplace [1]. This could result in significant acute and long-term adverse health outcomes for nurses. Hazards commonly observed in hospitals included actual physical and environmental hazards-toxic chemicals, radiation, infectious diseases-and psychosocial hazards such as stress [1,12,13]. In addition, nurses perceived an increase in risk after experiencing physical and psychological demands, such as shift changes, long working hours,

and overtime requirements at work [14]. The health risks faced by nurses, including physical demands such as lifting or moving patients, standing for long periods, chemical exposure, and potential exposure to violence, continued for the duration of nurses' employment in hospitals [14]. In addition, nurses were expected to work hard in such situations. Therefore, while dealing with these issues, nurses need to maintain their own health and safety [1,15]. If a hazardous substance cannot be eliminated, minimization of exposure or perceived risk is required to ensure nurses' health and well-being [16].

## 2) Personal duties and rights

The implementation of measures to ensure employees' health and safety in hospital environments was important in the delivery of care in healthcare systems. In addition, as healthcare providers, nurses were required to consider means through which to keep their work environments safe for their patients and colleagues [17]. Healthcare workers' behavior could either increase or reduce the risk of injury [1]. According to Griffith [15], nurses and their employers should work together to ensure the implementation of health and safety measures in the workplace. While safe hospital environments could protect healthcare workers, safety was accomplished through individual efforts to engage in safe practices [13]. In addition, the implementation of measures to ensure staff members' health and safety is a legal requirement in the Occupational Health and Safety Act in Korea, which requires assessment of workplace risk as failure to identify hazards is likely to increase the severity of harm. Therefore, this law stipulates that risks should be reduced so far as is reasonably practicable [3]. In addition, healthcare workers have the right to be protected from harm [17].

## 3) Ensuring within a safe working environment

Safety culture is an important issue in hospital environments and reduces exposure to risk in the workplace. Some studies reported that organizational culture was associated with all types of injury in nurses [13]. The structure and design of healthcare environments could affect the health and well-being of patients, nurses, and visitors. The back, neck, and leg strain and injury described by nurses was likely to be related to the poor design of work areas, and the results of some studies suggested that unit design contributed to fatigue and back pain in nurses [18]. The American Nurse Association [19] defined "a healthy workplace" as one that is safe and satisfying. In fact, leaders, managers, healthcare workers, and bedside staff could establish a culture of safety. When all of these individuals

accepted responsibility as part of a patient-centered team, they performed their duties with consideration of the health and safety of both patients and healthcare workers. A culture of safety protected workers' health and safety and was included in management commitment, communication, safety prioritization, and supported for safe working practices and work environments that were supportive of safety and minimal work-related burden. Nurses' safety could be ensured via a culture of safety in hospitals [13,19].

## 3. Antecedents

We classified antecedents into three dimensions: individual, which included vigilance and knowledge gained through education and training; institutional, which included safety provision within organizations; and national, which included legislation.

### 1) Individual dimension

#### (1) Vigilance

Brinia and Antonaki [12] reported that nurses were exposed to numerous types of safe risk factors, including physical, biological, chemical, and psychological, on a daily basis. In fact, many nurses were unaware of toxic substances and their adverse effects on health in the workplace; therefore, they should improve their knowledge regarding exposure to toxins at work [16]. Nurses' recognition and awareness of these factors could help to ensure safe hospital environments for themselves and patients. In addition, hospitals should increase awareness of risk and encourage nurses' efforts to promote safe practice [8,15, 17]. Trim and Elliot [20] reported that the Royal College of Nursing and UNISON, Britain's largest trade union, raised awareness regarding sharps injuries and occupational transmission of blood-borne pathogens in the United Kingdom. This led to the establishment of the "Safer Needles Network," which included healthcare professionals with expertise in treating sharps injuries. Such programs suggested that nurses required in-depth understanding of occupational risks and awareness of the preventive strategies available to them, because they faced occupational hazards [1].

#### (2) Knowledge gained through education and training

Education and training constituted an important component of nurses' safety [2]. Although nurses could not avoid exposure to toxins in the workplace, knowledge of the dangers of cumulative exposure could allow them to limit their contact with toxins as much as possible [16].

Smith [16] stated that nurses required education to make changes in the workplace. Nurses and other healthcare providers should also receive training in locating information regarding ways to protect their health. A report regarding nurses' safety emphasized the role of education and training in anatomical functioning. Moreover, new models of education were required to foster staff competence, which could lead to a reduction in the number of work-related injuries that occurred in patient care settings [12,21-23]. Nelson and Baptiste [22] posited that the prevention of injuries resulting from patient handling required not only equipment with which to move patients but also appropriate training in handling the equipment.

Through education, nurses could develop their knowledge regarding toxic substances and limit their exposure as much as possible, ensuring their safety. Furthermore, nurses should educate other nursing staff and be willing to learn from experts [2,16].

## 2) Institutional dimension

### (1) Safety provision in organizations

Healthcare organizations controlled their employees' workloads. Decisions made at an institutional level influenced workers' health and safety [13]. The Institute of Medicine's report, "To Err is Human," suggested that nurses' exposure to toxic materials affected patients' overall health and safety. Therefore, it was necessary to promote excellent systemic support to ensure the health and safety of nurses and other healthcare providers [24]. In one study, organizations with reputations as excellent workplaces for nurses were associated with low injury rates in healthcare workers [25]. Administrative control strategies included management-dictated working practices and policies; modification of rules, procedures, duties, or shift duration; job rotation; and the provision of training in the recognition of risk factors [1,17,26]

## 3) National dimension

### (1) Legislation

Several factors influenced both nurses' and patients' safety. Legislation could be used to initiate procedures designed to ensure safety for nurses and patients. In addition, nurses could promote their own safety and that of others through the implementation of regulations. Moreover, the interaction between politics, policy, and advocacy could help to create safe working conditions for nurses [1]. Trim and Elliott [20] reported that the provision of activities designed to increase healthcare providers' knowledge, including sharps awareness campaigns and education, was required to reduce their risk of sustaining sharps

injuries. In addition, legislation was passed to protect healthcare providers from sharps injuries, and healthcare organizations were required to implement protective devices for employees [20]. The federal Needle Stick Safety and Prevention Act was approved in the United States in late 2000, and specific provisions to ensure healthcare workers' safety were established in public law and took effect on April 18, 2001. Healthcare facilities have since been obliged to eliminate or reduce healthcare workers' exposure to blood-borne infections and provided safer devices for injection and intravenous treatment. Healthcare organizations' implementation of safety regulations for hospital employees was no longer a recommendation and became a matter of law [27].

## 4. Consequences

The consequences of nurses' safety included continued competence in nurses' work, enhancement of the quality of patient care, and reductions in nurses' turnover rates.

### 1) Continued competence in nurses' work

Nurses' safety should allow them to continue to help patients [9] as they were unable to when they experienced injury, illness, infection, stress, or burnout [11]. Nurses typically focused on the provision of high quality nursing care. However, nurses should take care of themselves to maintain their ability to provide care for patients and preserve the quality of the services that they provide [1]. When nurses' workplaces were safe, they were able to practice without the threat of injury. Additional advantages of safety in the workplace included increased job satisfaction, lack of pain, and sustainability in professional careers. All of these factors allowed nurses to continue to work competently [2].

### 2) Enhancement of the quality of patient care

If nurses were concerned about their safety, this interfered with their ability to deliver high-quality care. Moreover, patients did not receive the standard of care that they deserved while nurses were stressed, overworked, and worried about their own health and safety [1,19]. Some studies reported that, when nurses were injured or involved in accidents in the workplace, patients were placed at risk because nurses could make mistakes such as those involving medication errors, failure to notice patients' symptoms, and failure to rescue [1,19]. Nurses and patients shared the same hazards, as they shared the same environments. Therefore, improvement of nurses' well-being enhanced that of patients [11,13,23]. There was a clear



link between patients' and nurses' safety, improvement of nurses' safety, comfort, and dignity was shown to benefit patients [1,2].

### 3) Reductions in nurses' turnover rates

In an online survey conducted by the American Nurses Association, 88% of nurses reported that health and safety concerns influenced their decision to remain in the profession [23]. No nurse was protected from risk entirely. In fact, the negative consequences of risks to nurses' health included increased sick leave, absenteeism, conflict, job dissatisfaction, reduced retention rates, and high turnover rates [2,25]. In addition, stress resulting from working in an unsafe environment could lead to various work-related problems such as staff conflict, high staff turnover rates, and reduced practice effectiveness [2]. The establishment of healthy work environments could increase nurses' job satisfaction and retention rates. When employee safety was considered and valued, employees were felt appreciated [4].

With the essential elements of the concept in mind, nurses' safety was considered to involve the following attributes: the minimization of actual or perceived risk, personal duties and rights, and ensuring within a safe working environment. The antecedents of nurses' safety included the need for nurses to be vigilant and possessed know-

ledge regarding health and safety, the need for organizations to implement safety measures for nurses, and the need for legislation to protect nurses from risk. Once nurses' safety was established, they were able to continue working competently; in addition, the quality of patient care enhanced, and turnover rates decreased. The attributes, antecedents, and consequences of nurses' safety are shown in Figure 2.

### 5. Identification of a Model Case (Exemplar)

A nurse named Jenny had been working in the intensive care unit at a university hospital for eight years. One day, while working with severely ill patients, she noticed that one of the patients was coughing up blood. The patient was cachectic and told her that he had been feverish for three months. At first, she hesitated to transfer him to a respiratory isolation room, even though she suspected that he had tuberculosis. Patient transfer involved several tasks and could have caused a delay in Jenny's work. However, she decided to transfer the patient, because she did not want to put the other patients, her colleagues, or herself at risk for tuberculosis infection. This transfer ensured minimal exposure to the patient for Jenny, her colleagues, and other patients. In addition, she and her colleagues had the right to be protected from risk of infection. Therefore, she

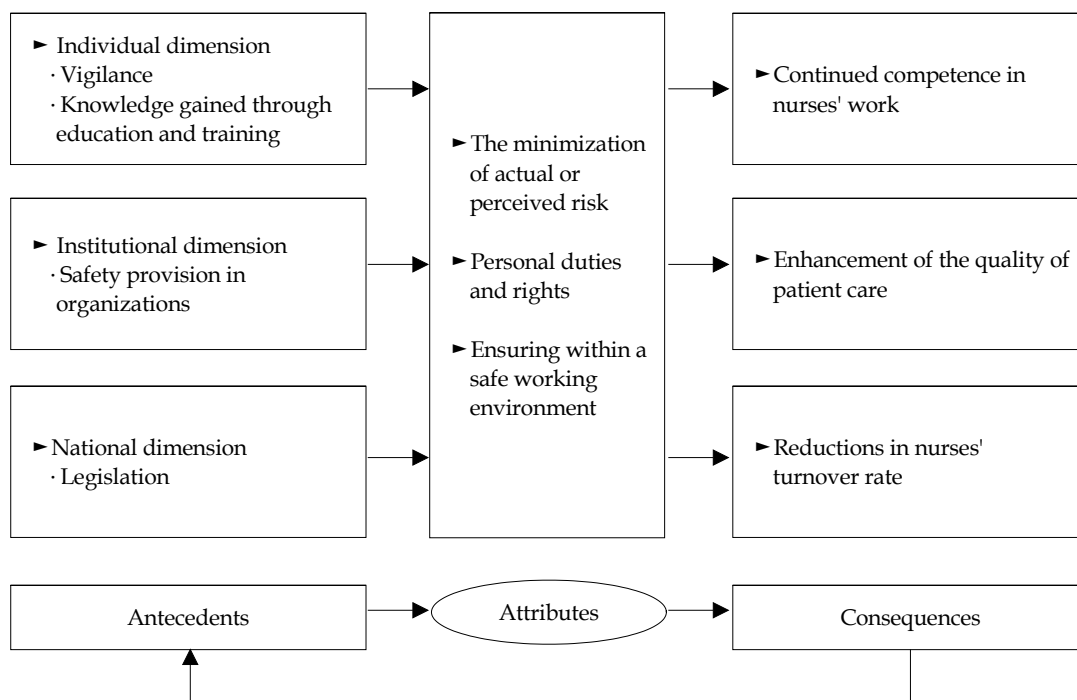


Figure 2. Schematic model of nurses' safety, including its attributes, antecedents and consequences.

immediately covered the patient's mouth with a simple mask, and she and the other nurses wore special masks, followed the infection protocols taught at an infection education class, and transferred the patient to an isolation room with the help of the nursing supervisor.

## 6. Surrogate Terms and Related Concepts

Rodgers [6] stated that surrogate terms could be used to express a concept in multiple ways, and related concepts helped to increase the significance to the concept of interest. Therefore, two researchers carefully selected surrogate terms such as "nurses' health without harm," "nurses' well-being without harm," "safe working conditions," and "injury prevention."

## DISCUSSION

As stated by Rodgers [6], the purpose of interpreting the results of concept analysis should not be to provide a final solution or "crystal clear" notion of what a concept is. Instead, the aim is to provide the foundation necessary to enhance the concept to be developed. In other words, the interpretation of concept analysis is a starting point rather than an end [6]. Therefore, nurses' safety should be interpreted within a hospital environment. The results showed that nurses' safety concerns changed with changes in the hospital environment. People outside of the hospital generally consider hospital environments and healthcare providers to be safe [3]. However, nursing has one of the highest rates of work-related injury in the United States, and issues regarding healthcare workers' safety receive nationwide attention [28]. The matter is one of increasing public concern not only in the United States but also in Korea [3]. In addition, it is critically important to increase nurses' safety, which enhances that of patients [23].

Studies involving safety focused primarily on patient safety and safe environments for patients, and most discussed ways in which nurses could prevent patient injury. In fact, our findings suggested that nurses require safe conditions and a safe environment to continue to perform their duties and provide high-quality care. Consideration of employees' health at work should involve both personal and organizational factors as health is associated with the organizational climate and individual demographic characteristics including age, education, and socioeconomic status. Organizational culture determines safety levels, and managers' commitment to safety is an indication of this culture [29].

Although nurses' safety involved personal duties and

rights, this basic working requirement required antecedents at individual, institutional, and national levels. To ensure their own safety and that of others, nurses should be vigilant and obtain knowledge through education and training. In addition, while hospitals are usually responsible for the health and safety of their employees, many do not assess work-related risk or modify institutional preventive and corrective measures to ensure that they are appropriate. Further, hospital workers' unsafe practices, lack of awareness, and poor compliance with basic preventive measures contributed to work-related risk [13]. Therefore, scheduling, policy enforcement, and the provision of a safe physical work environment are important components of nurses' safety at work [13]. If nurses are provided with safe working environments, certain factors, such as reasonable working hours, institutional support, and safety policies regarding potential injury, could reduce the incidence of work-related injury and improve workers' safety [30].

An online staffing study conducted by the American Nurses Association in 2000 found that 38.1% of nurse respondents felt inadequately informed about workplace dangers. In addition, nurses' safety concerns reflected reductions in job satisfaction and patients' safety. Registered nurses in the United States reported that health and safety concerns were important in their decision as to whether to remain in their profession [19]. As safety hazards can terminate careers prematurely or have fatal consequences, consideration of nurses' safety is very important [30].

The exploration of the concept of nurses' safety was restricted to hospitals and was therefore limited. Understanding of this concept in industrial settings and the community is also important and could produce different results. Currently, hospitals in Korea are divided into first-, second-, and third-level hospitals and different levels are followed by number of beds and specialties in a hospital. The systems and environments in third levels hospitals are more complicated than those in first and second level hospitals. Therefore, the concept of nurses' safety could differ according to hospital level. Further concept analysis of nurses' safety, with consideration of the various hospital levels in Korea, is required.

## CONCLUSION

The results of this concept analysis indicated that nurses' safety involved personal duties and rights and the minimization of actual or perceived risk. In addition, nurses' safety was ensured in safe working environments. Nurses could ensure their own safety through increased vigilance

and knowledge. In addition, organizations could ensure nurses' safety via adherence to safety laws and the implementation of safety measures that benefit nurses. The implementation of measures to ensure nurses' safety in hospitals could increase nurses' satisfaction, reduce turnover rates, and allow nurses to work continuously and provide high-quality care to patients.

Criteria concerning nurses' safety could change over time, reflecting changes in hospital environments. In accordance with the present findings, we recommend the development of a reliable tool through which to assess nurses' safety in quantitative research and provide evidence of nurses' actual experiences of safety in hospitals. Hospital employees and patients should be protected from health and safety risk as much as possible.

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