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Effects of Anxiety, Resilience, and Self-efficacy on the Professional Competence of Nurses during the COVID-19 Pandemic

Pratibha Bhandari[1], Jinsook Kim[2], Su Kyoung Chung[3*]
[1]Lecturer, University of Technology Sydney, NSW, Australia
[2]Assistant, [3]Associate Professor, Dept. of Nursing, College of Welfare, Woosong University

COVID-19 팬데믹 동안 간호사의 불안, 회복탄력성, 자기효능감이 전문직 역량에 미치는 영향

Pratibha Bhandari[1], 김진숙[2], 정수경[3*]
[1]호주 University of Technology Sydney 전임강사, 우송대학교 보건복지대학 간호학과 [2]조교수, [3]부교수

Abstract This study was conducted to examine the relationship of the COVID-19-related anxiety, self-efficacy, resilience, and professional competence of nurses working in hospitals where COVID-19 patients are hospitalized. Additionally, this study attempted to identify factors that affect the professional competence of nurses. Using a cross-sectional descriptive study design, an online survey of 120 nurses working at hospitals where COVID-19 patients were hospitalized was conducted between February 9 and February 19, 2021. Pearson's correlations were used to assess correlations between the main variables, and stepwise multiple regression was used to identify factors influencing professional competence. Results of the study showed that the professional competence of nurses was positively correlated with self-efficacy (r=.58, p<.001) and resilience (r=.56, p<.001). The correlation between professional competence and COVID-related anxiety was not significant (r=-.03, p=.766). Factors affecting professional competence included self-efficacy (β=.36, p=.004) and resilience (β=28, p=.021). The model explained approximately 35% of the variance in nurse professional competence (F=33.65, p<.001). To fully demonstrate the professional competence of nurses during the COVID-19 pandemic, institution-based programs should be developed and applied to improve their self-efficacy and resilience. In order to prevent the burnout of nurses in the longer-than-expected COVID-19 pandemic, efforts and policies at the nursing organization level are needed to systematically manage and monitor self-efficacy and resilience of nurses.

Key Words : Anxiety, Resilience, Self-efficacy, Professional competence, Nurses

요 약 본 연구는 COVID-19 팬데믹 상황에서 COVID-19 환자가 입원한 병원에서 근무하는 간호사들의 불안, 회복력, 자기효능감 및 전문직 역량 간의 관계를 파악하고, 간호사의 전문직 역량에 미치는 요인을 파악하고자 시행되었다. 2021년 2월 9일부터 19일까지 코로나 환자가 입원한 병원에서 환자간호에 참여하는 간호사들을 대상으로 온라인 설문 조사하였으며 총 120명이 참여하였다. 자료분석은 Pearson's correlation과 stepwise multiple regression을 사용하였다. 연구결과 간호사의 전문직 역량은 자기효능감(r=.58, p<.001) 및 회복탄력성(r=.56, p<.001)과 양의 상관관계가 있었다. 전문직 역량에 미치는 요인은 자기효능감(β=.36, p=.004) 과 회복탄력성(β=28, p=.021)이었으며 이 모형의 설명력은 전문직 역량 분산의 약 35%를 설명하는 것으로 나타났다. COVID-19 팬데믹 동안 간호사의 전문직 역량을 제대로 발휘할 수 있도록 병원 기반 프로그램을 개발하고 적용하여 자기효능감과 회복탄력성을 향상시켜야 한다. 예상보다 긴 COVID-19 팬데믹 상황에서 간호사의 소진을 예방하기 위해서는 간호사의 자기효능감과 회복탄력성을 체계적으로 관리하고 모니터링할 수 있는 간호조직 차원의 노력과 정책이 필요하다.

키워드 : 불안, 회복탄력성, 자기효능감. 전문직 역량, 간호사

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*Corresponding Author : Su Kyoung Chung(skyoung1@wsu.ac.kr)
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1. Introduction

Since COVID-19 was declared a pandemic by the World Health Organization in March 2020, increased patient influx has strained healthcare systems globally [1]. Nurses who care hospitalized patients suffer from anxiety, depression, burnout, depersonalization, lack of professional accomplishment, and other physiological symptoms, such as insomnia [2-4]. The International Council of Nurses reported that around 1.6 million healthcare workers were infected with COVID-19 by December 2020 [5]. Around half of the infected healthcare workers were nurses [6]. Nurses continue to serve as indispensable frontline workers despite personal fear, anxiety, and other negative emotions associated with the pandemic. During the COVID-19 pandemic, increased workload, limited opportunities to socialize, and greater emphasis on dealing with the crisis have reduced social and professional development opportunities in many healthcare institutions. In other words, nurses suffer from anxiety and burnout, while leisure and professional development opportunities are almost non-existent.

Previous studies conducted during the COVID-19 pandemic have reported prevalence rates of anxiety, depression, and burnout among healthcare workers of 57%, 27%, and 38.9%, respectively [2, 3, 7]. Risk factors identified for negative psychological symptoms included female sex, young age, low socioeconomic status, fear of contracting COVID-19, COVID-19 infection in family or friends, and lower level of COVID-19 related training [2, 4, 8]. Protective factors against negative psychological symptoms were good social support, adequate medical resources, an efficient healthcare system, perceived safety of personal protective equipment, and higher resilience and self-efficacy [4, 8-11].

Nurses are expected to be professionally competent and deliver high-quality care under all circumstances despite the external health scenarios. According to the US Quality and Safety Education for Nurses, professional competence includes knowledge, skills, and attitudes related to patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics [12]. Nursing competence is acquired through knowledge and experience [13] and varies significantly with experience, education levels [14], work environment [15], and availability of professional support (e.g., preceptorship) [16].

In the context of the COVID-19 pandemic, nurses' professional competence may be affected. Nursing competence requires integrating, adapting, and applying knowledge, skills, and attitudes to evolving nursing situations to provide safe, effective, and high-quality nursing care. However, negative psychological states like anxiety and fear related to the COVID-19 pandemic may affect clinical decision-making and performance as they work in a complex health environment. While there are numerous studies reporting the prevalence of anxiety among nurses, studies exploring the effects of anxiety on nursing competence during the COVID-19 pandemic are almost non-existent.

Resilience and self-efficacy have been identified as characteristics that help nurses cope during adverse situations [4, 7 9] to provide high-quality care [11]. Resilient nurses experience lower levels of burnout, depression, and anxiety [7]. Younger, less-experienced nurses have a lower level of resilience [10, 17], which affects their professional competence and quality of care. Because resilience can be developed and strengthened, it is imperative to assess and enhance the resilience of nurses to ensure a healthy workforce that can deal with the COVID-19 pandemic and public health crises.

Furthermore, self-efficacy directly affects nursing performance; nurses with higher self-efficacy cope better with demanding situations [18]. However, under unforeseen circumstances, such as the COVID-19 pandemic, nurses may have low self-efficacy, which can be related to other psychological and physiological symptoms [19]. Hence, it is of

paramount importance to assess the self-efficacy of nurses, to identify elements that must be improved to protect their psychological health and improve patient care.

Previous studies have explored the psychological, physiological, and organizational factors related to the effects of the COVID-19 pandemic on healthcare workers. However, there are few studies on the relationships between these factors and the professional competence of nurses. In this pandemic era, it is necessary to think about ways to improve the professional competence of nurses. Therefore, it is necessary to identify the effects of COVID-19 related anxiety, resilience, and self-efficacy on the professional competence of nurses during the COVID-19 pandemic. It is expected that the results will facilitate the planning of interventions that promote the psychological well-being of nurses and strengthen their professional competence.

This study was conducted to investigate the relationship between COVID-19 related anxiety, self-efficacy, resilience, and professional competence of nurses working in hospitals where patients with COVID-19 were hospitalized. In addition, the study attempted to identify factors affecting professional competence. The objectives of this study were as follows: to determine the levels of anxiety, resilience, self-efficacy, and professional competence among nurses working in hospitals where COVID-19 patients are hospitalized; to investigate the correlations among anxiety, resilience, self-efficacy, and professional competence of nurses working in hospitals where COVID-19 patients are hospitalized; and to understand the effects of anxiety, resilience, and self-efficacy on the professional competence of nurses working in hospitals where COVID-19 patients are hospitalized.

2. Method

2.1 Study Design

A cross-sectional, descriptive study was adopted for this study.

2.2 Participants and Data collection

Participants were nurses working at hospitals where COVID-19 patients were hospitalized in South Korea. Data were collected via an online Google survey during February 2021. A total of 120 nurses responded to the online questionnaire. The required sample size was calculated by G* Power (version 3.1.9.7), with a power of .80, a significance level of .05 and effect size of .15 (for a maximum of six predictors in the regression analysis). The required sample size was 98;so it was appropriate because there were 120 subjects included in this study.

2.3 Instruments

2.3.1 COVID-19 anxiety

This study used the Coronavirus Anxiety Scale (CAS), developed by Lee [20] and translated into Korean and validated by Choi, Lee, and Lee [21]. The Cronbach's α values were .92 and .85 for the original and Korean versions, respectively.

2.3.2 Resilience

This study used the Korean version of the Conner-Davidson Resilience Scale (K-CD- RISC, 2003) developed by Baek et al. [22]. This tool consists of five sub-items: 10 items on tenacity, 8 items on persistence, 4 items on optimism, 2 items on support, and 2 items on spirituality. The items are rated on a 5-point Likert scale. Higher scores correlated with greater resilience [23]. The Cronbach's α for the original version was .93, and was .91 for this study.

2.3.3 Self-efficacy

Self-efficacy was measured using a 17-item tool developed by Sherer and Maddux [24]. This tool was translated into Korean and adapted for use in the Korean population by Lee [25]. It was further

modified by Jung [26], and the modified version is was used in this study. The items are rated on a 5-point Likert scale, with higher scores indicating higher self-efficacy. The Cronbach's α of the tool by Jung [26] was reported to be .96, and that for the current study was .94.

2.3.4 Professional competence

The professional competence of nurses was assessed using the Nurse Professional Competence Scale Short Form, which consists of 35 items. This scale was developed by Nilsson, Engstrom, Florin, Gardulf & Carlson [27], and translated into Korean for use in the current study. The original NPC consists of seven-point response item. Dawes [28] reported that data gathered from a five-point format can be readily transferred to seven-point equivalency using a simple re-scaling method. Therefore, a 5-point Likert scale was used in this study to maintain consistency with other survey questionnaires and to increase the response rate. Cronbach's α coefficient at the time of development was .76 for nursing care (5 items), .71 for value-based nursing care (5 items), .79 for medical-technical care (6 items), .82 for care pedagogics (5 items), .86 for nursing documentation and administration of nursing care (8 items), and .84 for development, leadership, and organization of nursing care (6 items). The Cronbach's α in this study was .90.

2.4 Data Analysis

General characteristics of the study participants are presented as frequencies (with percentages) and means (with standard deviations). Correlations between major variables were assessed using Pearson's correlation, and factors affecting the professional competence of nurses were analyzed by stepwise multiple regression.

2.5 Ethical considerations

Before the survey, ethical approval was obtained from the Institutional Review Board of W University in South Korea (no.: 1041549-210105-SB-112). The purpose of the study was explained to participants before data collection. All participants provided informed consent online before the questionnaire was administered. Participation in the study was voluntary and discontinued if desired. Gift vouchers were provided to those who participated in the survey.

3. Results

3.1 Sociodemographic characteristics

The sociodemographic characteristics of the study participants are summarized in Table 1. The mean age of participants was 28.5 years (range: 2343 years); 85.1% were females, 60% were non-religious, and 40% were Protestants, Catholics, or Buddhists. The mean duration of clinical experience of the participants was 3.6 months (range: 1 month 14 years). The majority of the participants were working in special units (64.2%), followed by inpatient wards (30.8%) and outpatient units (4.2%). The participants were working in hospitals of similar sizes (48.3% in general tertiary hospitals and 49.2% in general and smaller hospitals). Most participants worked as staff nurses (51.7%), or as staff nurses with the additional role of charge nurse (30.8%). The most common reason cited for entering nursing profession was the high employment rate after graduation (40.0%), followed by a good match with personal characteristics (30.8%), parents' recommendation (16.7%), and SAT grade (8.3%). More than half of the participants were satisfied with their profession. Almost 69.2% of the participants had cared for COVID-19 patients (Table 1).

3.2 Degree and correlation of the main variables

Degrees of the main variables are summarized in Table 2. COVID-related anxiety was 1.42(±2.69). Self-efficacy was 67.77(±3.99), resilience was 93.92

Table 1. Sociodemographic characteristics and main variable results (n = 120)

Variables	Categories	n (%) Mean±SD
Sex	Males	18 (15.0)
	Females	102 (85.0)
Age (y)*	Under 25	11 (9.2)
	25–29	39 (41.1)
	Over 29	29 (30.6)
		28.49±3.98
Religion	Protestant	18 (15.0)
	Buddhism	11 (9.2)
	Catholic	18 (15.0)
	None	72 (60.0)
Clinical experience(y)	〈 2	31 (25.8)
	2–5	56 (46.7)
	5.1– 9	29 (24.2)
	〉9	4 (3.3)
		3.62±2.79
Unit*	In-patient	37 (30.8)
	Special unit (OR, PACU, ICU, ER)	77 (64.2)
	Outpatient	5 (4.2)
Hospital type*	Advanced general hospital	58 (48.3)
	General hospital	59 (49.2)
Position*	Staff nurse	62 (51.7)
	Charge nurse	8 (6.7)
	Staff/charge nurse	37 (30.8)
Motivation for entering profession *	According to aptitude	37 (30.8)
	High employment rate	48 (40.0)
	Parental advice	20 (16.7)
	SAT grade	10 (8.3)
Satisfaction with nursing Experience with COVID patients	Very satisfied	9 (7.5)
	Satisfied	56 (46.7)
	Moderate	39 (32.5)
	Unsatisfied	14 (11.7)
	Very unsatisfied	2 (1.7)
Experience with COVID patients	Yes	83 (69.2)
	No	37 (30.8)

*missing data excluded. SD: standard deviation, OR: operating room, PACU: post anesthesia care unit, ICU: intensive care unit, ER: emergency room

(±12.67), and professional competence was 142.12 (±18.77).

Table 2. Degree of main variables

Variables	Range	Item mean ±SD	Mean±SD
COVID-related anxiety score	0–10	0.28±0.54	1.42±2.69
Self-efficacy	17–85	3.99±0.59	67.77±3.99
Resilience	25–125	3.76±0.51	93.92±12.67
Professional competence	35–175	4.01±0.54	142.12±18.77

The professional competence of nurses was positively correlated with self-efficacy (r=.58, p〈 .001) and resilience (r=.56, p〈.001). The correlation between professional competence and COVID-related anxiety was not significant (r=-.03, p=.766) (Table 3).

Table 3. Correlations of COVID-related anxiety, self-efficacy, resilience, and professional competence scores

	COVID-related anxiety	Self-efficacy	Resilience
COVID-related anxiety	1		
Self-efficacy	0.04 (.647)	1	
Resilience	−.01 (.934)	.79** (〈 .001)	1
Professional competence	−.03 (.766)	.58** (〈 .001)	.56** (〈 .001)

3.3 Factors affecting professional competence

In order to identify the factors that affect nurses' professional competence in the COVID-19 pandemic, a stepwise regression analysis was conducted by entering self-efficacy and resilience, both of which were significantly correlations with professional competence(Table 4). The Durbin-Watson test was performed to evaluate for autocorrelation; the value was close to 2 (2.19), indicating no autocorrelation. In addition, data were also checked for multicollinearity. The variation inflation factor (VIF) was 2.694, suggesting no multicollinearity. Factors affecting professional competence included self-efficacy (β=.36, p=.004) and resilience (β=.28, p=.021). The model explained approximately 35% of the variance in nurse professional competence (F=33.65, p<.001).

Table 4. Factors affecting professional competence of nurses (n = 120)

Variables	B	β	t	p
Constant	57.45			
Self-efficacy	.67	.36	2.94	.004
Resilience	.42	.28	2.34	.021

F=33.65, p<.001, R=.60, adjusted R^2=.35

4. Discussion

This study was conducted to examine the relationship of COVID-19 related anxiety, self-efficacy, resilience, and professional competence among nurses during the COVID-19 pandemic, and to identify factors that affect professional competence.

First, discussing at the degree of major variables, COVID-19 related anxiety level of the subjects in this study was relatively low at 1.42 points. According to Lee [20] the tool used in this study, it is rare to feel slightly higher degree of anxiety for more than a day or two. In our study, COVID-19 related anxiety was significantly lower than that reported by Labrague & Santos [7]. This difference in results may be because Labrague & Santos [7] collected their data during the early phase of the pandemic, 1 year before the current study. Although the study by Bae, Lee, & Lee [29] was conducted about 5 months before the current study, the anxiety level among nurses was low (anxious for several days), as measered by the questuinnare developed by Choi, Lee, and Lee [21]. When the Korean version of the COVID-19 related anxiety scale was designed and tested, the anxiety level of the general public was found to be relatively low at 1.29 points, as reported by Choi et al. [21]. It is believed that it was higher than a nurse who directly cares COVID-19 patients at the front line. In addition, anxiety levels may differ between countries based on the COVID-19 situation, healthcare environment, and ethnicity.

The degree of resilience of the subjects in this study was slightly higher than 'moderate' with an average of 3.76 (±0.51) points. It was slightly higher than those of Afshari, Nourolahi-darabad & Chinisaz [30], but lower than the resilience of the subjects of Balay-odao, AlQuwez, Inocian & Alotaibi [31]. As the average clinical experience was 3.62 years, the resilience of the subjects in this study may have been slightly high.

Next, the level of self-efficacy of the subjects in this study was higher than normal with an average of 3.99 (±0.59). In the study by Yıldırım & Güler [32], the general population had lower self-efficacy scores (2.87) related to COVID-19, as measured on a 5-point scale, than our participants. The higher self-efficacy among the participants in this study compared to the general population may be because our participants were nurses. Further studies using reliable measurement tools are necessary to confirm this.

The professional competence of the subjects of this study was relatively high with an item mean of 4.01. Although the study by Ahn & Eun [33] used a different measurement tool, the average score on the competence item of their nurses was 3.64, which was lower than that in this study. A majority

of the participants (73.3%) in the study by Ahn & Eun were nurses working in hospital wards; however, in our study, almost 64.2% of the nurses were working in specialized departments, such as the emergency room, intensive care unit, or operating room, which may explain the differences in findings.

In our study, the professional competence of nurses significantly correlated with self-efficacy and resilience, but not with COVID-related anxiety. In this study, COVID-related anxiety and self-efficacy were not significantly correlated, but in the studies of Xiong & Lin [4] and Simonetti et al. (2020), a negative correlation was observed between COVID-related anxiety and self-efficacy. The lack of a significant correlation in our study may be because of the low level of COVID-related anxiety among our participants. However, in our study, there was a significant positive correlation between self-efficacy and resilience, similar to Zeng et al. [34]. Resilience reduces the vulnerability of professional nurses to clinical challenges and difficulties; therefore, it is closely related to self-efficacy. In this study, professional competence was significantly correlated with self-efficacy and resilience, similar to Jo & Sung [35]. Resilience was enhanced by interventions that increase the self-efficacy of nurses with high COVID-related anxiety levels. Hence, it is necessary to develop interventions that increase the self-efficacy of nurses. In addition, self-efficacy and resilience increase nursing performance [35]; therefore, a hospital-wide program that enhances the self-efficacy and resilience will benefit nurses with high COVID-19 related anxiety. In this study, self-efficacy and resilience significantly affected the professional competence of nurses during the COVID-19 pandemic; these findings are consistent with those of a study of hospital nurses [36], which showed that self-efficacy had the greatest influence on work performance. Self-efficacy was also identified as a significant factor in the study by Jo & Sung [35] that included emergency room nurses. Nurses with high self-efficacy provide high-quality nursing care through improved job performance [36]. In particular, work performance is enhanced in patients with high self-efficacy. Therefore, the professional competence of nurses may be increased during the COVID-19 pandemic by programs that promote self-efficacy and improve workload management (e.g., by assigning work based on the competence level of nurses) [37]. In the current study, resilience significantly affected professional competence, similar to Jo & Sung [35]. Because few studies have identified factors that affect professional competence during the COVID-19 pandemic, direct comparison is difficult. Therefore, further studies are needed. Resilience may serve as a measure of coping ability and could be an important target in the treatment of anxiety, depression and stress reactions [23]. By increasing the resilience of nurses, they can better cope with stress, leading to enhanced professional competence [38]. Therefore, it is necessary to actively develop programs that increase the resilience and professional competence of nurses during the COVID-19 pandemic.

This study participants in this study were not randomly selected, and the analysis was based on self-reported measures of anxiety, resilience, self-efficacy, and professional competence therefore generalization of this study findings may be limited.

5. Conclusion

This study was conducted to examine the COVID-19 related anxiety, self-efficacy, resilience, and professional competence of nurses working in hospitals where COVID-19 patients are hospitalized. Additionally, we attempted to identify factors that affect professional competence. Self-efficacy and resilience affected the professional competence of hospital nurses during the COVID-19 pandemic. Therefore, it is necessary to design hospital-based

programs that can improve the self-efficacy and resilience of nurses, to fully demonstrate their professional competence during the COVID-19 pandemic.

Nurses are exhausted in many ways due to the longer-than-expected COVID-19 pandemic situation. In order to boost nurses' morale and improve nursing work performance, attention at the nursing organization level is needed. Nurses with high self-efficacy continue to strive to effectively cope with their jobs and achieve their goals. In addition, resilience can be steadily improved through external interventions such as learning and training. Therefore, efforts to systematically manage and monitor them at the nursing organizational level are needed.

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Pratibha Bhandari [정회원]

- 2011년 8월 : 이화여자대학교 대학원 간호학과(간호학석사)
- 2014년 8월 : 이화여자대학교 대학원 간호학과 (간호학박사)
- 2015년 3월~2021년 11월 : 우송대학교 간호학과 교수
- 2015년 3월~현재 : Lecturer, University of Technology Sydney, NSW, Australia
- 관심분야 : Non-communicable diseases, Quality of life, Health promotion, m-health
- E-Mail : pratibha.bhandari@health.nsw.gov.au

Jinsook Kim [정회원]

- 2014년 8월 : 연세대학교 간호학과 (간호학석사)
- 2019년 2월 : 연세대학교 대학원간호학과 (간호학박사)
- 2019년 3월~현재 : 우송대학교 간호학과 교수
- 관심분야 : 간호교육, 간호관리, 영적 간호
- E-Mail : somach87@hanmail.net

정 수 경(Su Kyoung Chung) [정회원]

- 1994년 2월 : 연세대학교 간호학과 (간호학석사)
- 2010년 2월 : 연세대학교 대학원간호학과 (간호학박사)
- 2010년 9월~현재 : 우송대학교 간호학과 교수
- 관심분야 : 간호교육, 안전문화, 만성질환관리
- E-Mail : skyoung1@wsu.ac.kr