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Research paper

Disaster nursing competencies of rural nurses during COVID-19: A cross-sectional study

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ABSTRACT

Background: Although rural nurses' roles are indispensable in coronavirus disease 2019 (COVID-19) management, increased roles, workload, burnout, and reduced job satisfaction can hinder their work, potentially affecting nurses' disaster nursing competencies.
Aim: The aim of the study was to identify the predictors of rural nurses' disaster nursing competencies during the COVID-19 pandemic.
Methods: Nurses from rural community hospitals in South Korea (N=204) were surveyed during June–July 2021. We used the Professional Quality of Life and Disaster Nursing Preparedness-Response Competencies questionnaires. Multiple regression analysis was performed to identify the predictors of disaster nursing competencies.
Findings: The mean score for disaster nursing competency of the 204 participants was 110.80 (standard deviation=19.14). Disaster nursing competencies correlated with age, nursing career, compassion satisfaction, and secondary traumatic stress. Compassion satisfaction (β=.27, P=.004), prior disaster nursing education (β=.19, P=.005), and prior participation in disaster nursing care (β=.16, P=.022) predicted disaster nursing competencies, together accounting for 24.2% of the variance.
Discussion: Our findings imply that increasing opportunities for continuing education regarding disaster nursing is crucial to enhance the related competencies in rural nurses. This study also highlights the necessity for stakeholders to develop programs aimed at increasing rural nurses' compassion satisfaction.
Conclusion: Prior disaster nursing education, prior participation in disaster nursing care, and compassion satisfaction predicted disaster nursing competencies among rural nurses, with compassion satisfaction being the strongest predictor.

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Summary of relevance

Problem or issue
As rural communities are more heavily populated by older adults and by people with underlying health conditions, rural nurses play an even more important role during the COVID-19 pandemic. Studies have not sufficiently investigated the disaster nursing competencies of rural nurses, especially in the context of the COVID-19 pandemic.

What is already known
Nursing competencies are affected by a variety of factors, including compassion satisfaction, secondary traumatic stress, and burnout.

What this paper adds
Our findings indicate that increasing opportunities for continuing education concerning disaster nursing is crucial for enhancing related competencies in rural areas. Additionally, stakeholders must develop programs aimed at increasing rural nurses' compassion satisfaction.

1. Introduction

According to a 2020 global report, approximately 40% of the global population resides in rural communities (United Nations Department of Economic and Social Affairs Population Division, 2019). The increasing healthcare costs and poor accessibility to healthcare facilities in rural communities have resulted in a widening health disparity between rural and urban areas (Ross & Crawley, 2019). This cited study also shows that rural residents suffer owing to the considerably lower availability of healthcare providers and specialists compared with what is available to urban residents; it also indicates that nurses in rural communities play a crucial role in narrowing such health disparities. Rural nurses contribute to the growth, development, and cohesion of rural healthcare systems directly and indirectly through multiple professional and social interactions (Scharff, 2021).

While the whole world has been affected by the coronavirus disease 2019 (COVID-19) pandemic declared in March 2020, older populations are the most vulnerable (Choi & Yang, 2021). Furthermore, as rural communities are more heavily populated by older adults (Pender, Hertz, Cromartie, & Farrigan, 2019) and by people with underlying health conditions than urban communities, rural nurses play an even more important role during the COVID-19 pandemic. In fact, the pandemic has led to emotional exhaustion and reduced job satisfaction among rural nurses owing to an array of challenges, including the strengthening of infection control, nursing staff shortages, and poor working conditions (Leskovic, Erjavec, Leskovar, & Vukovič, 2020). Increased roles, workload, burnout, and reduced job satisfaction among rural nurses hinder infection control during the COVID-19 pandemic, and these are anticipated to adversely affect nurses' COVID-19-related competencies. Thus, it is important to pay attention to disaster nursing competencies among rural nurses to protect the related communities from a COVID-19-triggered disaster. The International Council of Nurses (ICN) collaborated with the World Health Organization to develop the ICN Framework of Disaster Nursing Competencies in 2009 (ICN, 2019). These two international institutions proposed 130 nursing competencies across four areas (mitigation/prevention, preparedness, response, and recovery/rehabilitation) and stressed that all nurses must strive to develop these competencies. Version 2.0 of this framework was published 10 years later, proposing eight domains: preparation and planning, communication, incident management systems, safety and security, assessment, intervention, recovery, and law and ethics (ICN, 2019).

2. Literature review

One study has described disaster nursing competencies as being influenced by nurses' age, career, position, and education levels (Jang, Kim, Lee, & Seo, 2021). Others (Jang, Kim, & Lee, 2022; Tzeng et al., 2016) have described nurses' prior disaster experience, knowledge, and training as important predictors of such competencies. However, studies exploring the factors associated with disaster nursing competencies among rural nurses are limited, and no studies have investigated this topic during the COVID-19 pandemic. Considering that we continue to battle the COVID-19 pandemic, we acknowledge the pressing need for in-depth investigations on the aforementioned matters.

Research shows that professional quality of life (ProQOL) may affect clinical competency in nurses and that it is an important construct for healthcare providers and linked to personality traits and environments at the individual level (Durkin, Beaumont, Hollins Martin, & Carson, 2016). Conceptually, it refers to the positive and negative emotions an individual feels about the work as a helper or rescuer, encompassing three dimensions: compassion satisfaction, secondary traumatic stress, and burnout (Stamm, 2009).

Meanwhile, compassion satisfaction, a positive emotional construct, occurs when nurses utilise altruistic empathy to alleviate patient suffering (Sacco & Copel, 2018). A study by Zakeri et al. (2021) shows that compassion satisfaction can reduce secondary traumatic stress and burnout, the two other predictors of nurses' clinical competence. Compassion satisfaction was also shown to be a strong predictor of disaster nursing competencies among South Korean mental health nurses.

Rural nurses are highly likely to develop secondary traumatic stress and burnout owing to the features of rural communities and hospitals (Smith, 2017). Smith (2017) demonstrates that the symptoms related to secondary traumatic stress and burnout in this population include generalised pain, depression, and isolation, which are triggered by problems, such as the lack of resources, support services, and leadership support. Compared with their urban counterparts, rural nurses are more likely to encounter patients who die from environment-related causes, and mortality rates in remote rural areas are higher than those in urban areas (Fahs & Rouhana, 2020). Nurse shortage and diminished healthcare resources in hospitals and the lack of social support and isolation in the living environments are other issues that attest to the poor working environments of nurses in remote rural areas (Smith, Halcomb, Sim, & Lapkin, 2021). Further, rural nurses are hospital staff and members of a tight-knit rural community; therefore, they are likely to be in dual relationships with their patients because they may be acquainted with them directly or indirectly (Scharff, 2021). Such work environments can trigger secondary traumatic stress and burnout in rural nurses (Jahner, Penz, & Stewart, 2019).

As aforementioned, compassion satisfaction, secondary traumatic stress, and burnout can have a notable impact on and be predictors of disaster nursing competencies in rural nurses during the COVID-19 pandemic. However, there are few studies which have analysed the relationship between the disaster nursing competencies of rural nurses and their quality of life or that have examined such competencies in this population, especially during the COVID-19 pandemic. Accordingly, this study aimed to examine disaster nursing competencies levels during the COVID-19 pandemic and to determine whether the three components of ProQOL predict such competencies among rural nurses.

3. Participants, ethics, and methods

3.1. Study design

A cross-sectional design was utilised.

3.2. Participants and data collection

The sample size was calculated using G Power, version 3.1.9.2. Considering 12 predictors, a significance level of .05, power of .95, and a medium effect size (f^2) of 0.15, the minimum sample size required for multiple regression analysis was 184. The inclusion criteria were nurses (i) working for at least six months in community hospitals in rural areas of South Korea, that is, excluding metropolitan and other developed cities, (ii) understanding the purpose of this study, and (iii) agreeing to participate voluntarily. Considering a 10% dropout rate (Hoerger, 2010), 204 was set as the target sample size. An online survey was conducted from June to July 2021 and the response rate was 100%. A total of 204 nurses voluntarily participated in this study.

3.3. Measures

3.3.1. Demographic and work-related characteristics

A questionnaire survey was administered to collect respondents' demographic characteristics in accordance with a previous study (Jang et al., 2022) on nurses' disaster competencies during the COVID-19 pandemic.

3.3.2. Professional quality of life

We used the Korean version of the ProQOL Version 5 (Stamm, 2009), which has the three independent subscales of compassion satisfaction, secondary traumatic stress, and burnout, with ten items each (score range: 10–50). Items are rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), with higher scores indicating a greater level of the corresponding construct. Scores are classified as low (below 23), moderate (23–41), and high (above 42), and higher scores indicate higher compassion satisfaction, secondary traumatic stress, and burnout (Stamm, 2009). In the original study (Stamm, 2009), the Cronbach's α ranged from .75 to .88; in this study, it ranged from .73 to .90.

3.3.3. Disaster nursing competencies

The Disaster Nursing Preparedness-Response Competencies was adapted to the Korean language (Ahn, Jang, & Kim, 2017) based on the ICN Framework of Disaster Nursing Competencies, and we used it to measure rural nurses' disaster nursing competencies. This 34-item scale has two subscales: disaster nursing preparedness competence and disaster nursing response competence. All items are rated on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree), with higher scores indicating greater competency. In the original study, the Cronbach's α was .96 consistently (Ahn et al., 2017); in this study, it ranged from .93 to .95.

3.4. Data analyses

IBM SPSS Statistics software (Version 26.0) was used for data analysis. Participants' demographic characteristics, disaster nursing-related characteristics, and ProQOL were analysed using descriptive statistics. The differences in disaster nursing competencies by demographic and disaster nursing-related characteristics were analysed using t'test and one-way analysis of variance. The Scheffé's method was used for post-hoc tests. Correlations among major study variables were analysed using Pearson's correlation coefficients. Multiple regression analysis was performed using the Enter method (Kim, Mallory, & Valerio, 2022) to examine the effects of the ProQOL of rural nurses on their disaster nursing competencies and to identify other predictors of disaster nursing competencies. The normality and homoscedasticity of the residuals were tested using the Kolmogorov-Smirnov and Breusch-Pagan tests, respectively. Statistical significance was set at a two-sided *P*-value of .05.

Table 1
Participants' demographic and disaster nursing-related characteristics (N=204).

Characteristics	Categories	n (%)	M±SD
Age (years)	<30	48 (23.5)	37.79 ±
	30–40	61 (29.9)	8.90
	40–50	75 (36.8)	
	>50	20 (9.8)	
Sex	Male	15 (7.4)	
	Female	189 (92.6)	
Marital status	Single	81 (39.7)	
	Married	123 (60.3)	
Religion	No	102 (50.0)	
	Yes	102 (50.0)	
Education	3-year college	62 (30.4)	
	University	142 (69.6)	
Hospital setting	<300 beds	113 (55.4)	
	>300 beds	91 (44.6)	
Position	Staff	150 (73.5)	
	Manager	54 (26.5)	
Nursing career (years)	<5	42 (20.6)	12.59 ±
	5–10	50 (24.5)	8.03
	10–15	31 (15.2)	
	>15	81 (39.7)	
Participation in COVID-19 nursing care	No	166 (81.4)	
	Yes	38 (18.6)	
Prior disaster nursing education	No	116 (56.9)	
	Yes	88 (43.1)	
Prior participation in disaster nursing care	No	171 (83.8)	
	Yes	33 (16.2)	

M, mean; SD, standard deviation.

3.5. Ethical considerations

This study was conducted after obtaining approval from the Institutional Review Board of the university to which the authors are affiliated. We posted a survey link for nurses on social media which contained an explanation of this study, and potential participants were required to provide electronic informed consent before proceeding. The online survey also disclosed for participants that they had the freedom to withdraw from the study at any time. We made sure that this paper adheres to the Strengthening the Reporting of Observational Studies in Epidemiology guidelines for cross-sectional research.

4. Results

4.1. Demographic and work-related characteristics

In total, valid data from 204 participants were analysed. The mean age was 37.79 (standard deviation=8.90) years. The majority were women (92.6%); married (60.3%); and subscribed to a religion (50.0%). Most participants had a Bachelor of Science in Nursing (69.6%) and a total nursing career of ≥10 years (54.9%); most (73.5%) were staff nurses; 18.6% had previously participated in COVID-19 care; 43.1% had prior disaster nursing education; and 16.2% directly participated in disaster nursing (Table 1).

4.2. Professional quality of life and disaster nursing competency scores

The participants showed moderate levels of compassion satisfaction, secondary traumatic stress, and burnout. The mean score for disaster nursing competency was 110.80 (standard deviation=19.14) (Table 2).

Table 2
Scores for professional quality of life and disaster nursing competency in rural nurses (N=204).

Variables	Subscales	Total scores M±SD
Professional quality of life	Compassion satisfaction	33.84±5.95
	Secondary traumatic stress	26.88±4.81
	Burnout	25.48±5.02
Disaster nursing competencies		110.80±19.14

M, mean; SD, standard deviation.

Table 3
Disaster nursing competency by participants' characteristics (N=204).

Characteristics	Categories	M±SD	t/F (p)	Scheffé test
Age (years)	<30 (a)	105.19±20.11	5.10 (.002)	(d)>(a), (b), (c)
	30–40 (b)	108.28±16.84		
	40–50 (c)	113.21±19.88		
	>50 (d)	122.95±14.17		
Sex	Male	111.73±30.74	0.20 (.846)	
	Female	110.73±18.03		
Marital status	Single	105.54±19.97	3.26 (.001)	
	Married	114.27±17.82		
Religion	No	110.39±19.53	0.31 (.759)	
	Yes	111.22±18.84		
Education	3-year college	113.10±20.81	1.13 (.259)	
	University	109.80±18.35		
Hospital setting	<300 beds	111.07±19.03	0.22 (.825)	
	≥300 beds	110.47±19.40		
Position	Staff	108.97±18.77	2.30 (.022)	
	Manager	115.89±19.42		
Nursing career (years)	<5 (a)	101.86±17.78	4.73 (.003)	(d)>(a)
	5–10 (b)	111.10±19.66		
	10–15 (c)	111.00±17.21		
	>15 (d)	115.19±18.93		
Participation in COVID-19 nursing care	No	109.52±19.29	2.02 (.045)	
	Yes	116.42±17.63		
Prior disaster nursing education	No	105.89±16.17	4.40 (<.001)	
	Yes	117.28±20.85		
Prior participation in disaster nursing care	No	108.36±17.73	4.32 (<.001)	
	Yes	123.45±21.37		

M, mean; SD, standard deviation.

4.3. Disaster nursing competencies by participants' characteristics

Disaster nursing competencies significantly differed by age, marital status, job position, nursing career, participation in COVID-19 nursing care, prior disaster nursing education, and prior participation in disaster nursing care. Disaster nursing competencies were higher among those who were aged ≥50 years, were married, held a managerial or higher position, had been working for ≥15 years, had prior disaster nursing education, and participated in COVID-19 nursing and disaster nursing (Table 3).

4.4. Correlations among variables

Age and nursing career were positively correlated with compassion satisfaction and disaster nursing competencies. Compassion satisfaction was negatively correlated with secondary traumatic stress, but not significantly correlated with burnout. Meanwhile, disaster nursing competencies were positively correlated with compassion satisfaction and negatively correlated with secondary traumatic stress, but not significantly correlated with burnout (Table 4).

4.5. Predictors of disaster nursing competencies among rural nurses

A multiple regression analysis was performed using the Enter method. The significant variables identified when examining the difference in disaster nursing competencies according to participants' characteristics or correlated with disaster nursing competencies were used as independent variables. The variance inflation factor was in the range of 1.15–2.63, confirming the absence of multicollinearity among the independent variables. The Durbin-Watson statistic was 1.95, confirming the absence of autocorrelation in the dependent variable. The Kolmogorov-Smirnov test confirmed a normal distribution of data, and the Breusch-Pagan test confirmed homoscedasticity. The strongest predictor of disaster nursing competencies was compassion satisfaction (β=.27, P=.004), followed by prior disaster nursing education (β=.19, P=.005) and prior participation in disaster nursing care (β=.16, P=.022). These three variables accounted for 24.2% of the variance in rural nurses' disaster nursing competencies (Table 5).

5. Discussion

In this study, rural nurses with prior disaster nursing education showed higher disaster nursing competencies than their counterparts without prior education. These results are consistent with the findings of Jang et al. (2022) on mental health nurses in large cities; those of Labrague, Yboa, McEnroe-Petitte, Lobrino, and Brennan (2016) on nurses' disaster preparedness competency; and those of Jang et al. (2021), which showed that disaster-related training and education predict disaster response readiness in emergency nurses. Hutton, Veenema, and Gebbie (2016) further suggested that improving nurses' disaster nursing competencies is essential to promote advances in disaster nursing practice. Hutton et al. (2016) also described the need for implementing education on adherence to the ICN Framework of Disaster Nursing Competencies and on the related areas of interest at both the national and global levels. Our results generally corroborate these statements.

Discussing the result of the current study on higher disaster nursing competencies among rural nurses with prior education on the related field, prior research shows that, conventionally, the nursing staff pool tends to be smaller in rural than in urban areas, and the same often occurs regarding the difficulty to attract and to retain nurses (Fahs, 2021). Further, efforts to recruit and to retain newly graduated nurses in rural areas have generally emphasised nursing managerial support and situational learning as advantages (Lea & Cruickshank, 2017). Prior research also describes that tailored disaster-related education that reflects the core competencies in Version 2.0 of the ICN Framework may be particularly important

Table 4
Correlations among major variables (N=204).

		Age	Nursing career	ProQoL			Disaster nursing competencies
				CS	STS	BO	
		r (p)	r (p)	r (p)	r (p)	r (p)	r (p)
Age		1					
Nursing career		.87 (<.001)	1				
ProQOL	CS	.23 (.001)	.16 (.019)	1			
	STS	-.17 (.018)	-.08 (.249)	-.63(<.001)	1		
	BO	.20 (.071)	.10 (.145)	.10 (.162)	.39 (<.001)	1	
Disaster nursing competencies		.26 (<.001)	.25 (<.001)	.37 (<.001)	-.19 (.006)	.12 (.081)	1

BO, burnout; CS, compassion satisfaction; ProQOL, professional quality of life; STS, secondary traumatic stress.

Table 5
Results of the analysis to identify the predictors of disaster nursing competencies in South Korean rural nurses (N=204).

Variable	Disaster nursing competencies						95% CI	
	B	SE	β	t	*P*	VIF	Lower	Upper
(Constant)	73.43	16.32		4.50	<.001		41.26	105.61
Marital status (single)[a]	2.66	2.92	0.07	0.91	.363	1.50	-3.10	8.42
Nursing career	0.34	0.22	0.14	1.53	.129	2.37	-0.10	0.78
Position (staff)[a]	-1.31	3.62	0.03	0.36	.718	1.87	-8.45	5.83
Participation in COVID-19 nursing care (none)[a]	3.94	3.24	0.08	1.22	.226	1.17	-10.34	2.46
Prior disaster nursing education (none)[a]	7.21	2.52	0.19	2.86	.005	1.15	2.23	12.19
Prior participation in disaster nursing care (none)[a]	8.30	3.59	0.16	2.31	.022	1.29	1.22	15.38
Compassion satisfaction	0.87	0.30	0.27	2.93	.004	2.31	0.29	1.46
Secondary traumatic stress	-0.17	0.39	0.04	0.43	.669	2.63	-0.95	0.61
Burnout	0.22	0.29	0.06	0.74	.460	1.58	-0.36	0.79
	Adjusted R^2=.242, F=8.20 (*P*<.001)							

Durbin-Watson's d=1.95 (du=1.86, 4-du=2.14); Breusch-Pagan test (χ^2=12.75, *P*=.175); Kolmogorov–Smirnov test (Z=.07, *P*=.319).
CI, confidence interval; SE, standard error; VIF, variance inflation factor.
[a] Dummy variable (reference).

to improve rural nurses' disaster nursing competencies (Mao et al., 2021). Ohta, Matsuzaki, and Itamochi (2020) further stressed the significance of providing continuing education for rural nurses to help them gain a comprehensive understanding of COVID-19 and to overcome the problems brought upon by it. In a recent study, Reece et al. (2021) provided virtually facilitated simulation-based education for a range of healthcare providers (e.g., physicians, respiratory therapists, and nurses) in an attempt to improve COVID-19-related disaster response competencies in rural and remote areas; the education was highly effective in improving clinical and crisis resource management. Patel et al. (2021) reported that appropriate clinical education and specialist consultation are needed for frontline nurses in rural areas who provide COVID-19 care as they experience moral distress and scarcity of resources. In light of the ethical aspects in the Core Competencies of Disaster Nursing Version 2.0 (ICN, 2019) document and our results, it may indeed be that educational measures such as the ones demonstrated in the cited studies above can strengthen nurses' disaster response competencies.

Furthermore, prior participation in disaster nursing care was a predictor of rural nurses' disaster nursing competencies in our sample. On this topic, the literature shows that nurses who participated in disaster nursing demonstrated higher confidence levels in emergency nursing (Tzeng et al., 2016) and higher disaster nursing competencies (Jang et al., 2022; Labrague et al., 2016) than those without such experience. Moreover, nurses with rich clinical experience are more willing to participate in disaster nursing (Sonneborn, Miller, Head, & Cross, 2018). The results of this study reaffirmed that nurses' participation in disaster nursing care can play a crucial role in improving their disaster nursing competencies.

The literature shows that there is an incorrect bias that infectious diseases, such as COVID-19, are less likely to spread through rural areas compared with urban areas (Fahs, 2021). Since rural areas can suffer more serious damage from health-related problems owing to their less resourced healthcare delivery system (Fahs & Rouhana, 2020), and rural nurses are pivotal to the correct functioning of these systems, it is easy to rationalise how the improvement of their disaster nursing competencies is crucial for healthcare delivery in rural and remote areas.

Meanwhile, our results showed that compassion satisfaction, a positive component of ProQOL, was the strongest predictor of disaster nursing competencies. Jang et al. (2022) showed similar results when examining the effects of ProQOL on disaster nursing competencies during the COVID-19 pandemic among nurses from the same culture. According to Trumello et al. (2020), nurses caring for COVID-19 patients demonstrated lower compassion satisfaction than those who did not participate in COVID-19 care. During the COVID-19 pandemic, most nurses experienced and may continue to experience psychological distress and various other mental health problems, such as anxiety, depression, stress, and post-traumatic stress syndrome symptoms (Roberts et al., 2021). Indeed, in another study conducted amid the COVID-19 pandemic, the prevalence of depression and anxiety was shown to be two to three-fold higher among rural nurses than urban nurses, and most rural nurses experienced emotional exhaustion (Roberts et al., 2021). During difficult times, compassion satisfaction can become a source of strength that motivates nurses to continue working despite the dangerous work environment, critical patient status, and high stress (Durkin et al., 2016). It is also considered a protective factor against adverse outcomes, such as burnout (Zakeri et al., 2021). Therefore, interventions to enhance rural nurses' compassion satisfaction in the context of the COVID-19 pandemic are warranted; their development could be informed by recent intervention studies that aimed to boost nurses' compassion satisfaction. For example, Semerci et al. (2021) conducted progressive muscle relaxation exercises with nurses to boost effectiveness.

Nursing managers must provide tailored disaster nursing education, such as virtually facilitated simulation-based education, that considers nurses' context and needs to promote disaster nursing competencies in rural nurses. Moreover, health policymakers should devise measures to encourage rural nurses to participate directly and indirectly in disaster nursing. Above all, interventions that foster compassion satisfaction, such as mindfulness (Slatyer et al., 2018), daily meditation (Bonamer et al., 2019), and group support sessions (Hu, 2017), are needed and may be pivotal in improving rural nurses' disaster nursing competencies.

Some study limitations must be considered. First, this study was limited to a single geographic area; therefore, the findings have narrowed generalisability. Second, this study used a cross-sectional design; therefore, causality among the variables could not be established. To address these limitations and enhance our comprehension on the predictors of disaster nursing competencies in rural nurses, future studies should perform randomised sampling, recruit participants from various countries, and use longitudinal designs.

6. Conclusions

Prior disaster nursing education, prior participation in disaster nursing care, and compassion satisfaction were identified as predictors of disaster nursing competencies in rural nurses, with compassion satisfaction being the strongest predictor. Our findings imply that increasing opportunities for continuing education regarding disaster nursing (e.g., virtual disaster nursing simulation) is crucial to enhance the related competencies in rural nurses. This study also highlights the necessity for stakeholders to develop programs aimed at increasing rural nurses' compassion satisfaction.

Even during times of disaster, for maintaining nurses' lifestyle balance and improving their disaster nursing competencies, psychosocial interventions, such as meditation and psychological support, should be considered.

Authorship contribution statement

S.J.J. and S.C.: Conceptualisation, methodology, formal analysis, investigation, resources, writing-original draft preparation, writing—review and editing. S.C.: Funding acquisition. All authors have read and agreed to the published version of the manuscript.

Ethical statement

This study was conducted after obtaining approval from the Institutional Review Board of the Chung-Ang University (approval number: 1041078-202104-HRSB-098-01; date: 06.15.2021).

Data statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Conflict of interest

None.

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