Factors Affecting Clinical Nursing Competency: A Cross Sectional Study

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ABSTRACT

Background   The purpose of this study was to elucidate the factors which affect the achievement of clinical nursing competency.

Methods   A survey was conducted on 717 nurses using an anonymous self-administered questionnaire. Their clinical nursing competency was assessed using the Clinical Nursing Competence Self-Assessment Scale (CNCSS). This study examined the factors affecting clinical nursing competency using regression analyses. A simple regression analysis was performed with the CNCSS as the objective variable. A multiple regression analysis was performed using the items for which the relationship was clarified as explanatory variables.

Results   The factors affecting the "basic nursing competency" were age, ease of taking time off, workplace with a clear vision, and good interpersonal relationships. The factors affecting the "competency in providing assistance commensurate with the patient's health status" were total years of experience, workplace with a clear vision, ease of taking time off, and use of acquired certifications. The factors affecting the "coordinating care environment and teamwork" were total years of experience, workplace with a clear vision, use of acquired certifications, and ease of taking time off. The factors affecting the "ability for professional growth in nursing practice" were use of acquired certifications, workplace with a clear vision, total years of experience, and ease of taking time off.

Conclusion   For improvement of clinical nursing competency, the factors elucidated to be necessary were accumulation of experience as a nurse, a clear vision of goals, and a work environment with good interpersonal relationships and ease of getting days off. The way nurses make their nursing practice experience meaningful contributed toward their growth as nurses. It is important to train nurses through basic education and continued education with awareness of achievement and improvement of clinical nursing competency. Basic education should promote the ability to make clinical training experience meaningful and continuing education should enable nurses to continue to grow independently through reflection.

Key words   clinical nursing competence self-assessment scale; clinical nursing competency; influencing factors

In Japan, the environment surrounding healthcare is changing dramatically with rapid development and progression of declining birth rates and an aging population, advancement of medical technology, changes in disease structures, and increased awareness of rights of the people. As a consequence of these changes, there has been an interest in clinical competency of nurses, resulting in an increasing number of nursing colleges and diversification of the educational background of nurses. In such settings, a nurse is required to have accurate nursing skills and other appropriate skills based on advanced knowledge. Medical institutions are required to strengthen the postgraduate education to ensure nursing care quality and to provide advanced nursing care to patients. It is very important to foster nursing competency in basic nursing education, new employee education, and continuing education in order to provide high quality nursing care. Fostering of nursing competency also affects the career development of nurses as professionals and development of their identities. The Ministry of Education, Culture, Sports, Science and Technology established an "Investigative Commission on Nursing Science Education" in 2001, issued a written report on the "Development of Clinical Nursing Competency in Universities" in 2002, proposed "Goals by College Graduation for the Development of Clinical Nursing Competency" in 2004, and raised issues on clinical education in nursing colleges. Since 2010, medical institutions have been mandated to increase their efforts in new nursing staff training due to the 2009 partial amendment of the Act on Public Health Nurses, Midwives, and Nurses and the Act on Assurance of Work Forces of Nurses and Other Medical Experts. These institutions have been making efforts to foster nursing competency in new nurses and have been providing continuing education to increase competency in each nurse in his/her second year and beyond. In 2012, the Japanese Nursing Association created a "Guide to the Standards of Continuing Education (ver. 2)" and published guidelines to enhance an organizational

system for providing education and to improve educational content so that nurses can receive continuing education of certain standards. As described above, it is desirable for all nurses to be able to think and act independently and to be able to provide nursing care in various settings – such as in public health, medical care, and social services – (i.e., to have clinical nursing competency), which they gain through their entire career.[1]

Clinical nursing competency is the ability to take action by combining knowledge, skills, values, beliefs, and experience acquired as a nurse and can be viewed as an integrated performance reflecting the nursing professional's feelings, thoughts and judgment.[2] The reliability and validity of nursing competency evaluation have been verified including in studies of concepts and structures of nursing competency,[3] development of measurement scales,[4] and goodness-of-fit index of scale.[5] Hara et al.[6] examined the relationship between nurses' critical thinking orientation and nursing competency and found that "objectivity" among critical thinking orientations had the strongest positive relationship with clinical nursing competency. Hatanaka et al.[7] examined the relationship between professional identity and nursing competency in mid-career nurses. Their results suggested that the nurses were not evaluating their own practice and were not properly evaluated by others. The authors, therefore, indicated the need for a support system that enables nurses to what value nurses find in practice experience contributed to their growth as a nurse, in order to establish a professional identity, it is necessary to have a support system that can self-evaluate the nursing practice conducted by oneself as effective. In addition, Uemura et al.[8] clarified the relationship between learning behavior and nursing practice ability. As a result, "learning through participation in training," "learning through reflection," "learning through practice," and "learning through feedback" contributed to the improvement of nursing practice skills. They pointed out that work-related learning support is important to promote the improvement of nursing practice skills.

Studies examining factors affecting nursing competency have shown that age and an increased number of years of experience promote the achievement of basic nursing competency, such as understanding of patients and the nursing process.[9, 10] Hagiwara et al.[11] examined workplace satisfaction and motivation and suggested that influencing factors are support in nursing practice, self-determination, opportunity to grow, and good work relationship. However, only a few studies have examined influencing factors, such as the work environment, and have made suggestions on educational support which coordinates basic education and continuing education to promote achievement of nursing competency.

The purpose of this study was to elucidate the factors affecting the achievement of clinical nursing competency. It is important to examine educational implications to basic and continuing nursing education and improvement of the work environment so that nurses can achieve and improve their competency in practice.

SUBJECTS AND METHODS
Subjects
The subjects were 717 nurses, excluding managerial staff of chief nurse or higher positions, who worked at a regional core hospital in a local city.

Methods
At the meeting of nursing department heads of a regional core hospital in a local city, the supervisor of each department was asked to distribute forms to nurses of his/her department. These forms were a request to participate in the study and a questionnaire which were distributed to the nurses between December 2017 and March 2018. A box was set up to collect the questionnaires at each department and the participants were asked to return them within three weeks. The questionnaire was anonymous and the returning of the questionnaire was deemed a consent to participate in the study.

Data collection
Subject attributes
The examined subject attributes were age, sex, acquired license, main function, professional educational background, total years of experience, years of experience at a healthcare facility, employment position, history of career change, acquired certifications, use of acquired certifications, work arrangement (such as shift system or daytime hours), and intention to continue working at the present hospital.

Awareness of work environment
The awareness of work environment was assessed by asking the participants whether the following seven items existed at their workplace: support from superiors and senior coworkers, good interpersonal relationship, workplace with a clear vision, fairness and objectivity in personnel evaluation and treatment, 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. The participants evaluated each item using a four-point scale (4: agree, 3: somewhat agree, 2: somewhat disagree, and 1: disagree).

Table 1. Definitions of 13 competencies in CNCSS

		Definitions
Basic nursing competency	Basic responsibilities	Responsibilities for nursing care that one provides, which involve accountability toward patients and judgment of one's own abilities
	Ethical practice	Practice of nursing that respects patients' decisions and that is performed with constant awareness in medical care, which maintains dignity of patients as human beings
	Supportive relationships	Relationships built with patients through mutual understanding via communication and by respecting patients' values, life philosophies, and intentions.
Ability to provide nursing care	Competency in providing assistance commensurate with the patient's health status — Clinical judgment	Conclusion at which nurses arrive after assessing patients' physical and mental health and ways nurses come to respond to patients' conditions and circumstances which change daily
	Nursing plan development	Act of providing care through planning of individualized nursing care based on observation and communication; act of accurately recording and reporting so that the effectiveness of nursing care can be maintained.
	Care evaluation	Assessment of one's nursing care by evaluating the relationships between patients' responses and achievement of goals, by recording information in nursing records, and by evaluating and revising planned nursing with team members through conferencing
	Health promotion	Act of enabling patients to gain control over their own daily lives based on the outlook of their lives from hospital admission to post-discharge
	Coordinating care environment and teamwork — Risk management	Process of preventing errors by understanding one's tendency of action and sharing guidelines and cooperating with other team members
	Care coordination	Organization of patient care activities by sharing information with other professionals from the period of hospital admission to discharge and adjusting care needed by patients
	Nursing management (role fulfillment)	Act of supporting the team and its members so that they can demonstrate their abilities and in which one is aware of his/her roles and responsibilities
Ability for professional growth in nursing practice	Improved specialization	Act of improving the performance of evidence-based nursing care and fulfillment of roles and functions as professionals
	Improved quality	Act of improving nursing practice based on the latest findings and adjusting the hospital environment
	Learned continuance	Process of continued self-improvement with goals of maintaining and improving abilities as professionals

Nursing practice self-assessment

This study used the Clinical Nursing Competence Self-Assessment Scale (CNCSS) with the permission of its developers, Nakamura et al.[2] The conceptual framework of CNCSS is based on the thinking that the Japanese term "*kango jisen nouryoku*" (ability to practice nursing) is nursing competence. Competence involves knowledge, skills, ability to take action to satisfactorily perform one's professional duties in addition to ethics, values, and the ability to perform reflective practice. It is the ability to recognize the importance of the context of such practice and the ability built on recognition that there are multiple effective methods of practice.[12, 13] Therefore, competence itself is not observable and can be examined only through actions as a consequence of itself. Thus, competence was represented in survey questions as observable and measurable actions in practice.

For competency, 64 questions were created on abilities, which are generally expected to be attained in five years after graduation from a nursing college. Table 1 shows the definitions of 13 competencies. The

participants were asked to answer each question from two aspects, "frequency of implementation" and "degree of achievement," using a four-point Likert scale. The "frequency of implementation" was evaluated on a scale of always implemented (4 points), usually implemented (3 points), sometimes implemented (2 points), and not implemented at all (1 point). The "degree of achievement" was evaluated on a scale of perform with confidence (4 points), some confidence (3 points), not much confidence (2 points), and no confidence (1 point).

Data analysis
Data analysis was performed using statistical software SPSS Statistics 25 (IBM, Armonk, NY) and the level of significance was set at 5%.

Analysis of basic attributes
The basic attributes of participants were described using appropriate summary statistics, such as frequencies and percentages.

Analysis of primary endpoints
Descriptive statistics of "frequency of implementation" and "degree of achievement" were calculated for the 13 competencies. In addition, Spearman's rank correlation analysis was performed to examine the relationship between the two aspects, "frequency of implementation" and "degree of achievement," for the four concepts of "basic nursing competency," "competency in providing assistance commensurate with the patient's health status," "coordinating care environment and teamwork," and "ability for professional growth in nursing practice."

Examination of factors affecting clinical nursing competency
The factors affecting nursing competency were first examined by simple regression analysis using, as an objective variable, each of the above four concepts from the CNCSS "degree of achievement." Explanatory variables were age, sex, professional educational background, total years of experience, years of experience at a healthcare facility, history of career change, use of acquired certifications, intention to continue working at the present hospital, and seven items of awareness of work environment. In addition, those variables which were clearly found to have a positive relationship in the simple regression analysis were used as explanatory variables in a stepwise multiple regression analysis.

Ethical considerations
As mentioned earlier, the subjects received a request form to participate in the study and a questionnaire form. These forms stated that the questionnaire was anonymous for privacy reasons and described the study's purpose and methods. The forms also explained that participation in the study was voluntary and that the obtained data were to be treated statistically and used only for the study. The returning of the questionnaire was deemed a consent to participate in the study. This study was conducted with the approval of the ethics review committee of the Faculty of Medicine, Tottori University (approval number: 17A055).

RESULTS
Subject attributes
The questionnaire was distributed to 717 nurses, of whom 418 responded (response rate: 58.3%). The respondents with missing values were excluded, resulting in 363 valid respondents as subjects for analysis (valid response rates: 86.8%). Table 2 shows the subject attributes. There were 334 women and 29 men with an average age of 32.16 ± 8.42 years. The average years of experience and years of experience at a healthcare facility were 9.68 ± 7.86 and 7.53 ± 6.34 years, respectively. The employment position was staff for 333 respondents and assistant head nurse or equivalent for 30 respondents. The nurses with a history of career change accounted for 19.3% of valid respondents and most had no history of career change. There were 91 nurses who had some type of nursing-related certification and were using it, accounting for 25.1% of valid respondents. There were 285 nurses (78.5%) who had the intention to continue working at the present hospital.

Awareness of work environment
Table 3 shows the responses regarding the subject's awareness of work environment. Over 85% of the subjects who responded either agreed or somewhat agreed for six of the seven items.

Nursing practice self-assessment
CNCSS scores
Table 4 shows the scores for 13 competencies. The results of "frequency of implementation" and "degree of achievement" are expressed below as the median value (first quartile - third quartile) for each of the four concepts: "basic nursing competency," "competency in providing assistance commensurate with the patient's health status," "coordinating care environment and teamwork," and "ability for professional growth in nursing practice." The median values value (first quartile - third quartile) for "frequency of implementation" and "degree of achievement" were 3.00 (3.00–4.00) and 3.00 (3.00–4.00), respectively, for "basic nursing

Table 2. Subject attributes

Age	25 years or younger	91	25.1%
	26–28 years	64	17.6%
	29–32 years	69	19.0%
	33–39 years	72	19.8%
	40 years or older	67	18.5%
Sex	Female	334	92.0%
	Male	29	8.0%
Acquired license(s) (multiple answers allowed)	Registered nurse	359	
	Public health nurse	141	
	Midwife	27	
	Practical nurse	17	
Main function	Public health nurse	3	0.8%
	Midwife	21	5.8%
	Nurse	339	93.4%
Professional educational background	Four-year college	159	43.8%
	Junior college (three-year program)	62	17.1%
	Vocational or training school	129	35.5%
	Other	13	3.6%
Highest achieved education level	Master's degree	9	2.5%
	Four-year college degree	169	46.6%
	Two-year college degree	56	15.4%
	Vocational or training school degree	116	32.0%
	Other	13	3.6%
Total years of experience	1st year	34	9.4%
	2nd year	21	5.8%
	3rd–5th year	81	22.3%
	6th–10th year	95	26.2%
	11th–20th year	98	27.0%
	21st year	34	9.4%
Years at a healthcare facility	1st year	40	11.0%
	2nd year	29	8.0%
	3rd–5th year	103	28.4%
	6th–10th year	105	28.9%
	11th–20th year	72	19.8%
	21st year	14	3.9%
Employment position	Staff	333	91.7%
	Assistant head nurse or equivalent	30	8.3%
History of career change	No	293	80.7%
	Yes	70	19.3%
Acquired certification(s) (multiple answers allowed)	Certified nurse administrator	1	
	Certified nurse	17	
	Certified nurse specialist	3	
	Board certified member	37	
Acquired certification(s) is/are used.	"Not used" category	272	74.9%
	Do not have certification	260	
	Somewhat disagree	5	
	Disagree	7	
	"Used" category	91	25.1%
	Somewhat agree	43	
	Agree	48	
Work arrangement	Shift system	301	82.9%
	Mainly daytime hours	18	5.0%
	Only daytime hours (exempt from night shifts)	43	11.8%
	Other	1	0.3%
Intention to continue working at the present hospital	Do not intend to continue	76	20.9%
	Intend to continue	285	78.5%
	Don't know	2	0.6%

Table 3. Awareness of work environment

				$n = 363$ (%)
	Disagree	Somewhat disagree	Somewhat agree	Agree
There is support from superiors and senior coworkers.	2 (0.6)	13 (3.6)	167 (46.0)	181 (49.9)
There is a good interpersonal relationship.	4 (1.1)	38 (10.5)	198 (54.5)	123 (33.9)
There is a clear vision at the workplace.	4 (1.1)	56 (10.5)	203 (54.5)	100 (33.9)
There is fairness and objectivity in personnel evaluation and treatment.	5 (1.4)	38 (10.5)	202 (55.6)	118 (32.5)
There is satisfactory education and training to gain necessary knowledge and skills.	1 (0.3)	31 (8.5)	189 (52.1)	142 (39.1)
There is an established and easily accessible support system for taking time off for childcare and caregiving.	7 (1.9)	45 (12.4)	200 (55.1)	111 (30.6)
There is ease of taking time off.	35 (9.6)	106 (29.2)	155 (42.7)	67 (18.5)

Table 4. Scores for 13 competency components of CNCSS

	Frequency of implementation			Degree of achievement		
	Median	1st quartile	3rd quartile	Median	1st quartile	3rd quartile
Basic nursing competency	3.00	3.00	4.00	3.00	3.00	4.00
Basic responsibilities	3.00	3.00	4.00	3.00	3.00	4.00
Ethical practice	3.00	3.00	4.00	3.00	3.00	4.00
Supportive relationships	3.00	3.00	3.00	3.00	3.00	3.00
Ability to provide nursing care	3.00	3.00	4.00	3.00	3.00	3.00
Competency in providing assistance commensurate with the patient's health status	3.00	3.00	4.00	3.00	3.00	3.00
Clinical judgment	3.00	3.00	4.00	3.00	3.00	4.00
Nursing plan development	3.00	3.00	4.00	3.00	3.00	3.00
Care evaluation	3.00	3.00	3.00	3.00	3.00	3.00
Health promotion	3.00	2.00	3.00	3.00	2.00	3.00
Coordinating care environment and teamwork	3.00	3.00	4.00	3.00	3.00	3.00
Risk management	3.00	3.00	4.00	3.00	3.00	4.00
Care coordination	3.00	2.00	3.00	3.00	2.00	3.00
Nursing management (role fulfillment)	3.00	3.00	4.00	3.00	3.00	3.00
Ability for professional growth in nursing practice	3.00	2.00	3.00	3.00	2.00	3.00
Improved specialization	3.00	2.00	3.00	3.00	2.00	3.00
Improved quality	3.00	2.00	3.00	3.00	2.00	3.00
Learned continuance	3.00	2.00	3.00	3.00	2.00	3.00
Overall	3.00	3.00	4.00	3.00	3.00	3.00

competency," 3.00 (3.00–4.00) and 3.00 (3.00–3.00) for "competency in providing assistance commensurate with the patient's health status," 3.00 (3.00–4.00) and 3.00 (3.00–3.00) for "coordinating care environment and teamwork," and 3.00 (2.00–3.00) and 3.00 (2.00–3.00) for "ability for professional growth in nursing practice."

Relationship between "frequency of implementation" and "degree of achievement" for the four concepts
Spearman's rank correlation analysis was performed to examine the relationship between the two aspects, "frequency of implementation" and "degree of achievement," for the four concepts of "basic nursing competency," "competency in providing assistance

Table 5. Relationship between "frequency of implementation" and "degree of achievement" for the 4 concepts

		Degree of achievement			
		I	II	III	IV
Frequency of implementation	I	.775**	.712**	.635**	.600**
	II	.695**	.840**	.734**	.647**
	III	.607**	.718**	.846**	.685**
	IV	.557**	.657**	.681**	.885**

Spearman's rank correlation coefficient. **$P < .01$. I: Basic nursing competency. II: Competency in providing assistance commensurate with the patient's health status. III: Coordinating care environment and teamwork. IV: Ability for professional growth in nursing practice.

commensurate with the patient's health status," "coordinating care environment and teamwork," and "ability for professional growth in nursing practice" (Table 5). The results showed that there was a positive correlation between the two aspects for all four concepts. The strongest correlation was found between the two aspects for the "ability for professional growth in nursing practice" ($r = 0.885$).

Examination of factors affecting clinical nursing competency

Simple regression analysis
The four concepts for the CNCSS "degree of achievement" were each treated as an objective variable and simple regression analysis was performed to examine the factors affecting nursing competency. Below are the explanatory variables with a significant positive relationship with the four concepts.

For the "basic nursing competency," such explanatory variables were age, professional educational background, total years of experience, years of experience at a healthcare facility, history of career change, use of acquired certifications, and all seven items of awareness of work environment.

For the "competency in providing assistance commensurate with the patient's health status," such explanatory variables were age, professional educational background, total years of experience, years of experience at a healthcare facility, history of career change, use of acquired certifications, and 6 items of awareness of work environment (good interpersonal relationship, workplace with a clear vision, fairness and objectivity in personnel evaluation and treatment, satisfactory education and training to gain necessary knowledge and skills, established and easily accessible support system for taking time off for childcare and care giving, and ease of taking time off).

For the "coordinating care environment and teamwork," such explanatory variables were age, professional

educational background, total years of experience, years of experience at a healthcare facility, history of career change, use of acquired certifications, and all seven items of awareness of work environment.

For the "ability for professional growth in nursing practice," such explanatory variables were age, professional educational background, total years of experience, years of experience at a healthcare facility, history of career change, use of acquired certifications, and all seven items of awareness of work environment.

Multiple regression analysis
The variables which were found to have a positive relationship by simple regression were used as explanatory variables in multiple regression analysis. These explanatory variables were age, professional educational background, total years of experience, years of experience at a healthcare facility, history of career change, use of acquired certifications, and all seven items of awareness of work environment (Table 6). The results are expressed as standardized coefficient (b) and 95.0% confidence interval. Variance inflation factor (VIF) and tolerance were calculated to examine multicollinearity. The results were VIF = 1.019–1.454 and tolerance = 0.688–0.981, and it was determined that there was no multicollinearity.

DISCUSSION
In this study, the average age and total years of experience of the subjects were 32.16 ± 8.42 and 9.68 ± 7.86 years, respectively, indicating that the majority had 10 years or less experience. The "basic nursing competency" tended to have the highest score, a result that is consistent with that of Karasuda et al.[14] The "ability for professional growth in nursing practice" had the lowest scores for "frequency of implementation" and "degree of achievement" at 3.00 (2.00–3.00) among the four concepts of CNCSS. This concept also had the lowest score in the report of Karasuda et al.,[14] a result consistent with

Table 6. Examination of factors affecting CNCSS

| | | Standardized coefficient | t value | P | 95.0% confidence interval | | Adjusted R² |
		β			Lower limit	Upper limit	
I. Basic nursing competency	(Constants)		12.376	0.000	1.603	2.209	0.147
	Workplace with a clear vision	0.161	2.786	0.006	0.031	0.182	
	Age	0.218	4.423	0.000	0.006	0.017	
	Ease of taking time off	0.162	3.128	0.002	0.031	0.136	
	Good interpersonal relationships	0.130	2.216	0.027	0.010	0.166	
II. Competency in providing assistance commensurate with the patient's health status	(Constants)		16.607	0.000	1.876	2.380	0.131
	Workplace with a clear vision	0.198	3.855	0.000	0.071	0.219	
	Total years of experience	0.236	4.724	0.000	0.009	0.021	
	Ease of taking time off	0.144	2.770	0.006	0.024	0.140	
	Use of acquired certification	0.109	2.205	0.028	0.014	0.238	
III. Coordinating care environment and teamwork	(Constants)		15.484	0.000	1.744	2.252	0.167
	Workplace with a clear vision	0.227	4.513	0.000	0.096	0.245	
	Total years of experience	0.247	5.063	0.000	0.010	0.022	
	Use of acquired certification	0.155	3.200	0.001	0.071	0.296	
	Ease of taking time off	0.146	2.860	0.004	0.027	0.144	
IV. Ability for professional growth in nursing practice	(Constants)		14.022	0.000	1.683	2.232	0.136
	Use of acquired certification	0.219	4.445	0.000	0.154	0.398	
	Workplace with a clear vision	0.184	3.599	0.000	0.067	0.228	
	Total years of experience	0.176	3.532	0.000	0.005	0.019	
	Ease of taking time off	0.126	2.430	0.016	0.015	0.142	

Stepwise multiple regression analysis.

ours. In CNCSS, the "ability for professional growth in nursing practice" is the ability to implement nursing care based on the latest findings and evidence, to fulfill the roles and functions as a professional, and to continue self-improvement with the goals to maintain and improve abilities as a professional. The ability to improve oneself is considered essential to grow as nurses.

We discuss here the factors which were shown to affect nursing competency. The ability to use acquired certifications affected the "competency in providing assistance commensurate with the patient's health status," the "coordinating care environment and teamwork," and the "ability for professional growth in nursing practice" of CNCSS. Since use of acquired certifications did not

affect the "basic nursing competency," such use can be said to be a major factor helping nurses advance to the next stage after acquiring the "basic nursing competency." Nakano et al.[15] suggested a positive relationship between nursing competency and a work environment which allows one to demonstrate one's professionalism. Nurses who use their acquired certifications integrate their specialized knowledge and skills with nursing practice and continue to improve themselves as they grow as nurses. The need for support has been suggested so that the work environment can continue to allow nurses to apply their professionalism and acquired certifications.

A good interpersonal relationship in the work

environment affected the "basic nursing competency." Hagiwara et al.[11] found that a good relationship among nursing staff positively affected competency. This good interpersonal relationship increased workplace satisfaction and was associated with the intention to continue working at the present hospital. In our study, 88.4% of the nurses acknowledged that there was a good interpersonal relationship in the workplace and 78.5% of the nurses intended to continue working at the present hospital. "Basic nursing competency" also include competency in building supportive interpersonal relationships. The ability to build interpersonal relationships is considered one of the most essential abilities because nursing is a human-to-human relationship, and this ability is also constantly used in practice. It is essential in relationships not only with patients and nurse coworkers but also with people in other professions with whom nurses cooperate to perform their duties. In a workplace with good interpersonal relationships, a positive synergistic effect is speculated to exist in which individual nurses are able to fully demonstrate their abilities.

Our study showed that a workplace with a clear vision and ease of taking time off affected all four concepts of CNCSS. Nakano et al.[15] suggested that the intention to continue working and growth of nurses are affected by their clear personal career plan and policies of their affiliated organization (nursing department) and by their ability to understand the policies. The ability of nurses to experience their own growth is thought to build confidence to achieve nursing competency. Manabe et al.[16] found that there was a positive relationship between nursing competency and components of work-environment satisfaction, which were "taking time off" and "balance between work and personal life." These authors also suggested that nurses with a higher competency level have a higher satisfaction level of the current work environment, a result that is consistent with that of our study.

In our study, age affected the "basic nursing competency," and total years of experience affected the "4 competency in providing assistance commensurate with the patient's health status," "coordinating care environment and teamwork," and "ability for professional growth in nursing practice." Age and years of experience were shown to affect the achievement of nursing competency in studies mainly of Mikami et al.[9] and Yanagisawa et al.[10] The key to improving nursing competency is not just accumulating experience as nursing professionals but also making the experience meaningful and useful in future nursing practice. When nurses have only a few years of experience, they often lack confidence and composure in their execution of work and tend to use most energy trying to perform nursing duties well. Yamauchi et al.[17] showed that nurses with experience of 3 years or less had a "desire to do work in which one can apply his/her attributes and abilities even if the work is difficult" and indicated a stronger desire for learning and more ambition than more experienced nurses. Thus, it is important for organizations to understand and support such ambition.

In our study, the factors elucidated to be necessary to improve nursing competency were accumulating experience as a nurse, having a clear vision of a goal, and a work environment with good interpersonal relationships and ease of getting days off. In addition, our results suggested that nurses who use their acquired license strive to improve themselves through clinical nursing practice and to grow as nurses.

Sasaki et al.[18] compared nursing competencies by years of experience of nurses. They examined nurses' competencies achieved from the first to fifth year of clinical experience and found that competency levels were stagnant from the third to fourth year and then began to improve again from the fourth to fifth year. Achievement was not uniform among competencies and the timing of achievement differed by competency. Takase et al.[19] examined the relationship between nursing competency and years of experience of nurses. Their results indicated similarities with a growth curve of nurses which shows a rapid initial growth and a subsequent gradual growth. These results indicate the need for support with considerations for the sequence of nursing competency achievement and improvement. The results also indicated the importance of providing educational support, focusing on the first five years after nursing college graduation. This period is speculated to be a time of rapid growth as nurses, which is indicated by a sharply rising curve of nursing competency with increasing years of experience.

Studies, mainly of Mikami et al.[9] and Yanagisawa et al.,[10] reported that leadership and ability to practice nursing skills are abilities which increase with increasing years of clinical experience. Nanke et al.[20] also reported that abilities related to leadership and critical care develop with accumulation of experience. Leadership, ability to practice nursing skills, and ability related to critical care are similar to competencies included in the "competency in providing assistance commensurate with the patient's health status" and the "coordinating care environment and teamwork" of CNCSS. On the other hand, the results of Nanke et al.[20] suggested that simply accumulating clinical experience does not improve abilities related to "education and cooperation," "planning and evaluation," "interpersonal relationship

and communication," and "professional development." Hasebe et al.[21] negated the correlation between nursing competency and years of experience. These results indicate that nursing competency can potentially be classified as the ability to improve with age and through one's own effort and the ability to improve through clinical experience and with support from others. It is difficult to improve nursing competency by merely accumulating experience, and how one makes such experience meaningful likely contributes to the growth as a nurse. It is also necessary to elucidate through what experience nursing competency is achieved and improved and to use the results as basic data for educational support. Basic education and continuing education are designed with the awareness of nursing competency achievement and improvement. Basic education nurtures the basic thinking ability to reflect on one's nursing experience and fosters the ability to make clinical training experience meaningful. Continuing education fosters the reflective ability to cultivate practical intelligence and trains nurses who continually and independently grow.

This study has some limitations. First, this study had potential bias in analyzed data because the questionnaire response rate was 58.3%. Another limitation was that the study was conducted in nurses from a single institution and it is difficult to generalize the results. We intend to increase the number of subjects by surveying other institutions with a similar size and to examine factors affecting nursing competency by educational background and years of experience.

In conclusion, for improvement of clinical nursing competency, the factors elucidated to be necessary were accumulation of experience as a nurse, a clear vision of goals, and a work environment with good interpersonal relationships and ease of getting days off. The way nurses make their nursing practice experience meaningful contributed toward their growth as nurses. It is important to train nurses through basic education and continued education with awareness of achievement and improvement of clinical nursing competency. Basic education should promote the ability to make clinical training experience meaningful and continuing education should enable nurses to continue to grow independently through reflection.

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