Relationship Between Clinical Nursing Competence and Work Environment by Career Stage for Nurses with 1–10 Years of Clinical Experience

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ABSTRACT

Background   Clinical nursing competence includes ethics, cooperation with other professionals, and management, in addition to nursing abilities and responding per situation. Therefore, it may vary depending on one's experience and the work environment. However, there is a lack of studies exploring the competence for different experience levels. Therefore, this study aimed to clarify the association between clinical nursing competence and the work environment by experience groups.

Methods   Anonymous self-administered questionnaire surveys were conducted on 717 nurses in regional core hospitals from December 2017 to March 2018. Clinical nursing competence was measured using the Clinical Nursing Competence Self-Assessment Scale (CNCSS). Association of CNCSS with experience and work environment was examined.

Results   Responses from 231 nurses with 1–10 years of experience were analyzed. Compared with those in the 2-year experience group, those in the 3–5- and 6–10-year experience groups assessed their "planned development of nursing care" and "assessment of care" competencies to be higher. Additionally, compared with those in the 2-year experience group, those in the 6–10-year experience group assessed their "clinical judgment" and "care coordination" competencies to be higher. Nurses with 1 year of experience showed significant positive correlations between clinical nursing competence and "good interpersonal relationship," "clarity about the organization's vision," and "ease of taking time off"; and those with 6–10 years of experience showed significant positive correlations between clinical nursing competence and "support from superiors and senior coworkers" and "established and easily accessible support system for taking time off for childcare and caregiving."

Conclusion   The relationship between clinical nursing competence and the work environment differed according to years of experience. Interventions to improve clinical nursing competence should be developed for each experience group considering the associations.

Key words   clinical competence; clinical nursing; nurses; professional competence; work environment

The healthcare environment in Japan is rapidly changing because of the declining birthrate, super-aging population, changes in disease structure, and advancements in science and medical technologies. Consequently, the working environment of nurses has changed; they now need to provide comprehensive care according to the complex and diverse needs of patients. Nurses play the role of the final healthcare practitioner who directly treats patients and assists in care; therefore, their work involves a large social responsibility. Given this background, there is a need to train nurses who can guarantee high-quality care and have high clinical competence.

Matsutani et al.[1] defined clinical nursing competence as a set of attributes that include the abilities to integrate knowledge and skills according to situations and provide ethical and effective care, and as a holistic concept that consists of complex activities. Clinical nursing competence includes not only technical skills but also those such as ethics, cooperation with other professionals, management, and research.[2] Additionally, there is a need to respond appropriately according to the circumstances. Clinical nursing competence consists of 6 skills: manipulative, situational judgment, interpersonal relationship, role performance, autonomy, and problem-solving.[3] These elements ensure role fulfillment as a nursing professional. Acquiring and improving clinical nursing competence requires enhancing basic nursing education, undergoing training as new recruits, and continuous learning.[4–8] There is a large gap between nursing abilities immediately after graduation and those required in clinical practice; this gap needs to be addressed in basic nursing education. Therefore, goals to be achieved from basic nursing education[9] have been specified at the time of graduation. For continuous learning, the Japanese Nursing Association has originated a clinical ladder[10] as a system for developing and

assessing nursing abilities that are needed in clinical practice. This ladder has been utilized at the individual level to self-assess and improve clinical nursing competence for self-growth, and at the organizational level as a human resource development and education support tool aligned with an organization's philosophy. Additionally, the "Lifelong learning guidelines for nursing professionals"[11] for efforts toward lifelong learning, and the "Learning support book for nurses,"[12] a learning index, have been formulated for nursing professionals. Further development, maintenance, and improvement of clinical nursing competence are expected.

Factors influencing clinical nursing competence include job satisfaction and opportunities for professional growth, an environment that facilitates consultations,[13] good workplace relationships,[14] and acquisition of basic abilities such as understanding of the subject and nursing process according to age and years of experience.[15, 16] Clinical nursing competence is expected to be acquired by the fifth year of clinical experience[17]; confirming an order of competence acquisition[18] is important to provide intensive educational support for improving clinical nursing competence within approximately 5 years after graduation.[19] Meanwhile, it has also been clarified that there is a stagnation period in the clinical nursing competence development between 5 and 20 years of clinical experience.[20] Previous research surveyed the proficiency levels of advanced beginners,[21, 22] those with 1–5 years of experience,[18, 23] and proficient nurses[20, 24] using Benner's[25] theory. However, few surveys have examined the proficiency of participants ranging from advanced beginners (1–5 years of experience) to competent (5–10 years of experience) and proficient (> 10 years of experience) professionals. In the conceptual analysis of nursing competence,[2] one of the antecedent factors of nursing competence is the "workplace environment factor," and the climate of the organization and ward as well as opportunities for growth are cited as factors. However, few studies have investigated what kind of workplace environment enhances nursing competence. Additionally, there is a lack of studies on participants' proficiency according to their work environment.

Therefore, in this study, we focused on nurses with up to 5 years of working experience, by when the clinical nursing competence is expected to be acquired, and those with 5–10 years of experience, when stagnation of clinical nursing competence is expected. Nurses continue to acquire nursing competence throughout their career[26]; however, proficient nurses have higher competence than advanced beginners but larger individual differences in their extent of development. Therefore,

they were excluded from this study. We then clarified the association between clinical nursing competence and the work environment for those between 1 and 10 years of experience, and examined the support needed for improving clinical nursing competence.

MATERIALS AND METHODS
Participants
There were 717 nurses who did not hold managerial positions higher than the head nurse at regional core hospitals in local cities. Of them, 231 having 1–10 years of experience were selected as participants. We chose a regional core hospital in a local city because we thought that from the advanced beginner stage to the 10th year, the trainees are trained under a consistent educational system based on the philosophy of the organization.

Methods
At head nurse meetings, we explained the purpose of the research to those in charge of each department, and asked them to distribute a research cooperation request form and questionnaire to the participants. We set up questionnaire collection boxes in each department from December 2017 to March 2018 and asked the participants to submit their responses in the collection box at around 3 weeks. The responses were anonymous, and submission of the completed forms was regarded as the consent to cooperate with the research.

Data collection
Participant attributes
We collected data on the following basic attributes: age, sex, license acquisition, main duties, specialized educational background, final educational background, years of facility experience, job title, experience of changing jobs, qualifications obtained, use of qualifications, work style, and intention to continue working.

Work environment
The work environment—the environment surrounding working nurses—is defined by Tanaka et al.[27] as including not only the physical work environment such as working hours and lighting, but also subjective elements such as stress and interpersonal relationships. Therefore, we considered it necessary to include not only environmental factors but also aspects such as interpersonal relationships. Although scales such as the Nursing Work Index-Revised[28] and Essentials of Magnetism II[29] measure nurses' work environment, no scales examine their interpersonal relationships in the workplace. In this study, referencing previous research,[19, 30] we focused on interpersonal relationships, educational systems, and

ease of working and discussed questions related to work environment factors. Consequently, the following seven items were selected:

· Support from superiors or senior colleagues
· Amicable interpersonal relationships
· Clarity about the organization's vision (clear direction to aim for)
· Fairness and objectivity in personnel evaluation and treatment (receipt of appropriate evaluations)
· Satisfactory education and training to gain necessary knowledge and skills (improvement of education and training content, equipment, and systems)
· Established and easily accessible support system for taking time off for childcare and caregiving (enhancement of welfare benefits)
· Ease of taking time off (ability to take vacations as desired)

Each item related to the work environment was answered on a four-point Likert scale and scored as follows: agree = 4, slightly agree = 3, slightly disagree = 2, and disagree = 1. The Cronbach's α coefficient for the above seven items was 0.846, and internal consistency was observed. However, to connect the extracted influencing factors to specific support, we did not conduct scaling and instead used them as observed variables for each analysis item.

Nursing practice self-assessment
We used the Clinical Nursing Competence Self-Assessment Scale (CNCSS) developed by Nakayama et al.[17] after obtaining permission from the original author. The conceptual framework of CNCSS considers clinical nursing competence as a form of competence.

Takemura et al.[31] stated that competence is a comprehensive concept that encompasses human characteristics and personality, including not only actions but also the drive/motivation, self-concept/self-image, knowledge, skills, and thought patterns that led to those actions. Further, competence focuses on the fundamental characteristics behind the actions rather than the actions themselves, and the expression of competence as an observable action is an important characteristic. Therefore, the CNCSS items are expressed using observable and measurable practice behaviors.

CNCSS consists of 3 concepts: basic nursing competency, ability to provide nursing care, and ability to achieve professional growth in clinical nursing practice. The basic nursing competency comprises 3 forms: basic responsibilities, ethical practice, and supportive relationships. The ability to provide nursing care is divided into competency to provide assistance according to the patient's health status and coordinating in the care

environment and teamwork. The concept of competency to provide assistance according to the patient's health status has 4 forms: clinical judgment, nursing plan development, care evaluation, and health promotion; coordinating in the care environment and teamwork has 3 forms: risk management, care coordination, and nursing management (role fulfillment). The ability to achieve professional growth in nursing practice has 3 forms: improved specialization, improved quality, and continuous learning. Sixty-four question items corresponding to these 13 competence items were set and were indicated to be achieved within 5 years after graduating from a nursing university. Table 1 shows the definitions of the 13 competencies. We asked the participants to respond with their extent of achievement for each item on a 4-point scale of "Confident" (4 points), "Somewhat confident" (3 points), "Not very confident" (2 points), and "Not confident" (1 point).

Data analysis
IBM SPSS Statistics 25 was used as the statistical software, with significance level set at 5%.

Analysis of basic attributes
The basic attributes of the participants were described using appropriate summary statistics such as frequency and percentage.

Examination of association between clinical nursing competence and years of experience
We classified the years of experience into 4 groups (1, 2, 3–5, and 6–10) and analyzed the difference in scores of the 13 competence items. Clinical nursing competence is said to be acquired by the fifth year,[17] and years of experience up to the fifth year can be considered a single stage; however, we considered that a significant difference exists in clinical nursing competence scores up to the fifth year depending on the number of years of experience. Therefore, according to the proficiency level indicated by Benner,[25] in this study, we considered the career stages of the nurses and categorized them as follows: 1st and 2nd years, advanced beginner; 3–5 years, competent; and 6–10 years, proficient.

We conducted a normality test (Kolmogorov–Smirnov) and confirmed that there was no normal distribution; therefore, differences between the groups were examined using the Kruskal–Wallis test. We conducted pairwise comparisons using the Dunn–Bonferroni method when significant differences were observed.

Table 1. Definition of 13 forms of competence in CNCSS

		Definition
Basic nursing competency	Basic responsibilities	Being accountable to the patient and responsible for judging own abilities of nursing care.
	Ethical practice	Respecting the patient's will and practicing nursing while being conscious of providing medical care maintaining human dignity.
	Supportive relationships	Communicating and building relationships with the patient while respecting their values and views on life.
Ability to provide nursing care	Competency in providing assistance according to the patient's health status	
	Clinical judgement	Assessing the patient's physical and mental health and responding to daily-changing conditions and circumstances.
	Nursing plan development	Establishing a nursing care plan that meets the individual nature of the patient based on observation and communication, and providing care according to that plan. Additionally, ensuring that records and reports are maintained.
	Care evaluation	Assessing one's own nursing care in relation to patient response and goal achievement, and documenting this in the nursing record. Additionally, assessing and revising the nursing plan as a team through conferences.
	Health promotion	Encouraging the patient's daily life from the time of hospital admission to post-discharge so that they can implement self-control.
	Coordinating in the care environment and teamwork	
	Risk management	Knowing one's behavioral tendencies, sharing guidelines, and working together as a team to avoid mistakes.
	Care coordination	Sharing information with other professionals to coordinate according to patient needs from admission to discharge.
	Nursing management	Being aware of one's roles and responsibilities and supporting the team's and team members so that they can demonstrate their abilities.
Ability to achieve professional growth in nursing practice	Improved specialization	Implementing evidence-based nursing care and performing one's roles and functions as a professional.
	Improved quality	Improving nursing work based on the latest knowledge and adjusting the hospital environment accordingly.
	Continuous learning	Setting goals and improve the self to maintain and improve professional skills.

Examination of factors related to clinical nursing competence

To examine the factors associated with clinical nursing competence, Spearman's rank correlation coefficients were calculated for the associations between the "extent of achievement" scores for the 4 CNCSS concepts: basic nursing competency, competency in providing assistance according to the patient's health status, coordinating in the care environment and teamwork, and ability to achieve professional growth in nursing practice, and the 7 items of work environment.

Ethical considerations

Responses to the questionnaire were anonymous. We distributed a research request form and questionnaire stating the purpose and method of the research, voluntary nature of participation, and that the obtained data would be statistically processed and used only for the research. Submission of the responses was considered as the consent to cooperate with the research.

This research was approved by the Tottori University Faculty of Medicine ethical review board (approval number: 17A055).

RESULTS

Participant attributes

Questionnaires were distributed to 717 nurses, and 418 responses were received (recovery rate: 58.3%). After excluding those with missing values, 363 valid questionnaires were obtained (valid response rate: 86.8%), and responses from 231 nurses having 1–10 years of experience were analyzed. Table 2 shows the basic attributes of the participants. Regarding work experience, 34 participants (14.7%) had 1 year, 21 (9.1%) had 2, 81 (35.1%) had 3–5, and 95 (41.1%) had 6–10 years of experience. The average age of the participants was

Table 2. Basic attributes by number of years of experience

Years of experience	1 ($n = 34$)	2 ($n = 21$)	3–5 ($n = 81$)	6–10 ($n = 95$)	Total ($n = 231$)
Age	22.9 ± 1.6	23.4 ± 0.8	26.5 ± 3.6	30.0 ± 3.0	27.1 ± 4.0
Sex					
Female	29 (85.3)	21 (100.0)	74 (91.4)	84 (88.4)	208 (90.0)
Male	5 (14.7)	0 (0.0)	7 (8.6)	11 (11.6)	23 (10.0)
License acquisition					
Nurse	34 (100)	21 (100)	80 (98.8)	94 (98.9)	174 (75.3)
Public health nurse	16 (47.1)	11 (52.4)	48 (59.3)	48 (50.5)	123 (53.2)
Midwife	3 (8.8)	3 (14.3)	5 (6.2)	6 (6.3)	17 (7.4)
Assistant nurse	1 (2.9)	0 (0.0)	6 (7.4)	2 (2.1)	9 (3.9)
Main duties					
Nurse	31 (91.2)	21 (100)	76 (93.8)	90 (94.7)	198 (85.4)
Public health nurse	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Midwife	3 (8.8)	0 (0.0)	5 (6.2)	5 (5.3)	13 (5.6)
Assistant nurse	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Specialized educational background					
Four-year university	23 (67.7)	14 (66.7)	53 (65.4)	54 (56.9)	144 (62.4)
Junior college (three-year course)	1 (2.9)	1 (4.8)	3 (3.7)	8 (8.4)	13 (5.6)
Vocational school/training institute	10 (29.4)	4 (19.0)	22 (27.2)	29 (30.5)	65 (28.1)
Other	0 (0.0)	2 (9.5)	3 (3.7)	4 (4.2)	9 (3.9)
Final educational background					
Doctoral program	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Master's program	1 (2.9)	0 (0.0)	0 (0.0)	2 (2.1)	3 (1.3)
Four-year university	24 (70.6)	14 (66.7)	56 (69.1)	55 (57.9)	149 (64.5)
Junior college	0 (0.0)	1 (4.8)	2 (2.5)	8 (8.4)	11 (4.8)
Vocational school/training institute	9 (26.5)	4 (19.0)	20 (24.7)	28 (29.5)	61 (26.4)
Other	0 (0.0)	2 (9.5)	3 (3.7)	2 (2.1)	7 (3.0)
Years of facility experience					
1	34 (100)		2 (2.5)	3 (3.2)	39 (16.9)
2		21 (100)	3 (3.7)	4 (4.2)	28 (12.1)
3–5			76 (93.8)	13 (13.7)	89 (38.5)
6–10				75 (78.9)	75 (32.5)
Job title					
Staff	34 (100.0)	21 (100.0)	81 (100.0)	95 (100.0)	231 (100.0)
Deputy head nurse or deputy head nurse equivalent	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Experience of changing jobs					
No	33 (97.1)	21 (100.0)	77 (95.1)	80 (84.2)	211 (91.3)
Yes	1 (2.9)	0 (0.0)	4 (4.9)	15 (15.8)	20 (8.7)
Use of obtained qualifications					
Qualification not used	33 (97.1)	21 (100.0)	77 (95.1)	87 (91.6)	218 (94.4)
Qualification used	1 (2.9)	0 (0.0)	4 (4.9)	8 (8.4)	13 (5.6)
Work style					
Shift work	25 (73.5)	21 (100.0)	77 (95.0)	82 (86.3)	205 (88.7)
Full-time night shift	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mainly day shifts	6 (17.7)	0 (0.0)	2 (2.5)	2 (2.1)	10 (4.3)
Only day shifts	3 (8.8)	0 (0.0)	2 (2.5)	11 (11.6)	16 (7.0)
Intention to continue working					
Will continue	33 (97.1)	18 (85.7)	56 (69.2)	67 (70.5)	174 (75.3)
Will not continue	1 (2.9)	3 (14.3)	24 (29.6)	28 (29.5)	56 (24.3)
Unknown	0 (0.0)	0 (0.0)	1 (1.2)	0 (0.0)	1 (0.4)

Mean ± standard deviation for age. Number of people (percentage) for others.

Table 3. Work environment

n = 231 (%)

Years of experience	1 (*n* = 34)	2 (*n* = 21)	3–5 (*n* = 81)	6–10 (*n* = 95)	Total (*n* = 231)
Support from superiors and senior coworkers					
Strongly disagree	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Disagree	0 (0.0)	0 (0.0)	2 (2.5)	4 (4.2)	6 (2.6)
Agree	10 (29.4)	8 (38.1)	32 (39.5)	52 (54.7)	102 (44.2)
Strongly agree	24 (70.6)	13 (61.9)	47 (58.0)	39 (41.1)	123 (53.2)
Good interpersonal relationship					
Strongly disagree	1 (2.9)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.4)
Disagree	3 (8.8)	1 (4.8)	3 (3.7)	14 (14.7)	21 (9.1)
Agree	12 (35.4)	13 (61.9)	51 (63.0)	48 (50.6)	124 (53.7)
Strongly agree	18 (52.9)	7 (33.3)	27 (33.3)	33 (34.7)	85 (36.8)
Clarity about the organization's vision					
Strongly disagree	1 (2.9)	0 (0.0)	1 (1.2)	0 (0.0)	2 (0.9)
Disagree	2 (5.9)	2 (9.5)	14 (17.3)	17 (17.9)	35 (15.2)
Agree	16 (47.1)	15 (71.5)	49 (60.5)	58 (61.0)	138 (59.7)
Strongly agree	15 (44.1)	4 (19.0)	17 (21.0)	20 (21.1)	56 (24.2)
Fairness and objectivity in personnel evaluation and treatment					
Strongly disagree	0 (0.0)	0 (0.0)	1 (1.2)	1 (1.1)	2 (0.9)
Disagree	1 (2.9)	2 (9.5)	11 (13.6)	8 (8.4)	22 (9.5)
Agree	13 (38.3)	16 (76.2)	41 (50.6)	63 (66.3)	133 (57.6)
Strongly agree	20 (58.8)	3 (14.3)	28 (34.6)	23 (24.2)	74 (32.0)
Satisfactory education and training to gain necessary knowledge and skills					
Strongly disagree	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Disagree	3 (8.8)	0 (0.0)	8 (9.9)	12 (12.6)	23 (10.0)
Agree	7 (20.6)	13 (61.9)	39 (48.1)	59 (62.1)	118 (51.0)
Strongly agree	24 (70.6)	8 (38.1)	34 (42.0)	24 (25.3)	90 (39.0)
Established and easily accessible support system for taking time off for childcare and caregiving					
Strongly disagree	0 (0.0)	0 (0.0)	0 (0.0)	5 (5.3)	5 (2.2)
Disagree	0 (0.0)	4 (19.0)	7 (8.6)	18 (18.9)	29 (12.6)
Agree	18 (52.9)	14 (66.7)	43 (53.1)	54 (56.9)	129 (55.8)
Strongly agree	16 (47.1)	3 (14.3)	31 (38.3)	18 (18.9)	68 (29.4)
Ease of taking time off					
Strongly disagree	1 (2.9)	1 (4.8)	5 (6.2)	11 (11.6)	18 (7.8)
Disagree	5 (14.7)	5 (23.8)	21 (25.9)	30 (31.6)	61 (26.4)
Agree	15 (44.1)	13 (61.9)	38 (46.9)	43 (45.2)	109 (47.2)
Strongly agree	13 (38.3)	2 (9.5)	17 (21.0)	11 (11.6)	43 (18.6)

27.1 ± 4.0 years; 208 were women and 23 were men. For the specialized educational background, 90% of participants attended either 4-year universities (144, 62.4%) or vocational schools and training institutes (65, 28.1%). Regarding work style, 205 (88.7%) worked in shifts, and 10 (4.3%) mainly worked in day shifts, constituting 90%

of the total. A total of 174 (75.4%) intended to continue working.

Work environment

Table 3 shows the participants' work environment. For all items, there were positive responses of "agree" and

Table 4. 13 CNCSS competence item scores (extent of achievement)

Experience groups	1 year (n = 34)			2 years (n = 21)			3–5 years (n = 81)			6–10 years (n = 95)		
	Me-dian	1st quar-tile	3rd quar-tile	Me-dian	1st quar-tile	3rd quar-tile	Me-dian	1st quar-tile	3rd quar-tile	Me-dian	1st quar-tile	3rd quar-tile
Basic nursing competency	3.14	2.92	3.48	2.92	2.52	3.04	3.00	2.83	3.31	3.06	2.89	3.39
Basic responsibilities	3.00	2.75	3.25	3.00	2.63	3.13	3.00	3.00	3.50	3.00	3.00	3.50
Ethical practice	3.33	2.96	3.71	3.00	2.67	3.33	3.17	3.00	3.50	3.17	3.00	3.50
Supportive relationships	3.00	2.63	3.37	2.67	2.25	3.00	2.83	2.50	3.00	3.00	2.67	3.17
Ability to provide nursing care	2.91	2.36	3.09	2.57	2.28	2.88 ab	2.65	2.89	3.08 a	2.97	2.68	3.16 b
Competency in providing assistance commensurate with the patient's health status	2.93	2.30	3.12	2.57	2.25	2.86 cd	2.65	2.94	3.10 c	2.94	2.56	3.17 d
Clinical judgement	2.93	2.14	3.14	2.86	2.14	2.93 e	3.00	2.71	3.14	3.00	2.71	3.43 e
Nursing plan develop-ment	2.89	2.56	3.25	2.67	2.44	2.95 fg	3.00	2.78	3.22 f	3.00	2.67	3.33 g
Care evaluation	3.00	2.55	3.20	2.80	2.30	2.90 hi	3.00	2.60	3.20 h	3.00	2.80	3.20 i
Health promotion	2.90	2.20	3.00	2.60	2.20	3.00	2.80	2.40	3.00	2.80	2.20	3.00
Coordinating in the care environment and team-work	2.85	2.26	3.08	2.58	2.28	2.99	2.86	2.58	3.08	2.92	2.58	3.08
Risk management	3.00	2.69	3.25	3.00	2.50	3.00	3.00	2.75	3.38	3.00	2.75	3.25
Care coordination	2.67	1.92	3.00	2.33	1.84	2.84 j	2.67	2.33	3.00	2.67	2.33	3.00 j
Nursing management	3.00	2.44	3.06	2.75	2.38	3.00	3.00	2.75	3.13	3.00	2.75	3.25
Ability to achieve profes-sional growth in nursing practice	2.82	2.28	3.02	2.39	2.16	2.84	2.72	2.33	3.00	2.81	2.44	3.00
Improved specialization	2.75	2.00	3.06	2.75	2.25	2.88	2.75	2.50	3.00	2.75	2.50	3.00
Improved quality	2.84	2.00	3.00	2.33	2.00	2.67	2.67	2.33	3.00	3.00	2.33	3.00
Learned continuance	3.00	2.63	3.25	2.25	2.00	3.00	2.75	2.38	3.00	2.75	2.25	3.00
Total	2.96	2.49	3.21	2.63	2.31	2.94 k	2.92	2.71	3.09	2.98	2.67	3.17 k

Dunn-Bonferroni method conducted after Kruskal-Wallis test. a–k: significant differences ($P < 0.05$) recognized between same letters. CNCSS, Clinical Nursing Competence Self-assessment Scale.

"strongly agree," with "support from superiors and senior coworkers" and "good interpersonal relationship" having high percentages of $\geq$ 90%. "Ease of taking time off" received fewer positive responses (63.8%) compared with other items.

Comparison of CNCSS competence item scores by years of experience
Table 4 shows the 13 CNCSS competence item scores by years of experience. As a general trend, the scores of nurses with 1 year of experience were relatively high, decreasing for those with 2 years of experience and increasing again for 3–5 years; however, no significant difference was observed between nurses with 1 and 2 years of experience. The total CNCSS score was significantly higher for nurses with 6–10 years of experience than for those with 2 years of experience ($P = 0.020$). There was no significant difference by years of experience for basic nursing competency and ability to achieve professional growth in nursing practice. For the ability to provide nursing care, nurses with 3–5 ($P = 0.028$) and 6–10 ($P = 0.008$) years of experiences scored significantly higher than those with 2 years of experience. In the ability to provide nursing care, "nursing plan development" and "care evaluation" had similar tendencies, and their scores were significantly higher

for nurses with 3–5 (P = 0.014 and 0.040, respectively) and 6–10 (P = 0.013 and 0.012, respectively) years of experience compared with the scores for those with 2 years of experience. "Clinical judgment" and "care coordination" scores had similar tendencies and were significantly higher for 6–10 years of work experience (P = 0.003 and 0.038, respectively) than for 2 years of work experience. There were no statistically significant differences for "health promotion," "risk management," and "nursing management" in the ability to provide nursing care.

Association between clinical nursing competence and work environment

Table 5 shows the results of Spearman's rank correlation coefficient by years of experience for the association between CNCSS score and work environment. Many items contributed to a positive correlation between clinical nursing competence and work environment for 1 year and 6–10 years of work experiences.

For those with 1 year of experience, there was a significant positive correlation between all 4 concepts of clinical nursing competence and "good interpersonal relationship," "clarity about the organization's vision," and "ease of taking time off." Particularly high correlations were observed between competency in providing assistance according to the patient's health status and "good interpersonal relationship," (r = 0.483, P < 0.01); coordinating in the care environment and teamwork and "good interpersonal relationship," (r = 0.454, P < 0.01); and coordinating in the care environment and teamwork and "ease of taking time off," (r = 0.491, P < 0.01). "Support from superiors and senior coworkers" was not associated with any concept.

For nurses with 2 years of experience, although there were fewer items that correlated compared with that in other experience groups, significant positive correlations were observed between basic nursing competency and "clarity about the organization's vision," (r = 0.531, P < 0.05), basic nursing competency and "fairness and objectivity in personnel evaluation and treatment," (r = 0.482, P < 0.05), and ability to achieve professional growth in nursing practice and "clarity about the organization's vision," (r = 0.581, P < 0.01). No statistically significant correlation was observed between competency in providing assistance according to the patient's health status and coordinating in the care environment and teamwork. Additionally, no associations were observed between the 5 work environment items ("support from superiors and senior coworkers," "good interpersonal relationship," "satisfactory education and training to gain necessary knowledge and skills," "established

and easily accessible support system for taking time off for childcare and caregiving," and "ease of taking time off,") and all 4 clinical nursing competence concepts.

Similarly, there were fewer items with association for nurses with 3–5 years of experience, but there was a significantly positive correlation between all 4 concepts and "fairness and objectivity in personnel evaluation and treatment" (r = 0.246–0.287, P < 0.05). Additionally, no associations were observed between 4 awareness items ("support from superiors and senior coworkers," "good interpersonal relationship," "clarity about the organization's vision," and "satisfactory education and training to gain necessary knowledge and skills,") and any of the 4 clinical nursing competence concepts.

For nurses with 6–10 years of experience, a correlation was found between all 4 competence concepts and "support from superiors and senior coworkers" (r = 0.254–0.321, P < 0.05) and "established and easily accessible support system for taking time off for childcare and caregiving," (r = 0.233–0.329, P < 0.05). In this group, more items showed correlations compared with the other experience groups, but there were no associations between "ease of taking time off," and all 4 competence concepts.

DISCUSSION

First, we examined the relationship between the 13 CNCSS competency item scores and years of experience; thereafter, we examined the factors related to clinical nursing competence and nurses' work environment.

Regarding the 13 competence item scores of the 4 experience groups, those with 3–5 and 6–10 years of experiences had higher confidence in "nursing plan development" and "care evaluation" than did those with 2 years of experience. Nurses with 6–10 years of experience had higher confidence in "clinical judgment" and "care coordination" than did those with 2 years of experience; and the 3–5- and 6–10-year experience groups assessed their ability to provide nursing care to be higher compared with the 2-year experience group. These findings are consistent with those of previous studies mentioning that "clinical judgment" and "nursing plan development" competencies improved over time.[18, 24]

"Nursing plan development" and "care evaluation," which constitute the ability to provide nursing care, form the nursing processes from daily information gathering to assessment and nursing practice. These abilities are formed by learning and accumulating experience while interacting with patients and are necessary for developing the nursing care skills of a competent nurse.

Table 5. Association between CNCSS score and work environment

Years of experience		Support from superiors and senior coworkers	Good inter-personal relation-ship	Clarity about the organi-zation's vision	Fairness and objec-tivity in personnel evaluation and treat-ment	Satis-factory education and train-ing to gain necessary knowledge and skills	Established and easily accessible support system for taking time off for childcare and care-giving	Ease of taking time off
1	Basic nursing competency	0.125	0.387*	0.407*	0.325	0.260	0.244	0.361*
	Competency in providing assistance according to the patient's health status	0.243	0.483**	0.426*	0.424*	0.378*	0.327	0.418*
	Coordinating in the care environment and teamwork	0.214	0.454**	0.398*	0.418*	0.405*	0.404*	0.491**
	Ability to achieve professional growth in nursing practice	0.274	0.411*	0.442**	0.439**	0.427*	0.452**	0.379*
2	Basic nursing competency	−0.024	−0.046	0.531*	0.482*	0.349	0.044	0.153
	Competency in providing assistance according to the patient's health status	−0.186	−0.139	0.324	0.123	0.089	0.006	0.128
	Coordinating in the care environment and teamwork	−0.081	−0.161	0.307	0.068	0.130	0.106	0.054
	Ability to achieve professional growth in nursing practice	0.089	0.022	0.581**	0.384	0.138	0.113	0.200
3-5	Basic nursing competency	0.023	0.178	0.177	0.260*	0.200	0.210	0.211
	Competency in providing assistance according to the patient's health status	0.170	0.069	0.015	0.257*	0.159	0.124	0.197
	Coordinating in the care environment and teamwork	0.162	0.014	0.195	0.246*	0.129	0.238*	0.243*
	Ability to achieve professional growth in nursing practice	0.029	0.084	0.074	0.287**	0.097	0.200	0.178
6-10	Basic nursing competency	0.321**	0.216*	0.347**	0.317**	0.276**	0.274**	0.073
	Competency in providing assistance according to the patient's health status	0.254*	0.214*	0.346**	0.299**	0.209*	0.294**	0.138
	Coordinating in the care environment and teamwork	0.295**	0.214*	0.300**	0.185	0.192	0.329**	0.129
	Ability to achieve professional growth in nursing practice	0.255*	0.032	0.177	0.136	0.244*	0.233*	0.015

Spearman's rank correlation coefficient by years of experience. Statistical significance at P value. **$P < 0.01$, *$P < 0.05$. CNCSS, Clinical Nursing Competence Self-assessment Scale.

Further, "clinical judgment" and "care coordination" require abilities beyond providing care to patients—to cooperate with other professionals and make judgments. Compared with "nursing plan development" and "care evaluation," they offer fewer situations and opportunities for experience, and it takes time to accumulate these experiences. Consequently, previous studies have reported an association between years of experience and clinical nursing competence.[15, 16] An aspect of the ability to provide nursing care, which comes from "nursing plan development," "care evaluation," "clinical judgment," and "care coordination," is to give meaning to

the experience in clinical settings and to acquire clinical nursing competence with experience.

There was no difference between basic nursing competency and ability to achieve professional growth in nursing practice according to years of experience. "Basic responsibilities," "ethical practice," and "supportive relationships," which constitute basic nursing competency, are core abilities of nursing that are learned from basic education. There are more opportunities to gain these experiences from the first year of work compared with other abilities; therefore, no differences were seen. "Improved specialization," "improved quality," and "continuous learning," which constitute the ability to achieve professional growth in nursing practice, tended to have lower scores than other forms of competence for all experience groups. These findings are consistent with those of previous research[18, 24]; it may be related to low self-assessment. Unlike basic nursing competency and the ability to provide nursing care, the ability to achieve professional growth in nursing practice requires nurses to be aware of their specialized profession and of their daily nursing practice. They become aware of it with clinical experience. In this study, the extent of achievement was assessed; therefore, it may be that nurses struggled to say that they were confident about it, despite having experience.

Nurses with 1 year of experience assessed their clinical nursing competence highly and had more confidence compared with other groups. This may be because training guidelines for new nursing staff[3,27]have been formulated, with each facility having clear goals, and there are environments in which nurses can plan to achieve these goals and feel their own growth through regular self-assessment and assessment by others. Katsuyama[32] stated that receiving approval from others leads to an increase in self-esteem and is related to a change in the self-esteem of others. It is likely that nurses with 1 year of experience had more confidence because they received more support from others and more opportunities for approval compared with other groups. Feedback from assessment by others is an opportunity for the nurses to reflect on their practice and leads to further learning and practice. However, scores tended to decrease from the second year of work experience. Therefore, there is a need to examine how support can be provided for nurses with 2 or more years of experience.

Subsequently, we discuss the factors related to nurses' clinical nursing competence and work environment.

Compared to the other groups, first-year nurses had more items for which an association was observed between clinical nursing competence and work environment. A significant number of nurses in the 1-year experience group were anxious about adapting to the workplace, not only in terms of adapting to their first workplace but also in terms of nursing practice. Good interpersonal relationships in the workplace enabled new nurses to seek help, consult with others, and feel accepted in the workplace when they faced difficulties. Imai[33] reported that, when new nurses have a sense of belonging to the workplace, as well as a sense of contribution that helps surrounding people, they have improved ability to respond to multiple problems and improved quality of nursing. Interpersonal relationships in the workplace are the foundation of working as a nurse, and in addition to having a sense of belonging and affiliation, it also leads to the formation of an environment wherein nurses can focus on nursing practices; therefore, it is related to clinical nursing competence. Manabe et al.[34] stated that it is important for students or advanced beginners during their occupational identity formation as nurses to establish clear norms and assessment criteria in addition to workplace relationships, which allow for value sharing and enhances a sense of belonging to a group. The researchers discussed the importance not only of interpersonal relationships in the workplace but also of the vision of the organization, which serves as the basis for behavior and judgment. Having clear indices makes it possible to improve nursing practices toward a goal, which helps build the clinical nursing competence.

"Ease of taking time off" was associated with all 4 concepts of clinical nursing competence for nurses with 1 year of experience. Considering that they are dealing with an unfamiliar workplace or work, interpersonal relationships, and shift work, being able to secure one's own time away from the workplace may be associated with improved clinical nursing competence. In a survey conducted by Karasawa et al.[35] the advanced beginner nurses demand that nursing managers prepare a working environment in which they can take physical and mental rest. They reported that a work environment in which it is easy to secure leave to rest and refresh oneself away from the workplace and work is highly satisfactory as a work environment and leads to the acquisition of nursing practice skills. The ability to take time off as desired enriches employees' private lives, helps them achieve work–life balance, and can potentially improve clinical nursing competence. A feature of first-year nurses was the presence of a moderate relationship between clinical nursing competence and work environment. Considering the above, the issues to be focused on are adjustment in interpersonal relationships, clarification

of the organization's vision, an environment where it is easy to take time off, and satisfactory training and education systems.

Previous research[30, 36, 37] has reported the usefulness of the involvement and support of nursing managers and seniors for new nurses; however, it has also been reported that the clinical nursing competence of new nurses was not associated with the support from head, deputy head, and senior nurses.[21, 22, 38] Consistently, in this survey, "support from a superior or senior colleague" did not help new nurses confidently practice nursing care. New nurses have many opportunities for their nursing practice to be assessed and to feel their practice improve, while also being beginners. Benner[25] stated that new nurses are only just beginning to notice important patterns of generally adhering to guidelines and repeatedly striving in clinical practice. It is difficult to say whether they can confidently practice nursing while being aware of their professional immaturity and receiving support; therefore, confidence was not associated with support from a superior or senior colleague. Nakahara[39] stated that support from others in the workplace includes the following 3 components: work support (advice and guidance on work), introspection support (feedback on individual cognition and behavior), and mental support (emotional support related to work such as encouragement). The support requested by the recipient may not match the one provided. Individual factors such as the circumstances of the support recipient, how they accept it, and the clinical nursing competence of the support provider have an impact. Why support from a superior or senior colleague was not associated with improved clinical nursing competence should be explored in future studies.

Nurses in their second year of experience become more accustomed to the workplace and with interpersonal relationships, and become aware of the difference between their own and others' abilities. Matsuoka[40] stated that nurses in the second year after graduation are in a transitional period from passive learning to independent learning to fulfill their roles and to begin exploring nursing knowledge. There was a strong association between the ability to achieve professional growth in nursing practice and clarity about the organization's vision; organizational vision is useful as an indicator for nurses to increase their own professional awareness. Unlike in their first year, when they received large amounts of support, in their second year, nurses get less support and need to be more independent. They need support through which they can be aware of their own issues and roles within the vision of the organization. As nurses deal with various challenges and situations at work, they strive continuously toward improvement through self-learning, and as they repeat their training, they gain the ability to overcome the challenges and acquire more competence.[41] Taking action and facing problems by oneself leads to the acquisition of clinical nursing competence. Educational support is needed in the period of transitioning from an advanced beginner to a competent nurse as an extension of beginner education that considers the characteristics of nurses in their second year of experience.

Nurses in their 3–5th year were competently implementing their nursing practice and were also assigned more departmental responsibilities, with roles such as preceptors and day-to-day duty leaders that increased their work burden. Our findings clarified that fairness and objectivity in personnel evaluation and treatment was a related factor that increased clinical nursing competence in this group. Mizutani et al.[42] stated that, if nurses could perceive their importance, they would be able to further improve their expertise, which would result in continuation of work. Assessments from and treatment by others have been reported as factors determining the value of one's existence in an organization; it was observed in the present study in "fairness and objectivity in personnel evaluation and treatment" increasing clinical nursing competence. Nurses having 3–5 years of experience need to be assigned roles according to their individual abilities, should identify the value of their presence, objectively understand their roles and issues, take action, and be supported to fulfill their roles.

Nurses having 6–10 years of experience exhibited associations between all 4 clinical nursing competencies and "support from superiors and senior coworkers" and "established and easily accessible support system for taking time off for childcare and caregiving." An association with "support from superiors and senior coworkers" was found only for this experience group. Support from bosses and senior colleagues is significant while forming and realizing a career. Hirase et al.[43] reported that acceptance and approval by nursing managers are important for proficient nurses for promoting career development. Additionally, an "established and easily accessible support system for taking time off for childcare and caregiving" increased all forms of clinical nursing competence; therefore, it can be said that proficient nurses are at crossroads between balancing work and family as well as in their careers. It is also the period of stagnation of clinical nursing competence,[20] and support that considers the nurses' individual circumstances and enables career formation and realization is needed.

The results of this survey clarified that the factors

related to clinical nursing competence differed according to years of experience. The results suggested that providing support considering the roles and characteristics of each experience group may be a factor in increasing clinical nursing competence.

This study had some limitations. The recovery rate of the questionnaire was 58.3%; thus, it may have biases in the analysis data. Moreover, nurses in only 1 facility were targeted, and thus generalizability of the results is limited. Additionally, there were limitations of internal validity and the use of univariate analysis in this study, and hence, confounding factors cannot be excluded. Therefore, future work is necessary for the analysis method.

Furthermore, careful consideration and examination of the work environment as well as factors that influence clinical nursing competence from varied perspectives, such as the facility's educational system and nursing provision method, will be tasks for future research.

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