



NURSE MANAGERS' PERCEPTION AND PRACTICE ON THE THEORY OF TECHNOLOGICAL COMPETENCY AS CARING IN NURSING: A PRELIMINARY STUDY

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ABSTRACT

In spite of emphasis on patient-centered care and promotion of their quality, shortcomings have been seen in psychiatric care due to lack of compassion. To improve the quality of psychiatric caring in nursing, it is important to develop and implement in-service education based on Locsin's Technological Competency as Caring in Nursing (TCCN) theory. Objectives to determine psychiatric nurse managers' perception and practice status as a preliminary survey to serve as a resource for in-service psychiatric nursing education. This survey was conducted in August 2022 using the Technological Competency as Caring in Nursing Instrument-Revised for Practice (TCCNI-RePract) scale at "A" psychiatric hospital. Descriptive statistics and Wilcoxon's signed-rank tests were used. Eleven head nurses and assistant head nurses participated in this study. Mean values for the perception dimension of each item of the TCCNI-RePract were high, whereas mean values for practice dimension were low. The results indicated that perception dimension was significantly higher than practice dimension in 21 of 26 items of the TCCNI-RePract. Nurse managers demonstrated a high level of perception of the TCCN theory; however, many practical items scored low. Nurse managers suggested developing a current educational program to inform practice based on the TCCN theory.

Keywords: *Advanced technologies, caring in nursing, in-service education, technological competency*



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INTRODUCTION

Currently, advanced technologies are being used in psychiatric care, including computed tomography, magnetic resonance imaging, optical topography, and other medical testing equipment, as well as mobile apps, wearable technology, and remote sensors. These technologies are used to assist in patient care for a range of disorders, such as schizophrenia, mood disorders, dementia, personality

disorders, and eating disorders (Depp et al., 2016; Dewa et al., 2021; Naslund et al., 2017; Riva & Serino, 2020; Strudwick et al., 2019).

Additionally, monitoring and assessing the pathophysiology, treatment, and side effects of patients with schizophrenia in psychiatry requires technical abilities and information such as medical history, primary and secondary diagnoses,

intelligence quotient, positive and negative syndrome scale, brief psychiatric rating scale results, medication blood levels, and side effects of antipsychotic drugs (such as malignant syndrome, water intoxication, akathisia, etc., and criteria for determining these). These aspects are essential to consider when providing nursing care based on the caregiving approach.

Recently, advances in digital technology in medicine, such as online medical care, telenursing using information and communication technology (Heo et al., 2021), electronic prescriptions, online guidance by pharmacists, and electronic centralized management of patient information, have made it possible to share a large amount of medical information, including various test data and medical record information. These technologies aim to make accurate diagnoses in determining how we treat our patients, while deriving a course of treatment.

However, focusing solely on information obtained from technology neglects the caring aspect that is so important to the nursing profession and does not help in healing the patient, who is the primary focus of nursing care. Therefore, it is crucial to understand technology, its usage (judgment and practical skills), as well as the ability to provide care and demonstrate compassion towards the patient, as it is an integral part of nursing.

Locsin (2005) suggested that "in nursing, it is important to fully understand the unpredictable and ever-changing human being" and that "the art of care allows us to know and understand the patient more fully as a person." However, in nursing practice that is merely technically skilled without the theoretical foundation of the TCCN theory, the recipients of care (patients and families) are likely to be treated as objects, and it is important to view patients as irreplaceable persons to design patient-centered nursing.

Contemporary healthcare is undergoing significant transformations due to various factors, including changes in disease patterns, an aging population, declining birth rates, and the impact of the COVID-19 pandemic (Mamom & Daovisan, 2022). Consequently, there is a growing need for nursing professionals with advanced practical skills to respond to the increasing diversity and complexity of medical needs. Nurses must also be involved in determining which aspects of nursing practice can be delegated to technology (Pepito & Locsin, 2019). Therefore, it is essential for the nursing profession to possess advanced practical skills to address the increasing diversity and complexity of medical needs. In Japan, however, education on caring in nursing has not yet been geometrically well known, and it is difficult to say that it has taken root in basic nursing education. In addition, some nurses do not have experience with educational content related to caring in nursing. Therefore, it is important to develop in-service education that incorporates the TCCN theory.

McCausland (2012) notes that new interdisciplinary models of care that transcend the traditional boundaries of outpatient, inpatient, and community require trusted clinical leadership. The nurse manager is recognized as an individual responsible for enhancing patient care services and strengthening nursing practice. Leadership is an essential element in providing quality care to patients and in improving nurses' ability to practice.

Clinically competent nurses are thoroughly familiar with collaborative working relationships, autonomous nursing

practice, appropriate staffing, optimization of competent nursing practice, managerial support, and patient-centered culture to create an environment that ensures quality nursing practice competence. Joseph and Huber (2015) found that recognition within the team and leadership in responsibilities impact patient outcomes.

In previous research, the Caritas Coach Education Program based on Watson's theory has been implemented in in-service education on caring in nursing, and post-education evaluation has been reported (Brewer et al., 2020). Additionally, in-service education based on the TCCN theory focuses on technology and caring, was also conducted by Nakano et al. for nurse managers in hospitals providing highly advanced medical care, evaluating their perceptions after a formalized education program using the Technological Competency as Caring in Nursing Instrument-Revised (TCCNI-R) to assess post-education perceptions (Nakano, Yokotani, Tanioka, et al., 2021).

However, current in-service education based on the TCCN theory has not been conducted for psychiatric nurses. In psychiatric nursing, where advanced technology is used, the development and introduction of in-service caring-based education on the TCCN theory is important for improving the quality of psychiatric nursing. There is an urgent need to design, develop, and evaluate in-service education programs specific to psychiatric nursing that provide practice based on the TCCN theory.

This study aims to determine psychiatric nurse managers' perception and practice status using the TCCNI-Revised for Practice (TCCNI-RePract) as a preliminary survey to serve as a resource for in-service psychiatric nursing education.

METHOD

Study design

This study is a preliminary investigation using a self-administered questionnaire survey with the TCCNI-Revised for Practice (TCCNI-RePract) as a preliminary step in developing a psychiatric nursing version of the TCCN theory of in-service education program. Selected psychiatric hospital for this study conducted in-service education based on the caring in nursing theory.

Participants

The participants were nurse managers in one of the psychiatric and psychosomatic hospitals with an acute, chronic, and dementia ward with approximately 300 beds in Japan. Convenience sampling method was employed. Eleven nurse managers engaged in psychiatric nursing practices participated in this preliminary study. Meanwhile, we excluded: a) Persons who are not qualified as registered nurses; b) Nursing directors and deputy nursing directors involved in organizational management; c) Nurses with no previous management experience in psychiatric nursing; and d) The participants were those who did not give their consent to participate in the study.

Instrument

The questionnaire survey consists of two parts: personal attributes, and the TCCNI-RePract questionnaire. For personal attributes, the participants were asked information regarding their gender, age, employment position, length of experience as a registered nurse, length of experience as a psychiatric nurse, and length of experience in psychiatric nursing management.

For the TCCNI-RePract, it was used to measure whether or not nurses can percept and practice the TCCN theory in clinical practice arenas. The instrument consisted of 52 items, 26 each for the perception dimension and 26 items for the practice dimension. In a previous study, the TCCNI-Repract was surveyed among nurses in acute and general wards and structured into four factors and 21 items using exploratory factor analysis, which was tested for reliability and validity (Yokotani et al., 2021). Additional items were added to the TCCNI-RePract (50 items) for the perception and practice dimension, and modified, resulting 52 items for this questionnaire survey.

The perception dimension questionnaire items were developed with a 7-point Likert scale, with values ranging from 1 as "Strongly Disagree" to 7 as "Strongly Agree." The practice dimension questionnaire items were developed with a 7-point Likert scale with values ranging from 1 as "Never" to 7 as "Always."

Data collection

An anonymous self-administered questionnaire survey was conducted from August 1, 2022 to August 31, 2022. The self-administered questionnaires, TCCNI-RePract, were distributed to 11 head nurses and assistant head nurses. To protect privacy, personal collection envelopes were distributed at the same time as the questionnaires and the questionnaires were sealed in the collection envelopes. The researchers collected them.

Data analysis

Regarding the data analysis, one participant did not answer Q1 and another participant did not answer Q11 in the perception and practice dimensions of the collected response

data. Due to missing values in these items, question items Q1 and Q11 were excluded from the analysis.

Descriptive statistics were conducted to compare the medians of the perception and practice dimensions evaluated using TCCNI-RePract using Wilcoxon signed rank sum tests. P values less than 0.05 were considered statistically significant. Data analysis was performed using R (version 4.2.2, R Foundation for Statistical Computing, Vienna, Austria) (R Core Team, 2022)."

Ethical consideration

The ethical approval for this study was obtained from the Ethics Committee of Tokushima University Hospital, Japan (approval number 2914-3). Participation by the subjects was voluntary; no penalty was applied if they decided to quit the study at any time during data collection. Personal information was kept confidential by securing access using a password. All personal data were secured in the researcher's computer that was also accessible only through a password known only by the principal researcher.

RESULTS

Table 1 shows the demographic characteristics of the subjects. A self-administered questionnaire was distributed to 13 participants, and 11 who responded were included in the analysis. The mean age was 54.1 years, ranging from 46 to 63 years. The average number of years of psychiatric nursing experience was 24.5 years. All participants had more than 20 years of nursing experience. The mean number of years of psychiatric nursing management experience was 11.3 years, ranging from 2 to 22 years.

Table 1. Demographic data

Items (N=11)		n (%)	Mean (SD)	Range
Gender	Male	6 (54.5)		
	Female	5 (45.5)		
Age (in years)	40-49	4 (36.4)	54.1 (6.3)	46-63
	50-56	4 (36.4)		
	More than 60	3 (27.3)		
Employment position	Nurse manager	6 (54.5)		
	Assistant Head Nurse	5 (45.5)		
Length of experience as a registered nurse (in years)	20- less than 30	4 (36.4)	32.5 (5.9)	25-44
	30- less than 40	6 (54.5)		
	More than 40	1 (0.91)		
Length of experience as a psychiatric nurse (in years)	5- less than 10	1 (0.91)	24.5 (5.9)	7-33
	10- less than 20	1 (0.91)		
	20- less than 30	5 (45.5)		
	30- less than 40	4 (36.4)		
Length of experience as a nursing management (in years)	1- less than 5	2 (18.2)	11.3 (6,7)	2-22
	5- less than 10	3 (27.3)		
	10- less than 20	4 (36,4)		
	More than 25	2 (18.2)		

Table 2 shows the score for the TCCN-Repract perception dimension. Missing values were found in Q1 and Q11 and were excluded from the analysis. The item of perception dimension with the highest score was Q7 (M=6.45, SD=0.50,

95%CI=6.10-6.81), while the item with the lowest score was Q12 (M=4.55, SD=0.99, 95%CI=3.85-5.24). The ceiling effect was observed in Q17 only. No floor effect was observed in all items.

Table 2. Mean, standard deviation, and 95% confidence interval of the Technological Competency as Caring in Nursing Instrument - Revised and Practice (TCCNI-Repract): Perception dimension

Question number and Items (N=11)	Mean	SD	95% CI	
			LL	UL
Q1 Nurses must emphasize thoughtfulness and consideration for patients.	—	—	—	—
Q2 Nurses are professionals who express caring utilizing competency with technology	5.36	0.77	4.82	5.91
Q3 Nurses have to provide care for patients by using necessary technologies.	5.73	0.86	5.12	6.33
Q4 Nurses must provide nursing care through the harmonious relationship between technological knowing and caring.	5.91	0.51	5.55	6.27
Q5 Nurses need to consider providing nursing care because each patient's wishes always change.	5.55	0.89	4.92	6.17
Q6 Nurses must make a plan of care together with the patient to ensure quality nursing.	5.73	0.62	5.29	6.16
Q7 Nurses need to know patient's health data in order to take care of the patient.	6.45	0.50	6.10	6.81
Q8 Nurses must share information with their patients in order to know them better.	5.73	0.75	5.20	6.26
Q9 Nurses must provide care with a thorough understanding of their own competency.	5.64	0.98	4.95	6.33
Q10 Nurses have to use technology in order to know patients as persons who are complete and to maintain honest relationships with them.	5.82	0.83	5.23	6.41
Q11 Nurses must finish nursing duties within a specific time even if they cannot completely know the patients, for example, their emotional needs or feelings. *	—	—	—	—
Q12 Nurses must respect patients' beliefs and focus on their recovery, while anticipating their hopes, needs, and desires.	4.55	0.99	3.85	5.24
Q13 Nurses need to maintain patients' lifestyles and allow them to regain their healthy lives.	5.27	0.96	4.59	5.95
Q14 Nurses must emphasize thoughtful consideration of patient's feelings, encouragement, and respect.	5.73	0.45	5.41	6.04
Q15 Nurses need to provide timely nursing care in accordance with patients' physical and emotional conditions.	6.18	0.72	5.68	6.69
Q16 Nurses must be devoted towards meeting the patient's needs, hopes, wishes, and dreams.	5.82	0.72	5.31	6.32
Q17 Nurses must act by carefully listening to the patients' voices and expressing compassion.	6.18	0.94	5.52	6.84
Q18 Nurses must consider patient's stress and anxiety level occurring within the nurse-patient relationship.	5.91	0.51	5.55	6.27
Q19 Nurses have to know the patients not only focusing on their physical aspects but also on accurately understanding "who they are as persons.	6.09	0.67	5.62	6.56
Q20 Nurses' competence includes the use of healthcare technologies from the perspective of caring in nursing.	5.82	0.57	5.41	6.22
Q21 Knowing the patient is understanding the whole person.	5.73	0.75	5.20	6.26
Q22 Nursing as caring is the involvement of nurses with patients and their families in ways that allow them to grow together in the shared nursing situation.	5.45	0.66	4.99	5.92
Q23 Nurses use technologies with competency in order to know patients.	5.55	0.99	4.85	6.24
Q24 Nurses use technologies with competency in order to know patients' families.	5.27	1.05	4.53	6.01
Q25 Technology is useful for understanding patients' health conditions.	5.82	0.72	5.31	6.32
Q26 Nurses use technology with competency as caring to facilitate patients' recovery with enhanced self-esteem.	4.91	0.51	4.55	5.27

SD: Standard Deviation, CI: Confidence Interval, LL: Lower Limit, UL: Upper Limit. Likert scale measurement, with values ranging from 1 as Strongly disagree; 2 Disagree; 3 Somewhat disagree; 4 Neither agree or disagree; 5 Somewhat agree; 6 Agree; to 7 as Strongly agree. —, missing value.

Table 3. Mean, standard deviation, and 95% confidence interval of the Technological Competency as Caring in Nursing Instrument - Revised and Practice (TCCNI-Repract): Practice dimension

Question number and Items (N=11)	Mean	SD	95% CI	
			LL	UL
Q1 I emphasize thoughtfulness and consideration of patients. *	—	—	—	—
Q2 I express caring utilizing competency with technology.	4.73	0.45	4.41	5.04
Q3 I provide care for patients by using necessary technologies.	4.82	0.57	4.41	5.22
Q4 I am providing nursing care through the harmonious relationship between technological knowing and caring.	4.82	0.57	4.41	5.22
Q5 I consider patient's wishes in providing nursing care because their wishes always change.	4.64	0.48	4.30	4.98
Q6 I am making care plans together with the patient to ensure quality care.	2.55	1.23	1.68	3.41
Q7 I am assessing patients' health data when taking care of patients.	4.73	1.14	3.93	5.53
Q8 I share information with patients to get to know them better.	4.18	0.94	3.52	4.84
Q9 I am providing nursing care with a thorough understanding of my own competency.	4.55	1.16	3.73	5.36
Q10 I use technology to know patients as complete and to maintain honest relationships with them.	4.82	0.39	4.55	5.09
Q11 I finish my work within the established work time even if I could not know the patient. *	—	—	—	—
Q12 I respect patients' beliefs, focus on their recovery, and anticipate their hopes, needs, and desires.	4.36	0.77	3.82	4.91
Q13 I am caring for patients to maintain their lifestyles and allow them to regain their healthy lives.	4.91	0.79	4.35	5.47
Q14 I am considerate, supportive, and respectful of the patient.	4.91	0.51	4.55	5.27
Q15 I provide timely nursing care in accordance with patients' physical and emotional conditions.	4.64	0.64	4.18	5.09
Q16 I am caring for patients to fulfill their needs, hopes, and dreams.	4.45	0.78	3.90	5.01
Q17 I am listening to the patient's voices and showing my compassion.	5.36	0.64	4.91	5.82
Q18 I provide care and consider the stress and anxieties that the patient has during a nurse-patient relationship.	4.82	1.03	4.09	5.54
Q19 I am working to know patients by focusing on their physical aspects and by understanding who the patient is.	4.73	0.96	4.05	5.41
Q20 I use healthcare technologies as one of my nursing competencies from the perspective of caring in nursing.	3.91	0.67	3.44	4.38
Q21 I am working to know the patient by understanding the patient as a whole.	4.45	0.89	3.83	5.08
Q22 I am providing nursing care by involving patients and families and including me in their growth within the nursing situations.	4.45	0.99	3.76	5.15
Q23 I use technologies with competence as an expression of my caring in order to know patients.	3.91	1.24	3.04	4.78
Q24 I use technologies with competence as an expression of my caring in order to know patients' families.	3.82	1.34	2.88	4.76
Q25 I use technology to understand patients' health conditions.	4.55	1.56	3.45	5.64
Q26 I am using technology and providing caring to facilitate patients' recovery with enhanced self-esteem.	3.73	1.14	2.93	4.53

SD: Standard Deviation, CI: Confidence Interval, LL: Lower Limit, UL: Upper Limit. Likert scale measurement, with values ranging from 1 as Never; 2 Very rarely; 3 Rarely; 4 Occasionally; 5 Frequently; 6 Very frequently; to 7 as Always. —, missing value.

Table 3 shows the score for the TCCN-Repract practice dimension. Missing values were found in Q1 and Q11 and were excluded from the analysis. The item of practice dimension with the highest score was Q17 (Mean=5.36, SD=0.54, 95%CI=4.91-5.82), while the item with the lowest score was Q6 (Mean=2.55, SD=1.23, 95%CI=1.68-3.41). No floor effect was observed in all items. However, a ceiling effect and floor effects were not observed.

Table 4 shows the comparison results using Wilcoxon's signed rank test based on median values, comparing the corresponding perception and practice dimension of the TCCNI-RePract. The results show significant differences for all items except for questions Q2, Q12, and Q13. In particular, for Q6, a median difference of more than 3.0 was found between the perception and practice dimensions, with a median value of 2.0 (IQR = 2.0-3.0) for the practice dimension, which was the lowest among all question items.

Table 4. The compared results of the perception and practice situation of the TCCNI-RePract

	TCCNI-RePract Perception (N=11)		TCCNI-RePract Practice (N=11)		p
	Median	IQR	Median	IQR	
Q1	—	—	—	—	—
Q2	5.0	5.0-6.0	5.0	4.5-5.0	0.063
Q3	6.0	5.0-6.0	5.0	4.5-5.0	0.008
Q4	6.0	6.0-6.0	5.0	4.5-5.0	0.002
Q5	5.0	5.0-6.0	5.0	4.0-5.0	0.016
Q6	6.0	5.0-6.0	2.0	2.0-3.5	0.001
Q7	6.0	6.0-7.0	5.0	4.0-5.5	0.001
Q8	6.0	5.5-6.0	4.0	4.0-5.0	0.008
Q9	6.0	5.5-6.0	5.0	4.0-5.0	0.008
Q10	6.0	5.5-6.0	5.0	5.0-5.0	0.016
Q11	—	—	—	—	—
Q12	5.0	4.0-5.0	4.0	4.0-5.0	0.750
Q13	6.0	5.0-6.0	5.0	4.0-5.5	0.481
Q14	6.0	5.5-6.0	5.0	5.0-5.0	0.031
Q15	6.0	6.0-7.0	5.0	4.0-5.0	0.004
Q16	6.0	5.0-6.0	4.0	4.0-5.0	0.002
Q17	6.0	6.0-7.0	5.0	5.0-6.0	0.020
Q18	6.0	6.0-6.0	5.0	4.0-6.0	0.016
Q19	6.0	6.0-6.5	4.0	4.0-5.0	0.002
Q20	6.0	5.5-6.0	4.0	3.5-4.0	0.001
Q21	6.0	5.5-6.0	4.0	4.0-5.0	0.008
Q22	6.0	5.0-6.0	5.0	4.0-5.0	0.008
Q23	6.0	5.0-6.0	4.0	3.5-4.5	0.006
Q24	5.0	5.0-6.0	4.0	3.5-4.5	0.012
Q25	6.0	5.0-6.0	5.0	4.5-5.5	0.016
Q26	5.0	5.0-6.0	4.0	3.0-4.0	0.039

Wilcoxon signed rank test, Abbreviations: TCCNI-Repract, Technological Competency as Caring in Nursing Instrument - Revised and Practice; —, missing value; IQR, Interquartile Range; Bold values significant at $p < 0.05$

DISCUSSION

Caring and psychiatric nursing

In this survey, using the TCCNI-RePract, it was found that the overall perception of Technological Competency as Caring in Nursing by nurse managers in the psychiatric nursing area was high. In comparison, responses to the practice component showed low results. Additionally, significant differences were observed in many items revealed through the Wilcoxon's signed rank sum test, suggesting that the subjects in this study were highly perceptive of the TCCN theory but did not or could not practice adequately using the TCCN theory. This finding was similar to previous studies that investigated the perception and practice of TCCN theory among nurses in acute and general wards (Kato et al., 2017; Nakano, Yokotani, Betriana, et al., 2021; Nakano, Yokotani, Tanioka, et al., 2021; Yokotani et al., 2021).

In particular, Q6 of the perception dimension showed that, "Nurses must make a plan of care together with the patient to ensure quality nursing" had high mean but median values. However, Q6 of the practice dimension, ("I am making care plans together with the patient to ensure quality care") had

the lowest mean and median values within the 2.0s. This suggests that the importance of care planning with patients who have had to be hospitalized for mental illness is recognized but not put into practice. This was considered as the current situation where advanced technical skills in psychiatric nursing, such as advanced communication skills, empathy, and compassionate attitudes (Sanz-Osorio et al., 2023), were shown not able to be sufficiently demonstrated in dealing with the unique symptoms of patients with mental illnesses and to be guided on how to deal with them.

Nurses involved in psychiatric nursing often experience difficulties in dealing with patients (Seto et al., 2020). These include dealing with acute psychiatric symptoms, changing patient expectations, and aggressive behavior from the patient (Pekurinen et al., 2017; Salberg et al., 2019). Psychiatric nursing requires individualized care and comprehensive responses to patients due to the diversity of mental illness classifications and symptoms (Coombs, Crookes, et al., 2013; Coombs, Curtis, et al., 2013). In addition, in order to practice them, nurses engaged in psychiatric nursing need a high level of expertise, as they

must have the ability to provide support based on a great deal of knowledge, skills, and reasonable accommodation (Yamada et al., 2022). Furthermore, some nurses feel moral distress because they are forced to make ethical decisions and subject their patients to extraordinary restrictions that they do not want in the therapeutic environment they provide for the safety of their patients (Jansen et al., 2021; Ohnishi et al., 2018). As a result, nurses engaged in psychiatric nursing have reported feeling frustrated and helpless about these problems (Ando & Kawano, 2016). Nurses' caring behavior is influenced by several environmental factors, including working conditions, workload, management support, and patient health concerns (Akansel et al., 2021). To practice nursing based on the TCCN theory, it is urgent to address personal and environmental factors that align with the clinical setting.

Advances in technology and the need for technological competency in psychiatric nursing.

In a previous study, psychiatric nurses were positive about the implementation of an Internet technology-based support system for depressed patients but did not incorporate it into their daily nursing practice (Kurki et al., 2018). In mental health services, factors that have been identified as hindering the implementation of new interventions include staff and middle management resistance, poor communication, and novelty (Barak & Grohol, 2011). From this, it can be inferred that some barriers may exist regarding technology-enhanced nursing practice. In addition, technology-enhanced work environments have been shown to positively impact practice by enabling nurses to rapidly perceive the care needed for their patients and make changes to their care (Burkoski, 2019). Using such technology-enhanced work environments in clinical psychiatric nursing is considered a practical approach for psychiatric nurses to improve the quality of care. The COVID-19 pandemic has underscored the increased importance of providing physical care support to psychiatric inpatients (Williams et al., 2021). Quantitative antigen tests and polymerase chain reaction tests are currently proving effective in controlling nosocomial Covid-19 infections (Russ et al., 2022). Also, various laboratory techniques, including X-ray and CT scans, contribute to patient safety and comfort by enabling healthcare professionals to detect pneumonia. These results assist nurses in accurately assessing the patient's condition and planning appropriate care (Li et al., 2020; Wang et al., 2022). Recognizing these technologies is important for enabling psychiatric nurses to implement them in the care of psychiatric inpatients (Foye et al., 2021).

In psychiatry, medication and rehabilitation therapy play crucial roles in promoting patients' therapeutic recovery. Advanced technology is used in the development of various psychotherapeutic agents, and a comprehensive understanding of their pharmacological effects can lead to appropriate symptom management for patients with psychiatric disorders (Pearson et al., 2018). Parkinson's syndrome and sarcopenia are commonly observed in patients with psychiatric disorders, which can result in reduced motor function and lower quality of life. Rehabilitation and nutritional therapy are important in preventing these conditions, as well as technical interventions and assessments to support these treatments (Ashdown-Franks et al., 2019; Kowalska et al., 2019; Pearsall et al., 2014). Using these technologies and implementing them effectively in nursing practice allows psychiatric nurses to have a holistic understanding of their patients. Locsin uses Carper's theory in Locsin's TCCN theory. Carper (1978) suggests that fundamental patterns of knowing in nursing - personal, empirical, ethical, and aesthetic- are necessary to understand

a person holistically. Nurses must have advanced technical skills and competencies to implement these types of knowledge in practice. Locsin (2005) states that competence is the ultimate expression of caring in nursing and that the absence of technical ability is tantamount to the absence of caring.

In Japan, the "Program Medical Device and Medical Management Addition" was introduced in the medical fee revision for the fiscal year 2022 (Ministry of Health Labour and Welfare, 2022). Before this revision, nicotine addiction treatment apps and hypertension treatment support apps were approved by the Ministry of Health, Labour, and Welfare, with nicotine addiction treatment apps being covered by insurance (Ministry of Health Labour and Welfare, 2022). In the area of psychiatry, there have been significant advancements in the development of treatment and care using various technologies, including rehabilitation for patients with schizophrenia and dementia, and research on the use of communication robots to alleviate psychiatric symptoms (Osaka et al., 2021, 2022; Tanioka, Betriana, et al., 2021; Tanioka, Yokotani, et al., 2021). These developments may ultimately lead to insurance coverage for non-pharmacological treatments in the psychiatric area. The development of such technology in the psychiatric area relies heavily on the presence of highly skilled psychiatric nurses. To achieve this, it is believed that support must be enhanced to remove the barriers between technology and psychiatric nursing.

In-service education on the TCCN theory in psychiatric nursing

The TCCN theory suggests that nurses can establish closer relationships with patients by improving their technological competency and getting to know them better. The use of technology in nursing is driven by the contemporary demand for nursing practices that require technological knowledge and skills. Therefore, mutual support between the patient, who is the focus of care, and hospital nurses, who play a central role in providing care, is essential. Furthermore, barriers exist at the organizational, practitioner, and educational levels regarding nurses' caring behaviors (Pashaeypoor et al., 2019). However, Brewer et al., (2020) state that attention to nursing practice focused on reducing professional patient self-care levels guided by theory can reduce some of the negative effects of barriers and work environments. In making this possible, nurse managers, leaders, and educators play an important role in creating excellent nursing care. Nurse managers can expect to improve patient satisfaction and nurses' sense of purpose by intervening to help nurses focus on the satisfaction they derive from caring.

Nurse managers should help nurses optimize the use of technology in nursing by providing technology assistance and opportunities for nurses to use technology and by providing training and education on the specific technologies used in psychiatric areas. Nurse managers must understand the nurse's and patient's perspectives on the impact of technology on the delivery of care, which is critical to meeting the patient's spiritual, psychological, and social needs. Moreover, nurse managers have a role in helping nurses distinguish between technology that enables good care and technology that is a burden on care (Burkoski, 2019).

The use of in-service education programs based on the TCCN is expected to become a practical approach to incorporating new technologies into quality psychiatric care in the future. In-service education programs for nursing staff

take many forms and methods (Chaghari et al., 2017). However, there are few reports on its impact, particularly on professional outcomes. In-service education for psychiatric nurse managers focuses on learning the theoretical basis of nursing from TCCN theory. Psychiatric nurse managers are expected to serve as role models for nursing practice based on TCCN theory in order to improve the quality of nursing care. In addition, psychiatric nurse managers are expected to act as experts in nursing practice by implementing the nursing process based on TCCN theory, which involves "knowing the person as caring." As a result, this hierarchical educational plan is expected to systematically enhance competence in care skills, as an expression of caring in nursing, and ultimately improve the quality of nursing care.

The findings of this study are limited as it was conducted only with nurse managers at a single psychiatric hospital. To generalize these findings, it is necessary to conduct similar surveys with a larger number of participants in multiple psychiatric hospitals in the future.

CONCLUSION AND RECOMMENDATION

Nurse managers demonstrated a high level of perception of the TCCN theory; however, many practical items scored low. In order for nurses to practice based on the TCCN theory, it is important to first identify why they are unable to practice on items where the practical score is lower than the perception score. Additionally, nurse managers need to develop a current education program for nursing staff in order to practice based on the TCCN theory. It is also necessary to establish evaluation criteria based on the TCCN theory to measure the effectiveness of current education and develop a sustainable in-service education system.

DECLARATION OF CONFLICT OF INTERESTS

The authors declare that they have no conflicts of interest.

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DATA AVAILABILITY

The datasets generated during and/or analyzed during the current study are not publicly available due to ethical restrictions but are available from the corresponding author upon reasonable request.

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