Association between Resilience, Professional Quality of Life, and Caring Behavior in Oncology Nurses: A Cross-Sectional Study

Jeon, Misun[1] · Kim, Sue[2] · Kim, Sanghee[2,3]

[1]College of Nursing and Brain Korea 21 FOUR Project, Yonsei University, Seoul
[2]College of Nursing and Mo-Im Kim Nursing Research Institute, Yonsei University, Seoul
[3]Department of Artificial Intelligence, College of Computing, Yonsei University, Seoul, Korea

Purpose: The degree of caring behavior of oncology nurses is a crucial factor in the care provided to patients with cancer. In this study, we aimed to investigate factors related to oncology nurses' caring behavior, including their resilience and professional quality of life. **Methods:** A cross-sectional descriptive study was conducted with 107 oncology nurses at an urban tertiary hospital from May 18 to 24, 2015. We used a self-report questionnaire to measure resilience, professional quality of life, and degree of caring behavior. Data analysis included descriptive statistics, correlations, and multiple regression analysis using SPSS/WIN 20.0. **Results:** Oncology nurses presented with low levels of resilience and caring behavior, and high levels of compassion satisfaction, burnout, and secondary traumatic stress. There was a statistically significant relationship between the degree of caring behavior, resilience ($r = .43, p < .001$), compassion satisfaction ($r = .51, p < .001$), and burnout ($r = -.42, p < .001$), as well as between secondary traumatic stress and burnout ($r = .34, p < .001$). Factors associated with oncology nurses' degree of caring behavior were compassion satisfaction ($t = 6.00, p < .001$) and educational level ($t = 3.45, p = .001$). **Conclusion:** This study demonstrates that oncology nurses' degree of caring behavior is related to their professional quality of life and education. These findings suggest that enhancing oncology nurses' healthy coping strategies at both the individual and organizational levels can further develop holistic nursing care. Additionally, it is necessary to examine the factors affecting nurses' compassion satisfaction and to try to promote this aspect.

Key words: Oncology Nursing; Resilience, Psychological; Quality of Life; Nursing Care; Burnout, Professional

INTRODUCTION

People with cancer undergo a multifaceted treatment journey, which includes diagnosis, surgery, chemotherapy, and radiation therapy, and is often accompanied by various side effects. Oncology nurses play a pivotal role in the cancer care continuum. As patient navigators, they are integral to providing patient-centered, integrated care and facilitating effective communication [1]. In this process, oncology nurses frequently face challenging circumstances, such as patients' pain, medical constraints, and family distress. These professionals experience unique emotional burdens, including fear of death, guilt, and emotional weight while attending to patients. These challenges, combined with the distinct characteristics of oncology nursing, contribute to increased job stress and burnout and reduced job satisfaction [2-4]. Unfortunately, the resultant burnout, compassion fatigue, increased job stress, and diminished job satisfaction among oncology nurses can adversely influence their ability to provide quality patient care [5].

However, the relationship between work-related stress and job satisfaction in oncology nurses varies among individuals and is influenced by factors such as resilience. Resilience, defined as the ability to adapt positively to external adversities, plays a critical role in coping with stress [6]. Highly resilient nurses overcome impossibilities by actively using internal and external resources [7]. Several studies have reported that higher resilience leads to a better sense of well-being, lower burnout [8-10], and higher job satisfaction [4]. High resilience positively affects job performance [11]. Therefore, it is expected that high resilience could be one of the factors contributing to individual differences in the response to challenging clinical situations faced by oncology nurses.

Professional quality of life is an indicator used to measure nurses' job satisfaction [12]. This indicator is relevant to all healthcare providers who help individuals experiencing trauma and suffering. Professional quality of life has three main aspects: compassion satisfaction, burnout, and secondary traumatic stress [12]. In previous studies, oncology nurses experienced high levels of burnout [2] and secondary traumatic stress [13], and reported low compassion satisfaction [4]. Low professional quality of life affects nurses' intentions to leave [4] and ultimately negatively affects the quality of patient care [14]. A significant relationship is expected between the level of resilience and professional quality of life, including burnout and compassion satisfaction. Much research has been conducted on the relationship between resilience and job stress in oncology nurses [15-17].

However, a review of the literature reveals a challenge in definitively establishing the correlation between resilience and professional quality of life, as well as the relationship between caring behavior, resilience, and professional quality of life. Previous research has primarily focused on the influence of resilience on job stress, with limited insight into their combined impact on nurses' caring behavior [2,4,15-17]. Furthermore, despite its pivotal role in caring for patients with cancer, there is a dearth of research on the factors shaping caring behavior, specifically within the context of oncology nursing [14]. Consequently, it is imperative to unravel the intricate interplay between resilience, professional

quality of life, and caring behavior within the realm of oncology nursing. This impetus is underscored by the necessity to comprehensively illuminate the distinctive attributes inherent in oncology nurses and expound upon the compelling rationale that underscores the pivotal significance of caring within this specialized domain.

In this study, we explored the factors associated with oncology nurses' degree of caring behavior, which can further improve the quality of care they provide to patients with cancer. We examined oncology nurses' resilience, professional quality of life, and degree of caring behavior to provide interventions necessary to improve care. Specifically, we aimed to (1) assess nurses' resilience, professional quality of life, and degree of caring behavior; (2) analyze the differences in levels of resilience, professional quality of life, and degree of caring behavior based on general characteristics; (3) identify the relationship between resilience, professional quality of life, and degree of caring behavior; and (4) identify the factors associated with the degree of caring behavior of oncology nurses.

METHODS

1. Study design

This is a cross-sectional descriptive correlational study.

1) Setting and sample

The participants were nurses caring for patients with cancer at an urban tertiary hospital in South Korea. The study population included nurses (including charge and staff nurses) who had worked for at least three months at the end of their probationary period in cancer patient care units in oncology wards, outpatient chemotherapy treatment centers, and hematopoietic stem cell transplant units. Instances where the nurses cared for patients with cancer but the ward was not an oncology ward were excluded, such as in the intensive care unit or emergency room.

Based on the literature, the G∗Power 3.1 program was used to estimate the sample size, with the significance level set at .05, a power of .80, an effect size of .15, a median effect size of regression, and six independent variables (resil-

ience, the three subdomains of professional quality of life—compassion satisfaction, burnout, and secondary traumatic stress—education, and job satisfaction). This resulted in a minimum sample size of 98. Considering a dropout rate of 12.0% [18], the target sample size was 118 nurses. The questionnaire was distributed to 118 nurses, with 111 responses (response rate 96.5%) collected and 107 used in the final analysis after excluding four incomplete responses.

2) Measurements

(1) Demographic characteristics

Demographic characteristics collected personal information such as age, marital status, education, religion, clinical experience, clinical experience in cancer nursing, current work location, educational experience in cancer nursing, ability to request day off, family or friend's experience with cancer, presence of supporters or counselors, and overall job satisfaction. Overall job satisfaction was measured by a single commonly used question, modified by the researchers, "Overall, how satisfied are you with your current job as a nurse?" and rated on a 0~10 scale, with 0 being "extremely dissatisfied", 5 being "moderate", and 10 being "extremely satisfied".

(2) Resilience

We used the validated Korean version of the Connor-Davidson Resilience Scale [19,20] to measure resilience among oncology nurses. This tool consists of 25 questions across five subdomains—toughness, perseverance, optimism, support, and spirituality—measured on a 5-point Likert scale (0 = not at all, 4 = very often). The total score ranges from 0 to 100. Higher scores indicate higher levels of resilience. Regarding the reliability of the tool, Cronbach's α was .91 in Baek's study [20] and .92 in the present study.

(3) Professional quality of life

The Professional Quality of Life Scale: Compassion Satisfaction and Compassion Fatigue Version 5 [12] consists of 30 questions. There are 10 questions for each of the three subdomains—compassion satisfaction, burnout, and secondary traumatic stress—rated on a 5-point Likert scale ranging from 1 (not at all) to 5 (very often). The interpretation of the results based on the subdomain scores is as follows: higher compassion satisfaction scores indicate higher levels of satisfaction related to one's ability to be an effective caregiver in one's job. A higher score for burnout indicates a higher risk of burnout, and a higher score for secondary traumatic stress indicates a higher likelihood of secondary exposure to work-related extreme or traumatic stress. The total score for each sub-factor is independently evaluated without using the total score of the 30 questions, for a possible range of scores between 10 and 50. Additionally, to determine the high-risk group for low professional quality of life, the total score for each sub-factor is standardized with a z-score of 50 and a variance of 10, and the standardized score is compared with the average of the population. A percentile range of 75% or above is categorized as high, 25%~75% as moderate, and 25% or less as low [12]. Regarding the reliability of the tool, Cronbach's α in Stamm's study [12] was .88 for compassion satisfaction, .75 for burnout, and .81 for secondary traumatic stress. In this study, Cronbach's α was .91 for compassion satisfaction, .78 for burnout, and .75 for secondary traumatic stress.

(4) Caring behavior

The Care Factor Survey-Care Provider Version [21], translated and discussed by a bilingual expert using the committee method [22], was used. We used this tool to measure the degree of caring behavior, which includes humanistic practice, faith in decision-making, instilling faith and hope, learning and teaching, spiritual beliefs and practices, holistic care, helping and trusting relationships, creating a therapeutic environment, promoting emotional expression, and accepting miracles. Each of these 10 perception factors for caring consists of two questions measured on a 7-point Likert scale ranging from 1 (disagree) to 7 (strongly agree). The total score ranges from 20 to 140; the higher the score, the higher the level of care. Regarding reliability, Cronbach's α was .92 in Nelson's study [21] and .94 in the present study.

3) Data collection

Data were collected from May 18 to 24, 2015. The participants were oncology nurses who received information about the study through poster advertisements in the patient care unit and information brochures distributed to their work mailboxes. Interested nurses were interviewed to ensure their understanding of the study and its anticipated benefits and risks. Participants were informed that if they wanted to stop during the survey, they could do so at any time. Those who read the explanation and agreed to participate completed a self-report questionnaire.

We used a structured self-report questionnaire consisting of 89 questions: 25 items on resilience, 30 on professional quality of life, 20 on degree of caring behavior, and 14 on general characteristics, with the approval of the original authors and translators. The time required to complete the questionnaire was 20 minutes.

4) Data analysis

The collected data were analyzed using SPSS/WIN 20.0 (IBM Co., Armonk, NY, USA). Using an independent t-test, one-way ANOVA, and Scheffé's post-hoc test, we analyzed the differences in resilience, professional quality of life, and degree of caring behavior according to nurses' general characteristics. We then calculated Pearson's correlation coefficients to investigate the relationship between nurses' resilience, professional quality of life, and degree of caring behavior. Finally, stepwise regression was performed to identify the factors associated with the nurses' degree of caring behavior.

2. Ethical considerations

Prior to the study, approval was obtained from the Korea University Guro Hospital Institutional Review Board (IRB NO: KUGH15023), and all study procedures were in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants.

RESULTS

1. Participants' general characteristics and scoring of resilience, professional quality of life, and caring behavior

All participants were women, with an average age of 28.79 ± 5.53 years. Among them, 48.6% were below 27 years of age and 24.3% were married. Among all participants, 53.3% had graduated from a four-year university course, 36.4% reported religiosity, and 95.3% indicated having someone to advise or help them. Of the sample, 48.6% did not have people with cancer among their family members and acquaintances. Clinically, most experienced nurses had seven years or more of experience (36.4%), while the average clinical experience was 6.31 ± 5.67 years. The most clinical experience related to patients with cancer was over seven years (29.0%), with an average of 4.96 ± 4.54 years. Furthermore, 56.1% were more than charge nurses. Regarding their working department, the general medicine-surgical ward was common (82.2%), and 78.5% worked on a rotating shift schedule. With regard to job satisfaction, 47.7% reported the highest level, with 4~6 points in the moderate and an average of 5.84 ± 1.78 points out of 10 points, and 59.8% of them were able to adjust their work schedule to fit their preferred hours. Those who answered that they had received education on cancer accounted for 69.2%. Forty-five of the 74 respondents recorded the educational content they received in a narrative form. The educational content of information on cancer treatment and hospital hospice registration procedures accounted for 84.4%, and 15.6% was education for improving the quality of life of patients with cancer (not shown in Table 1). Detailed information on the participants' general characteristics is presented in Table 1.

Table 2 shows the participants' scores for resilience, professional quality of life, and caring behavior. The nurses' total resilience was 57.81 ± 11.49 out of 100 points, and the average score was 2.31 ± 0.46 out of 4 points. Nurses' compassion satisfaction as a subdomain of professional quality of life (average score of 3.36 ± 0.50 points/5 points) and degree of caring behavior (average score 4.76 ± 0.67 points/7 points)

Table 1. General Characteristics of the Participants   (N = 107)

Characteristics	Categories	n (%)	M ± SD
Age (yr)	< 27	52 (48.6)	28.79 ± 5.53
	27~34	42 (39.3)	
	≥ 35	18 (12.1)	
Marital status	Never married	81 (75.7)	
	Married	26 (24.3)	
Education	Diploma	37 (34.6)	
	BSN	57 (53.3)	
	Graduate school and higher	13 (12.1)	
Religion	Christian	26 (24.3)	
	Catholic	5 (4.7)	
	Buddhist	8 (7.5)	
	No religion	68 (63.6)	
Clinical experience (yr)	< 1	19 (17.8)	6.31 ± 5.67
	1~< 3	18 (16.8)	
	3~< 7	31 (29.0)	
	≥ 7	39 (36.4)	
Clinical experience with cancer nursing (yr)	< 1	26 (24.3)	4.96 ± 4.54
	1~< 3	23 (21.5)	
	3~< 7	27 (25.2)	
	≥ 7	31 (29.0)	
Shifts	Rotating shift schedule	84 (78.5)	
	Fixed shift schedule	23 (21.5)	
Clinical position	Staff nurse	47 (43.9)	
	Charge/head nurse	60 (56.1)	
Workplace	General medicine-surgical ward	88 (82.2)	
	Outpatient clinic/floating	19 (17.8)	
Education related to cancer nursing	Yes	74 (69.2)	
	No	33 (30.8)	
Can take a day off at any time	Yes	64 (59.8)	
	No	43 (40.2)	
Cancer experience with family or friends	Family	37 (34.6)	
	Friends	18 (16.8)	
	None	52 (48.6)	
Having a supporter or counsellor nearby	Yes	102 (95.3)	
	No	5 (4.7)	
Job satisfaction	0~3 (low)	9 (8.4)	5.84 ± 1.78
	4~6 (moderate)	51 (47.7)	
	7~10 (high)	47 (43.9)	

BSN = Bachelor of science in nursing; Charge nurse = Official position; M = Mean; SD = Standard deviation.

was higher than the midpoint.

According to the group analysis of professional quality of life, the median group showed the highest compassion satisfaction, burnout, and secondary traumatic stress at 43.0%, 45.8%, and 60.7%, respectively. Furthermore, 75.7% of the nurses indicated moderate or higher levels of burnout, 83.1% indicated moderate or higher secondary traumatic stress, and 26.2% indicated high compassion satisfaction. Additionally, in examining the transformed z-values, we found that 5.6% of the participants were at high risk for low professional quality of life. The high-risk group for low professional quality of life had lower mean scores for resilience

Table 2. Score of Resilience, Professional Quality of Life, and Caring Behavior (N = 107)

Variables	Number of items	Min	Max	M ± SD
Resilience	25	31	83	57.81 ± 11.49
Professional quality of life				
Compassion satisfaction	10	16	45	33.58 ± 5.66
Burnout	10	16	41	28.03 ± 4.95
Secondary traumatic stress	10	15	42	27.51 ± 4.40
Caring behavior	20	65	135	95.20 ± 13.39

Min = Minimum; Max = Maximum; M = Mean; SD = Standard deviation.

(42.83 ± 7.14) and degree of caring behavior (87.67 ± 11.34) than the entire sample. The mean age, total clinical experience, and clinical experience with patients with cancer in the high-risk group for poor professional quality of life were 26.17 ± 2.79 years (range: 23~30), 4.61 ± 2.22 years (range: 2~8), and 4.14 ± 2.48 years (range: 1~8), respectively (not shown in Table 2).

2. Differences in resilience, professional quality of life, and caring behavior

Nurses aged over 35 years demonstrated higher levels of resilience (F = 4.26, p = .017) and higher degrees of caring behavior (F = 6.79, p = .002) than nurses aged 34 years or younger. Additionally, compared to nurses aged younger than 27 years, those aged 35 years and older reported lower levels of burnout (F = 5.42, p = .006). Married nurses showed higher levels of resilience (t = −3.01, p = .003), compassion satisfaction (t = −2.27, p = .025), and degrees of caring behavior (t = −2.26, p = .026) than unmarried nurses. They also had lower levels of burnout (t = 4.43, p < .001). When job satisfaction was higher, nurses' resilience (F = 43.40, p < .001), compassion satisfaction (F = 75.18, p < .001), and degree of caring behavior (F = 17.39, p < .001) were significantly higher. Higher job satisfaction was associated with lower levels of burnout (F = 45.18, p < .001). When nurses had others to consult, they had higher compassion satisfaction (t = 3.10, p = .002) and lower burnout (t = −2.35, p = .021). Burnout was higher for those with total clinical experience between one and three years than for those with seven years or more (F = 3.45, p = .019) and among staff

nurses than charge and head nurses (t = 2.15, p = .034). Secondary traumatic stress was higher among those working a rotating shift schedule than among those working on a fixed shift schedule (t = 2.25, p = .026) and among those working in wards as opposed to outpatient clinics (t = 2.52, p = .013). The degree of caring behavior of the charge and head nurses was higher than that of the staff nurses (t = −2.09, p = .039). Furthermore, nurses who had a supporter or counselor with them reported higher compassion satisfaction (t = 3.10, p = .002) and lower burnout (t = −2.35, p = .021). Additionally, the degree of caring behavior was significantly higher among nurses enrolled in graduate school or higher than among those who graduated from vocational college or a four-year university course (F = 6.34, p = .003). Table 3 provides more detailed information on the differences between the variables.

3. Correlations between resilience, professional quality of life, and caring behavior

Pearson's correlation coefficients were calculated to analyze the correlations between resilience, professional quality of life, and degree of caring behavior (Table 4). Among the subdomains of professional quality of life, resilience had a significantly strong correlation with compassion satisfaction (r = .80, p < .001), indicating that the higher the resilience, the higher the compassion satisfaction. In addition, between resilience and the subdomains of professional quality of life, burnout (r = − .68, p < .001) showed a significant inverse correlation of relatively high strength, indicating that burnout decreased as resilience increased. Among the professional quality of life subdomains, compassion satisfaction showed a significant inverse correlation with burnout (r = − .70, p < .001). As compassion satisfaction increased, burnout decreased. However, burnout and secondary traumatic stress (r = .34, p < .001) showed a significant positive but weak correlation, indicating that the higher the burnout, the higher the secondary traumatic stress. Furthermore, the degree of caring behavior showed a significant positive correlation with resilience (r = .43, p < .001) and compassion satisfaction (r = .51, p < .001). These results indicated that the higher the compassion satisfaction, the higher the degree of caring be-

Table 3. Differences in Resilience, Professional Quality of Life, and Caring Behavior Based by the General Cherecteristics by Participants ($N = 107$)

Characters	Categories	Resilience		Professional quality of life						Caring behavior	
				Compassion satisfaction		Burnout		Secondary traumatic stress			
		M ± SD	t or F (p)	M ± SD	t or F (p)	M ± SD	t or F (p)	M ± SD	t or F (p)	M ± SD	t or F (p)
Age (yr)	< 27[a]	57.33 ± 11.90	4.26* (.017) c > a, b	32.96 ± 6.4	1.76 (.177)	29.08 ± 5.13	5.42** (.006) a > c	27.96 ± 5.00	1.05 (.354)	92.71 ± 11.75	6.79** (.002) c > a, b
	27~34[b]	55.86 ± 10.43		33.52 ± 4.92		27.90 ± 4.41		27.43 ± 3.95		94.60 ± 14.81	
	≥ 35[c]	66.08 ± 10.22		36.23 ± 3.5		24.23 ± 4.21		26.00 ± 2.77		107.15 ± 8.05	
Marital status	Never married	55.99 ± 11.34	− 3.01** (.003)	32.89 ± 5.82	− 2.27* (.025)	29.14 ± 4.58	4.43*** (< .001)	27.86 ± 4.57	1.46 (.147)	93.58 ± 12.19	− 2.26* (.026)
	Married	63.50 ± 10.21		35.73 ± 4.62		24.58 ± 4.52		26.42 ± 3.68		100.27 ± 15.78	
Education	Diploma[a]	55.81 ± 10.75	1.53 (.223)	33.46 ± 5.85	.64 (.532)	28.78 ± 4.30	2.36 (.10)	27.30 ± 4.93	.32 (.729)	93.89 ± 13.81	6.34** (.003) c > a, b
	BSN[b]	58.12 ± 11.46		33.28 ± 5.35		28.14 ± 5.02		27.81 ± 4.19		93.37 ± 12.96	
	Graduate school and higher[c]	62.15 ± 13.20		35.23 ± 6.58		25.38 ± 5.82		26.85 ± 3.85		107.00 ± 7.44	
Religion	Christian	58.50 ± 11.23	.16 (.922)	34.31 ± 4.02	.44 (.728)	27.65 ± 4.18	.13 (.943)	27.65 ± 5.21	.16 (.921)	98.15 ± 10.66	.73 (.539)
	Catholic	56.60 ± 5.03		34.00 ± 5.29		27.20 ± 6.53		28.20 ± 2.28		94.40 ± 17.94	
	Buddhist	59.88 ± 15.65		34.88 ± 6.66		28.13 ± 5.33		28.25 ± 2.60		97.50 ± 16.22	
	No religion	57.40 ± 11.57		33.12 ± 6.15		28.22 ± 5.16		27.32 ± 4.39		93.87 ± 13.73	
Clinical experiences (yr)	< 1[a]	57.11 ± 12.24	.61 (.612)	33.21 ± 5.27	.79 (.502)	28.37 ± 4.40	3.45* (.019) b > d	27.79 ± 4.53	.35 (.788)	95.00 ± 11.47	2.70* (.050) d < b
	1~< 3[b]	54.83 ± 10.43		31.89 ± 7.37		31.06 ± 5.06		28.06 ± 6.07		89.11 ± 11.25	
	3~< 7[c]	58.35 ± 11.32		33.90 ± 6.07		27.71 ± 4.89		27.74 ± 4.22		93.74 ± 14.55	
	≥ 7[d]	59.10 ± 11.88		34.28 ± 4.58		26.72 ± 4.75		26.95 ± 3.62		99.28 ± 13.32	
Clinical experience with cancer nursing (yr)	< 1	55.85 ± 11.94	.38 (.767)	32.15 ± 6.11	.85 (.468)	28.69 ± 5.04	1.48 (.224)	27.00 ± 4.41	1.08 (.363)	94.73 ± 11.92	1.94 (.128)
	1~< 3	57.87 ± 10.83		34.57 ± 6.49		28.91 ± 5.39		28.04 ± 5.83		95.65 ± 14.65	
	3~< 7	58.22 ± 11.45		33.56 ± 5.73		28.41 ± 4.47		28.52 ± 3.61		90.78 ± 13.94	
	≥ 7	59.06 ± 11.96		34.06 ± 4.48		26.48 ± 4.81		26.68 ± 3.72		99.13 ± 13.39	
Shift	Rotating shift schedule	57.17 ± 10.99	− .49 (.627)	33.07 ± 5.40	− 1.34 (.185)	28.71 ± 4.48	2.01 (.056)	28.02 ± 4.38	2.25* (.026)	93.79 ± 13.83	− 1.483 (.141)
	Fixed shift schedule	58.55 ± 13.13		34.95 ± 6.64		25.80 ± 6.11		25.60 ± 4.07		98.65 ± 9.85	
Clinical position	Staff nurse	56.57 ± 11.25	− .99 (.326)	33.04 ± 6.40	− .84 (.402)	29.17 ± 5.10	2.15* (.034)	27.89 ± 5.29	.79 (.432)	92.19 ± 13.67	− 2.09* (.039)
	Charge/head nurse	58.78 ± 11.68		34.00 ± 5.03		27.13 ± 4.68		27.22 ± 3.57		97.57 ± 12.79	
Workplace	General medicine-surgical ward	57.94 ± 11.31	.25 (.802)	33.43 ± 5.48	− .58 (.564)	28.49 ± 4.54	1.72 (.100)	28.00 ± 4.28	2.52* (.013)	94.69 ± 13.85	− .85 (.397)
	Outpatient clinic/ floating	57.21 ± 12.60		34.26 ± 6.58		25.89 ± 6.24		25.26 ± 4.34		97.58 ± 10.99	
Education related cancer nursing	Yes	59.10 ± 11.37	1.76 (.081)	34.28 ± 5.72	1.95 (.054)	27.59 ± 5.26	− 1.50 (.137)	27.53 ± 4.29	.05 (.964)	96.07 ± 13.92	1.0 (.321)
	No	54.91 ± 11.41		32.00 ± 5.28		29.00 ± 4.07		27.48 ± 4.68		93.27 ± 12.09	
Can take a day off at any time	Yes	59.50 ± 11.10	1.87 (.064)	34.25 ± 5.32	1.50 (.136)	27.59 ± 4.72	− 1.11 (.270)	27.59 ± 4.18	.23 (.820)	96.05 ± 14.03	.79 (.430)
	No	55.30 ± 11.74		32.58 ± 6.07		28.67 ± 5.26		27.39 ± 4.75		93.95 ± 12.43	
Cancer experience with family or friends	Family	56.32 ± 11.35	.701 (.496)	32.62 ± 5.81	1.17 (.315)	28.70 ± 4.85	.97 (.382)	27.68 ± 3.09	.05 (.954)	94.68 ± 11.39	1.14 (.325)
	Friends	57.00 ± 13.31		35.06 ± 5.54		26.72 ± 4.99		27.56 ± 4.54		99.50 ± 14.87	
	No	59.15 ± 10.99		33.75 ± 5.68		28.00 ± 5.01		27.38 ± 5.15		94.10 ± 14.13	

Table 3. Continued

| Characters | Categories | Resilience | | Professional quality of life | | | | | | Caring behavior | |
| | | | | Compassion satisfaction | | Burnout | | Secondary traumatic stress | | | |
		M ± SD	t or F (p)	M ± SD	t or F (p)	M ± SD	t or F (p)	M ± SD	t or F (p)	M ± SD	t or F (p)
Having a supporter or counsellor nearby	Yes	58.14 ± 11.22	1.32 (.189)	33.94 ± 5.39	3.10** (.002)	27.78 ± 4.83	− 2.35* (.021)	27.41 ± 4.45	− 1.09 (.279)	95.39 ± 13.51	1.88 (.063)
	No	51.20 ± 16.27		26.20 ± 6.61		33.00 ± 5.34		29.60 ± 2.61		91.40 ± 11.15	
Job satisfaction	Low (0~3)[a]	42.56 ± 6.82	43.40*** (< .001)	23.78 ± 4.58	75.18*** (< .001) c > b > a	35.78 ± 3.38	45.18*** (< .001) a > b > c	27.11 ± 4.31	.214 (.808)	86.22 ± 11.34	17.39*** (< .001) c > a, b
	Moderate (4~6)[b]	53.02 ± 9.90		31.31 ± 3.43		29.73 ± 3.42		27.80 ± 3.82		89.92 ± 9.58	
	High (7~10)[c]	65.94 ± 7.16		37.91 ± 3.71		24.70 ± 3.93		27.28 ± 5.03		102.66 ± 13.69	

BSN = Bachelor of science in nursing; Charge nurse = Official position; M = Mean; SD = Standard deviation.
[a,b,c,d]Scheffé test.

Table 4. Correlations among Resilience, Professional Quality of Life, and Caring Behavior $(N = 107)$

| Variables | Resilience | Professional quality of life | | | Caring behavior |
		Compassion satisfaction	Burnout	Secondary traumatic stress	
Professional quality of life	1.00				
Compassion satisfaction	.80***	1.00			
Burnout	− .68***	− .70***	1.00		
Secondary traumatic stress	.16	.93	.34***	1.00	
Caring behavior	.43***	.51***	− .42***	.07	1.00

***$p < .001$.

Table 5. Factors Affecting Oncology Nurses' Caring Behavior

Predictor variables	b	SE	ß	t	p-value	Adj R²	F (p)
Constant	55.61	6.43		8.65	< .001	.325	26.48 (< .001)
Compassion satisfaction	1.14	.19	.48	6.00	< .001		
Graduate school and higher	11.29	3.28	.28	3.45	.001		

SE = Standard error; Adj = Adjusted.

havior; further, compassion satisfaction showed a significant inverse correlation with burnout (r = − .42, $p < .001$), indicating that the lower the degree of burnout, the higher the degree of caring behavior.

4. Factors associated with caring behavior

Table 5 presents the final regression model for caring behavior. A stepwise method was used for multiple regression analysis. Resilience and the three subdomains of professional quality of life, which demonstrated a statistically significant correlation with nurses' degree of caring behavior, were selected as the independent variables. Education and job satisfaction, based on which there were statistically significant differences in nurses' degree of caring behavior in the univariate analysis, were included. The nominal variable, education, was converted into a dummy variable and analyzed. As a result of verifying the variance inflation factor and correlation to confirm the multicollinearity between the independent variables, the variance inflation factor of caring was 1.01~2.74, which was less than 10, confirming that there was no correlation between the independent variables. Additionally, the Durbin-Watson value was 1.62, within the range of

1.5 to 2.5, which satisfies the assumption of independence between the independent variables and can admit the suitability of the regression model analysis. The final regression model set in this study was statistically significant (F = 26.48, $p<.001$). Through the stepwise multiple regression analysis, it was confirmed that the factors associated with nurses' degree of caring behavior were compassion satisfaction (t = 6.00, $p<.001$) and education above graduate school (t = 3.45, $p = .001$). The degree of caring behavior showed a significantly strong correlation with compassion satisfaction and education above graduate school, and it increased when compassion satisfaction or education above graduate school increased. This model explained 32.5% of the variance in the degree of caring behavior (adjusted R^2).

DISCUSSION

In this study, we aimed to clarify the factors associated with oncology nurses' caring behavior. We described oncology nurses' resilience, professional quality of life, and degree of caring behavior. We also examined the factors associated with oncology nurses' degree of caring behavior. The participants had low scores for resilience and caring behavior. More than half the participants had moderate or high burnout and secondary traumatic stress. It was confirmed that the degree of caring behavior, resilience, and compassion satisfaction were positively correlated, while caring behavior and burnout were negatively correlated. Compassion satisfaction and education beyond graduate school were significantly associated with the degree of caring behavior.

In this study, the oncology nurses' levels of resilience were lower than those found in previous studies conducted nationally and internationally with operating room nurses, adult intensive care nurses, nurses across all hospital departments, and critical care nurses [8]. In an integrative review that identified resilience in nurses and related factors [8], in nine out of 10 studies that used the same tool as the present study, resilience levels were higher than identified by us. This may be attributed to the elevated levels of burnout reported by the participants in this study. In this study, 75.7% of nurses reported moderate or greater burnout, 83.1% re-

ported moderate or greater secondary traumatic stress, and 26.2% reported high compassion satisfaction. Oncology nurses have to deal with the complexities of cancer treatment, and they also have to bear emotional burdens as they are frequently exposed to dying patients [23–25]. Therefore, oncology nurses may experience greater burnout. Burnout has been identified as a factor that negatively affect resilience [8] and workability [26,27]. Resilience [15] and professional quality of life can also be improved [28]. A systematic review of the literature on coping and resilience in oncology and palliative care nurses highlighted the efficacy of interventions, such as team cohesion promotion, stress–reducing education and training, recovery facilitation, and support for emotional processing and experiential learning [15]. Other studies have corroborated the effectiveness of recognizing compassion fatigue and its consequences, along with developing strategies to mitigate it, to enhance resilience and improve professional quality of life [28]. In an effort to provide quality care to patients with cancer, it is proposed that professional quality of life be measured regularly, and intervention programs should be implemented to increase resilience among oncology nurses.

We found that a total clinical experience between one and three years, working on a rotating shift schedule, particularly in the ward, as a staff nurse with lower job satisfaction, would generate higher levels of burnout and secondary traumatic stress. Additionally, oncology nurses who did not have supporters or counselors reported lower levels of compassion satisfaction and higher burnout rates. Previous research on the emotional burden experienced by oncology nurses has demonstrated that novice nurses report experiencing more emotional distress when they are unprepared for emotional experiences and do not have healthy coping strategies [29]. This may explain why nurses with between one and three years of clinical experience have high levels of burnout and secondary traumatic stress. Benner [30] stated that although a nurse with two to three years of clinical experience can provide appropriate care, the risk of burnout is high, and consequently, the nursing outcome may be poor. Therefore, we suggest that hospitals assign mentors to nurses with fewer than three years of clinical experience or inadequate

resources to build a support system and implement interventions that can increase compassion satisfaction or build healthy coping skills. This may help improve nursing outcomes, including the degree of caring behavior.

The average score for the degree of caring behavior was 4.76, lower than the average of 5.77 (range: 5.69~5.93) among nurses across all hospital departments, measured using the same tool as in another study [31]. The evaluation of the degree of caring behavior in this study encompassed physical, mental, and spiritual care. However, as the care provided by the participants focused on the physical aspect, the level of caring behavior seemed low. This may have been affected by the clinical characteristics of the hospitals from which the participants were recruited. Urban tertiary hospitals in South Korea base the requirement of intensive cancer treatment on the acute stage of the disease, such as chemotherapy, radiotherapy, surgery, etc. In cases where patients have higher levels of severity in an acute care setting, it is not unusual for psychosocial and spiritual care to receive lower priority than physical care [32]. It can also be seen from the list that most of the patient care–related education that hospitals provided to oncology nurses in this study concerned acute care and procedures. Holistic nursing, including psychological and spiritual aspects, is essential for patient–centered nursing [33,34]. Hence, to promote patient–centered nursing, it is necessary to re–educate nurses on the importance of holistic nursing by providing programs that encourage emotional and spiritual nursing practices, as well as physical nursing care.

In addition, care is affected by nurses' emotional intelligence, coping skills, and work environments [35]. In this study, 5.6% of the nurses showed high burnout, secondary traumatic stress, and low compassion satisfaction. The average resilience and degree of caring behavior of this group were lower than those of all participants, and professional quality of life was found to be associated with resilience and degree of caring behavior. This is consistent with our findings regarding resilience, compassion satisfaction, and burnout in relation to care. The high–risk group, on average, was under 30 years of age and had a minimum of two years and a maximum of eight years of clinical experience, suggesting

that providing interventions to improve resilience may be necessary for both novice and experienced oncology nurses. Hence, healthcare organizations and nursing leaders should develop programs that focus on building positive coping systems. Interventions to increase compassion satisfaction may help improve quality of care behaviors in oncology nurses. Age has also been reported to be an individual factor associated with high resilience [27] and high job satisfaction [36]. Unlike Western countries, where most nurses are over 35 years old [37] and can, therefore, be expected to provide high–quality nursing care [37,38], only 12.1% of the nurses in this study were over 35 years old. This may explain why the degree of caring behavior was lower in this study than in studies conducted abroad. Therefore, it is necessary to explore the factors affecting oncology nurses' turnover intention in the South Korean context and provide them with appropriate interventions.

This study had several limitations. First, as our definition of resilience covered only individual factors, excluding organizational factors, there were limitations to understanding nurses' resilience. Therefore, a study that includes both individual and organizational factors is necessary. Second, the regression model explained 32.5% of the variance in caring behavior. This highlights the fact that the determinants of caring behavior go beyond individual influences. Due to the limited number of participants from whom we were able to collect data in this study, we were unable to include in our statistical analysis all of the variables that were expected to influence the extent of oncology nurses' caring behavior when conducting the regression analysis. To overcome this limitation, we conducted a regression analysis using a combination of all of the variables that were identified in the literature and in this study as being significantly related to oncology nurses' caring behavior. Further research is needed to synthesize individual variables that have not yet been identified and to identify additional dimensions such as environmental factors. Finally, as the data collection period was before the coronavirus disease 2019 pandemic, there is the possibility of changes in oncology nurses' resilience, professional quality of life, and caring behavior since then. Therefore, follow–up studies are needed to explore changes in the

factors affecting caring behavior after the pandemic. Despite these limitations, this study is significant because it contributes to the understanding of oncology nurses' resilience, professional quality of life, and caring behavior, which affect the provision of quality nursing care and the treatment outcomes of patients with cancer.

More comprehensive research on the influencing factors and effective strategies is needed to increase caring behavior among oncology nurses. Interventions and educational efforts are required to improve oncology nurses' resilience and professional quality of life in clinical settings. Healthcare organizations should develop targeted education and training programs to increase job satisfaction in clinical practice. Policymakers should prioritize the creation of healthcare environments that foster nurses' compassion satisfaction and impact their care of patients with cancer. Ultimately, these efforts will improve patients' health and quality of life through enhanced caring behavior.

CONCLUSION

We found that oncology nurses' resilience, professional quality of life, and degree of caring behavior were interrelated, and the factors associated with these characteristics were identified. These findings highlight the need for oncology nurses to develop healthy coping skills, including resilience and compassion satisfaction, in order to provide high-quality care. For oncology nurses to develop healthy coping strategies, concerted efforts are required at both the individual and organizational levels. This study has practical implications as it offers valuable insights into oncology nursing, which can be used to develop and implement high-quality nursing care approaches for patients with cancer.

CONFLICTS OF INTEREST

The authors declared no conflict of interest.

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AUTHOR CONTRIBUTIONS

Conceptualization or/and Methodology: Jeon M & Kim SE & Kim SH.

Data curation or/and Analysis: Jeon M & Kim SH.

Funding acquisition: Jeon M & Kim SH.

Investigation: Jeon M.

Project administration or/and Supervision: Kim SH.

Resources or/and Software: Jeon M & Kim SH.

Validation: Jeon M & Kim SE & Kim SH.

Visualization: Jeon M & Kim SH.

Writing original draft or/and Review & Editing: Jeon M & Kim SE & Kim SH.

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