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PSYCHIATRIC NURSE SELF-EFFICACY SCALES

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Validity and Reliability of Psychiatric Nurse Self-Efficacy Scales: Cross-Sectional Study

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ABSTRACT

Objective: To develop the Psychiatric Nurse Self-Efficacy Scales, and to examine their reliability and validity.

Design: We developed the Improved Self-Efficacy Scale and Decreased Self-Efficacy Scale using existing evidence. Statistical analysis was conducted on the data to test reliability and validity.

Setting: The study's setting was psychiatric facilities in three prefectures in Japan.

Participants: Data from 514 valid responses were extracted of the 786 psychiatric nurses who completed the questionnaires.

Outcome measures: The study measured the reliability and validity of the scales.

Results: The Improved Self-Efficacy Scale has two factors ("Positive changes in the patient" and "Prospect of continuing in psychiatric nursing") and the Decreased Self-Efficacy Scale has three ("Decrease in nursing ability due to overload," "Devaluation of own role as a psychiatric nurse," and "Difficulty in seeing any results from psychiatric nursing"). Statistical analyses showed the scales to be reliable and valid measures.

Conclusions: The ISES and DSES can be effectively used to inform interventions for improving psychiatric nurses' self-efficacy. The newly developed ISES and DSES can accurately assess psychiatric nurses' self-efficacy.

Keywords: psychiatric nursing, self-efficacy, mental health

STRENGTHS AND LIMITATIONS OF THE STUDY

- The first useful scales that measured psychiatric nurses' self-efficacy were developed in this study.
- The content and language of the scale items were carefully selected by

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specialists.

- Scale items were carefully selected by confirming the distribution and the discrimination power of item scores

- Sales have been verified the reliability as the internal consistency, and the factorial, concurrent and convergent validity.

- Scale has not been validated for the cross validation and the test-retest reliability.

INTRODUCTION

Nursing is perceived as a stressful occupation,[1, 2] including psychiatric nursing,[3] with urgent mental health issues that need to be addressed.[4, 5] The average duration of hospitalization for psychiatric patients in Japan is one of the longest worldwide, averaging 265.8 days—although, this has been decreasing in recent years.[6] The Japanese government is now shifting the focus of psychiatric care from the hospital ward to the community, although it is difficult to know how quickly this change is being implemented. Psychiatric nurses need to respond to the drastically different working environment in psychiatric wards, compared to general wards, and the situation-specific difficulties encountered by psychiatric nurses, such as communication difficulties related to mental issues and violence from psychiatric patients. The necessity of specialized mental healthcare for psychiatric nurses has been emphasized.[7] McVicar[8] conducted a scoping review to assess the antecedents of nurses' job stress and satisfaction. Yada et al.[7] clarified the characteristics of job stress among psychiatric nurses when evaluating their mental health. Yada et al.[9] also highlighted the importance of self-efficacy and job stress evaluating psychiatric nurses' mental health.

Bandura[10] defined self-efficacy as "judgment of how well one can execute courses of action required to deal with prospective situations" (p. 122); individuals with high self-efficacy set their own goals, while those with low self-efficacy may produce poor outcomes.[11] Self-efficacy affects workers' efforts and sustainability in learning difficult tasks.[12] Self-efficacy may also partially buffer stress,[13] and should not only be considered a part of mental healthcare but also as a factor to improve the quality of patient care. To improve the self-efficacy of psychiatric nurses, it first needs to be evaluated. Existing self-efficacy scales are inadequate, due to their lack of focus on the

specific issues and environmental contexts encountered by psychiatric nurses. It is

essential to develop scales that evaluate self-efficacy and stress among psychiatric

nurses specifically.

Many studies to evaluate the self-efficacy of healthcare professionals, including

nurses, have been conducted using Sakano and Tohjoh's[14] General Self-Efficacy

Scale (GSES).[15] Bando et al.[16] devised a self-efficacy scale for psychiatric nurses

that takes their relationships with their patients into consideration. However, self-

efficacy scales for psychiatric nurses should include factors such as uncertainty and role

loss and should not be limited to patient relationships.[9] Devising a comprehensive

scale to evaluate the self-efficacy of psychiatric nurses, which is not found in the

conventional GSES[14] and patient-related self-efficacy scale,[16] will facilitate the

planning of specific mental healthcare interventions for psychiatric nurses. In Japan,

there are about 82,000 full-time nurses working in psychiatric departments,[17] and this

cohort can be used for research that contributes to improving their quality of mental

healthcare, thus improving patient care.

This study aimed to develop Psychiatric Nurse Self-Efficacy Scales (PNSS) to

evaluate psychiatric nurses' feelings of self-efficacy, which is difficult to grasp with

existing scales, and to examine the reliability and validity of these developed scales.

METHODS

Participants and Procedure

The study adopted a cross-sectional survey design. The principal researcher

requested the cooperation of 11 heads of nursing departments in psychiatric facilities in

three prefectures. They gave written and verbal consent to distribute anonymous, self-

administered questionnaires to nurses in their departments. A total of 514 valid

responses with no missing values for scale scores were extracted from the 786

questionnaires completed by registered and associate nurses from January to March

2020. Participants provided written informed consent and were informed that they could

freely withdraw from the survey. They did not receive any compensation or rewards.

Each participant was given an envelope in which to seal their questionnaires to protect

their privacy. Participation was anonymous, and only the researcher could access the

data. This study was approved by the Ethics Review Board of Yamaguchi University

Graduate School of Medicine, School of Health Sciences (approval no. 605-2).

Patient and Public Involvement

No patients were involved with this study as it pertained to psychiatric nurses

only.

Measures

General demographic data (age, sex, job position, qualifications, years of

experience as a nurse, experience working in a psychiatry department, and nursing

education level) were collected. The initial PNSS included 52 items assessing factors

related to self-efficacy, based on previously determined qualitative data on psychiatric

nurses' self-efficacy.[18] Two researchers with experience in psychiatric nursing and

two with experience as clinical psychologists reviewed the data and developed the

question items. Forty-nine meaningful items from Yada et al.[18] were used to create

the 52 items. The accuracy of item expression was discussed by four researchers—two

psychology and two psychiatric nursing faculty members.

Participants' responses were rated on an 11-point scale from 0 (Not at all) to 10

(Yes), with higher scores indicating higher self-efficacy. The initial PNSS comprised

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the Improved Self-Efficacy Scale (ISES; 26 items) and Decreased Self-Efficacy Scale

(DSES; 26 items), which were separately analyzed

The GSES was used to assess concurrent validity; its reliability and validity

have been established.[14] It comprises 16 items rated on a 2-point scale, 0 (No) and 1

(Yes); higher scores indicate higher self-efficacy. Cronbach's alpha coefficient was

0.849. Permission to use the GSES was obtained from Cocolonet Co., Ltd.

Self-efficacy reduces stress conditions.[13] The stress reaction scale (SRS) in

the Brief Job Stress Questionnaire Short version was used to assess the convergent

validity of the PNSS; its reliability and validity were previously established.[19] The

SRS evaluates psychological stress and physical stress reactions and comprises 11 items

rated on a 4-point Likert scale ranging from 0 (Not at all) to 3 (Definitely); higher

scores indicate higher stress reactions. Cronbach's alpha coefficient in this study was

0.929. Permission to use the SRS was obtained from the Japanese Ministry of Health,

Labor and Welfare.

Statistical Analyses

Means, standard deviations (SD), frequencies (n), and percentages (%) were

calculated for participants' demographic characteristics. For item analyses, kurtosis,

skewness, ceiling effect, and floor effect were confirmed by observing their distribution

on the 52 items (26 ISES item scores and 26 DSES item scores) in the initial version of

the PNSS. Item discrimination was confirmed by ANOVA (low, middle, and high

group) as a good-poor (G-P) analysis. The PNSS factor structure was identified using

exploratory factor analysis (EFA). For reliability, the internal consistency of the factors

was calculated using Cronbach's alpha coefficient. Factor structure validity was

confirmed by confirmatory factor analysis (CFA). The following values are considered

good for each good index: χ^2/df ratio from 2.0 to 3.0, goodness of fit index (GFI) > .90, adjusted goodness of fit index (AGFI) > .85, comparative fit index (CFI) > .95 and root mean square error of approximation (RMSEA) < .08.[20] For concurrent and convergent validity, Pearson's correlation coefficients were calculated to confirm correlation between the PNSS and the GSES and SRS factor structures.

The evaluation score was developed by ±SD. Concretely, −1.5 SD ≧ is low, -0.5 SD < to −1.5 SD > is low tendency, -0.5 SD ≦ to ＋0.5 SD ≧ is normal, 0.5 SD < to 1.5 SD > is high tendency, and 1.5 SD ≦ is high. Evolution scores were set for each scale and subscale score. The significance level was set at $p < .05$. IBM SPSS version 24.0 for Windows was used for the item analysis, EFA, calculation of reliability, and calculation of convergent and predictive validity. IBM AMOS version 24.0 for windows was used for the CFA.

Sample Size

The main analysis used was factor analysis. If communalities are low, and there are a larger number of factors (more than 3 or 4), a sample size of more than 500 is likely to be required.[21] We required a sample size of over 500, and our sample met that requirement with 514 valid responses.

RESULTS

Demographics

Responses were received from 689 participants (recovery rate = 87.66%), with 514 valid responses (effective response rate = 74.60%).

Participants' mean age was 44.76 years ($SD = 11.30$). The mean years of nursing experience was 18.82 years ($SD = 11.56$). The mean years of experience of

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psychiatry department was 13.20 years (SD = 9.93). There were 189 men (36.8%), 324 women (63.0%), and 1 left this unanswered (0.2%). There were 29 university/college graduates (5.6%), 26 junior nursing college graduates (5.1%), 454 nursing school graduates (88.3%), and 5 left this unanswered (1.0%). There were 406 registered nurses (79.0%), 106 associate nurses (20.6%), and 2 left this unanswered (0.4%). Regarding job positions, 93 were managers as nursing director, head nurse and chief nurse (18.1%), 416 were non-managers (80.9%), and 5 left this unanswered (1.0%).

Item Analysis

Kurtosis and skewness were not detected within ± 2 in the 52-item distribution of scores.[22] Discriminations for the 52 items were confirmed by a good-poor (G-P) ANOVA and all items were significant. Item discrimination was confirmed for all items. No ceiling or floor effect was detected within ± 1 SD in the 52-item distribution of scores.

Factor Structure of the PNSS

Items with communality less than 0.2 were excluded from subsequent analysis.[23] The factor structure of the PNSS was identified using EFA. In the process of conducting EFA, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was confirmed. The principal factor method was used in the extraction of factors and promax rotation was conducted. The scree test[24] was used to decide the number of factors. A factor loading of more than 0.5, which is more factor related, was adopted.[25] Factor names were determined and discussed by four researchers—two psychology and two psychiatric nursing faculty members.

For the ISES, three items with less than communality 0.2 were excluded from EFA.[23] The KMO measure of sampling adequacy was 0.910, showing that EFA was

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appropriate.[26] Two factors with 11 items were extracted: 1) "Positive changes in the patient" with 6 items, including items related to those changes as recognized by the nurse. 2) "Prospect of continuing in psychiatric nursing" with 5 items, including items related to experiences of failure and trust and the ability to persevere with nursing.

For the DSES, four items with communality less than 0.2 were excluded from EFA.[23] The KMO measure of sampling adequacy was 0.866, showing that EFA was appropriate.[26] Three factors with 12 items were extracted: 1) "Decrease in nursing ability due to overload" with five items, including items related to the deterioration of nursing ability in various situations. 2) "Devaluation of own role as a psychiatric nurse" with three items, including items that made nurses feel underappreciated. 3) "Difficulty in seeing any results from psychiatric nursing" with four items, including items that make nurses feel their interventions have little effect on patients.

Tables 1 and 2 show the EFA results; Japanese-English translation-reverse translation was performed by translators, and agreement between languages confirmed.

Table 1. *The factor structure for improved self-efficacy among psychiatric nurses*

No	Content of items	F1	F2	Communality
Factor 1: Positive changes in the patient (Cronbach's α= .839)				
33	**I feel that I can get words of appreciation from patients by being considerate.**	**.880**	-.205	.608
35	**I feel that I can get words of thanks from patients.**	**.778**	-.178	.472
27	**I feel that considerate makes smile of patients.**	**.767**	-.116	.494
31	**I feel that there are happy figures of patients.**	**.695**	-.011	.477
29	**I feel that there are figures of patient's satisfaction.**	**.576**	.065	.385
41	**I feel that the patient's mind is disclosed.**	**.533**	.149	.404
3	I feel that my involvement with the patient is helpful to my life experience.	.489	.119	.319

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No	Content of items			
43	I feel that a passive patient's mind is disclosed.	.476	.123	.314
45	I feel the building of a relationship of trust with patients.	.457	.350	.518
15	I can see healthy patients after leaving the hospital.	.420	.117	.250
37	I feel that patients are active for rehabilitation.	.329	.120	.171
25	I feel the patient's symptoms are stable.	.314	.304	.308
5	I feel that the training is helpful.	.307	.220	.224
Factor 2: Prospect of continuing in psychiatric nursing (Cronbach's α= .809)				
9	**I can forecast prospects for the patient's symptoms.**	-.191	**.867**	.598
11	**I can foresee nursing.**	-.060	**.819**	.619
7	**I feel that I can make a right nursing decision.**	-.163	**.730**	.415
1	**I can make use of my own experience of failure.**	.006	**.558**	.306
47	**I feel trust from the same nurses.**	.106	**.505**	.337
21	I can reduce the patient's anxiety by giving advice.	.228	.456	.377
39	I feel that the patients understand my explanation.	.367	.399	.460
19	I can alleviate the patient's anxiety by listening to the patient's complaints.	.256	.398	.337
23	I can improve the patient's rejection of medicine.	.133	.383	.221
17	I can see a change in the behavior of a passive patient.	.310	.331	.330
Scale score total (Cronbach's α= .845)				
	Correlation of factors			
	Factor 1	1.000		
	Factor 2	.589	1.000	

Note. Bold font indicates the items that comprise the factors.

Table 2. *The factor structure for decreased self-efficacy among psychiatric nurses.*

No	Content of items	F1	F2	F3	Communality
F1: Decrease in nursing ability due to overload (Cronbach's alpha = .694)					
34	**I feel that nursing care is increasing due to the aging of patients.**	**0.584**	-0.214	0.034	.349
28	**I feel a risk of violence from patients.**	**0.560**	-0.009	0.107	.341
30	**I come across the excitement of**	**0.538**	0.104	-0.015	.291

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	patients.				
32	**I feel a decline in my ability to judge due to being busy.**	**0.515**	0.392	-0.216	.461
36	**I feel that I have little interaction with patients because of other work.**	**0.510**	0.244	-0.160	.355
26	I feel a relapse of the patient's mental illness.	0.484	-0.145	0.228	.331
40	I find it difficult to show evidence.	0.355	0.083	0.044	.192
10	I feel that I'm repeating the same explanation to the patient.	0.319	0.104	0.203	.254
F2: Devaluation of own role as a psychiatric nurse (Cronbach's α= .655)					
44	**I feel that patients don't need me.**	-0.228	**0.651**	0.121	.430
52	**I have lost my confidence in my attitude toward nursing.**	0.137	**0.605**	-0.005	.440
46	**I feel that patients don't need me.**	0.048	**0.528**	-0.068	.271
16	I meant well action for the patient but it was a disappointing action for me.	-0.112	0.432	0.367	.390
50	I have forgotten greeting patients with the passage of time.	0.053	0.430	0.060	.200
6	I feel that even if I make a promise, the patient refuses.	0.027	0.416	0.276	.352
8	I feel bad communicating with patients.	0.112	0.385	0.146	.261
48	I feel a lack of physical strength.	0.239	0.338	-0.057	.206
F3: Difficulty in seeing any results from psychiatric nursing (Cronbach's alpha = .737)					
14	**I don't feel the effectiveness of the care given to patients.**	0.193	0.143	**0.633**	.361
12	**I feel there is no improvement in the patient's symptoms.**	0.053	0.078	**0.601**	.414
20	**I feel ambiguity about the treatment effect.**	0.077	0.063	**0.586**	.414
18	**I feel vague about the patient's symptoms.**	0.113	0.041	**0.502**	.356
22	I feel that there are patients who are uncooperative for treatment.	0.395	-0.146	0.481	.483
4	I feel that there are patients who do not	0.316	-	0.407	.354

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participate to the treatment.		0.137		
Scale score total (Cronbach's alpha = .773)				
Correlation of factors				
Factor 1	1.000			
Factor 2	.331	1.000		
Factor 3	.472	.386	1.000	

Note. Bold font indicates the items that comprise the factors.

Reliability of the PNSS

To determine the ISES and DSES reliability, we calculated Cronbach's alpha coefficient for each scale and subscale (Tables 1 and 2). Cronbach's alpha coefficient was .839 for "Positive changes in the patient," .809 for "Prospect of continuing in psychiatric nursing," .845 for the overall ISES, .694 for "Decrease in nursing ability due to overload," .655 for "Devaluation of own role as a psychiatric nurse," .737 for "Difficulty in seeing any results from psychiatric nursing," and .773 for the overall DSES.

Validity of the PNSS

For factorial validity, the compatibility of the extracted factors was analyzed by CFA. For the ISES, the results followed the goodness of fit model: χ^2/df (292.87/43) ratio = 6.81 ($p < .01$), GFI = .897, AGFI = .842, CFI = .888, RMSEA = .106 and Akaike Information Criterion (AIC) = 338.87. The goodness of fit was not high; therefore, we assumed there were correlations among error variables in a factor, based on the modification index, and developed a revised model to fit the data. Paths were created between error variables, yielding the following results: χ^2/df (110.625/37) ratio = 2.990 ($p< .001$), GFI = .962, AGFI = .932, CFI = .967, RMSEA = .062, and AIC = 168.625 (Figure 1). For the DSES, the results followed the goodness of fit model: χ^2/df (243.157/51) ratio = 4.768 ($p < .001$), GFI = .928, AGFI = .890, CFI = .854, RMSEA

= .086, AIC = 297.157. The goodness of fit was not high, therefore, we assumed there

were correlations among error variables in a factor, based on the modification index,

and developed a revised model to fit the data. Paths were created between error

variables, yielding the following results: χ^2/df (120.859/46) ratio = 2.627 ($p < .001$),

GFI = .963, AGFI = .938, CFI = .943, RMSEA = .056, and AIC = 184.859 (Figure 2).

[Figure 1 near here]

[Figure 2 near here]

To determine the concurrent and convergent validity of the ISES and DSES,

the correlation coefficient with external variables was calculated for each scale and

subscale score. In consideration of the concurrent validity, the GSES was used as an

external variable. The correlation coefficient ranged from .149 to .446 ($p < .001$)

between the ISES and each ISES subscale score and the GSES score, indicating a weak-

medium correlation. The correlation coefficient ranged from -.174 to -.462 between the

DSES and each DSES subscale score and the GSES score, indicating a weak-medium

correlation. In consideration of the convergent validity, the SRS was used as an external

variable. The correlation coefficient ranged from -.128 to -.161 ($p < .001$) between the

ISES and each ISES subscale score and the SRS score, indicating a weak correlation.

The correlation coefficient ranged from .262 to .405 between the DSES and each DSES

subscale score and the SRS score, indicating a weak-medium correlation. Table 3 shows

the results of concurrent and convergent validities.

Table 3. *The PNSS and the GSES, the SRS and the intention to continue working*

correlations

	The GSES	The SRS
Positive changes in the patient	.149*	-.128*

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Prospect of continuing in psychiatric nursing	.446[*]	-.143[*]
Improved Self-Efficacy Scale total	.333[*]	-.161[*]
Decrease in nursing ability due to overload	-.205[*]	.262[*]
Devaluation of own role as a psychiatric nurse	-.462[*]	.398[*]
Difficulty in seeing any results from psychiatric nursing	-.174[*]	.272[*]
Decreased Self-Efficacy Scale total	-.355[*]	.405[*]

Note. *p < .001; PNSS: Psychiatric Nurse Self-Efficacy Scales; GSES: General Self-Efficacy Scale; SRS: Stress Reaction Scale.

DISCUSSION

This study examined the development and usefulness of a scale to comprehensively evaluate psychiatric nurses' self-efficacy.

Participants' Characteristics

The basic attributes in a previous study among 577 Japanese psychiatric nurses [27] were as follows: for age (years), 34.7% were in their 40s, 27.4% in 50s, and 17.7% for 30s; for gender 23.1% were men and 76.9% were women; for mean experience within the psychiatry department (years) 29.6% had 10 years ≥ 20 years, 25.8% had 3 years ≥ 10 years, and 19.6% had 20 years ≥ 30 years. Moreover, 18.4% worked as managers above chief nurse and 79.0% as staff nurses. In comparison with participants in this study, mean age ± SD is 44.76 ± 11.30 years, 36.8% were men and 63.0% women, while mean experience in the psychiatry department ± SD was 13.20 ± 9.93 years, and the job position for 18.1% was managers of chief nurse and above and for 80.9% was staff nurse. The distribution of age, years of psychiatric experience, and job title seemed to be roughly the same, but the proportion of males in this study was higher than that in previous studies. As a basic attribute of 132 Japanese psychiatric nurses in

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the previous study,[9] the education level of the study participants was 84.8% for nursing school and 8.3% for university. It seemed to be in rough agreement with 88.3% for nursing school and 5.6% for university/college in our study.

ISES Analysis

The factor "Positive changes in the patient" was similar to that of "Positive reaction of patients," one of the factors of self-efficacy revealed in Yada et al.'s[9] study. Patience is required to treat psychiatric symptoms. Drug therapy and psychotherapy are less effective for treating the negative symptoms of schizophrenia, and long-term interventions by skilled specialists are required for this purpose.[28] In such situations, psychiatric nurses may experience improved self-efficacy, when they see positive changes in the patient.

The factor "Prospect of continuing in psychiatric nursing" was found to have a different meaning than that revealed in a previous study.[9] The problem of moral distress in psychiatric nursing fields has been discussed both inside and outside of Japan.[29, 30] However, there are no instant measures for feelings of moral distress. Nurses gain the trust of their colleagues and themselves over time, and trust may lead to a stronger feeling of self-efficacy.

DSES Analysis

The factor "Decrease in nursing ability due to overload" was found to have a different meaning to that found in a previous study.[9] The responsibilities of psychiatric nurses include not just patient care but also lots of administrative work. One survey of psychiatric nurses found that 2.18 minutes were spent on symptom management, while two hours were spent on the related paperwork, and nurses who spent more time on direct patient care were more satisfied.[31] When psychiatric nurses

are unable to spend enough time on patient care, they may feel that they are not

providing sufficient care, which may lead to reduced feelings of self-efficacy.

The factor "Devaluation of own role as a psychiatric nurse" was similar to

"Nurse's loss of role."[9] About half of Japanese psychiatric home-visiting nurses

experience violence from their patients, especially verbal violence, and some nurses are

at risk of post-traumatic stress disorder.[32] According to previous research, when

volunteers feel threatened by people with mental health problems, it can lead to a

deterioration of social distance between volunteers and people with mental health

problems.[33] Similarly, when psychiatric nurses experience patient violence, they may

feel threatened and unable to care for the patient any longer, which can lead to a feeling

of decreased self-efficacy due to the loss of their role.

The factor "Difficulty in seeing any results from psychiatric nursing" was

similar to "Uncertainty about psychiatric nursing."[9] As discussed, the average length

of stay for Japanese psychiatric patients is much longer than in other countries,[6] and

deinstitutionalization is evolving slowly. One-third of patients admitted to Japan's

psychiatric wards in 2017 were 75 and over.[34] Elderly people often experience two or

more chronic illnesses[35] which, in combination with psychiatric illnesses, may not be

completely curable, and psychiatric nurses may feel they do not achieve any results

from their care and thus experience feelings of lower self-efficacy.

Reliability and Validity of Scales

To prove the reliability of subscales and scales, Cronbach's alpha should

exceed .60, and scores greater than .95 indicate redundancy.[36] A previous study

indicated that "An alpha coefficient of 0.70 has often been regarded as an acceptable

threshold for reliability; however, 0.80 and 0.95 is preferred for the psychometric

quality of scales."[37] The internal consistencies of some subscale may be not

unacceptable, but not enough. As mentioned above, some of the factor structures related

to the self-efficacy of psychiatric nurses in our previous study[9] were similar to those

in this study. However, unlike the current findings, most of the previous studies

reported high internal consistencies. Therefore, this decrease in Cronbach's α coefficient

may be due to sample differences, and thus, future research is needed.

The factorial validity and goodness of fit indices were confirmed for ISES and

DSES. Each value of the revised model for the ISES and the DSES exceeded

indices,[20] indicating acceptable goodness of fit. For convergent and predictive

validity, the ISES and the DSES showed a weak-medium significant correlation

between the GSES and the SRS. The ISES and the DSES were judged to be measures

that can evaluate self-efficacy and associated stress.

The Future of Psychiatric Nurses' Mental Health

The ISES factors "Positive changes in the patient" and "Prospect of continuing

in psychiatric nursing," and the DSES factors "Decrease in nursing ability due to

overload," "Devaluation of own role as a psychiatric nurse," and "Difficulty in seeing

any results from psychiatric nursing" were developed in the current study. Self-efficacy

is recovered through resilience,[38] so it was necessary to confirm how resilience can

control "Positive changes in the patient," "Prospect of continuing in psychiatric

nursing," "Decrease in nursing ability due to overload," "Devaluation of own role as a

psychiatric nurse," and "Difficulty in seeing any results from psychiatric nursing" for

psychiatric nurses' future mental healthcare.

Future Avenues for This Research

This scale requires further examination for reliability and validity among

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different samples to determine its cross validation and predictive validity. Moreover,

future studies are also needed to validate the test-retest reliability.

Study Limitations

Some limitations of the present study are that there were more male participants

than in previous studies, which may be due to selection bias. The standard scores were

calculated from the data of this study, so the results are not absolute indices; follow-up

studies are required.

CONCLUSIONS

In this study, the ISES factors "Positive changes in the patient" and "Prospect of

continuing in psychiatric nursing" and the DSES factors "Decrease in nursing ability

due to overload," "Devaluation of own role as a psychiatric nurse," and "Difficulty in

seeing any results from psychiatric nursing" were developed for the PNSS. Reliability

and validity analyses indicated that the ISES and the DSES are useful. Using these

scales, it is possible to formulate programs for improving psychiatric nurses' feelings of

self-efficacy.

Interventions to increase resilience are useful for improving their positive

feelings of self-efficacy and preventing feelings of decreased self-efficacy. It is

necessary to confirm how resilience can control "Positive changes in the patient,"

"Prospect of continuing in psychiatric nursing," "Decrease in nursing ability due to

overload," "Devaluation of own role as a psychiatric nurse," and "Difficulty in seeing

any results from psychiatric nursing" for mental healthcare planning. When measuring

the self-efficacy of psychiatric nurses in intervention studies, scales should be used to

indicate directions for effective mental healthcare. Interventions to increase the

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resilience of psychiatric nurses are useful for improving self-efficacy and preventing feelings of decreased self-efficacy. Improved psychiatric nurse self-efficacy will have positive consequences for patient care.

Conflict of Interest: None.

Author Contributions: HY, RO, KA, HA were involved in study design. HY obtained funding. HY, TF, MF, and TK took part in the investigation. HY, RO, KA, HA, FY, TF, MF, and TK were involved in data analysis and interpretation. All authors critically revised the report, commented on drafts of the manuscript, and approved the final manuscript.

Data Sharing Statement: The data is free for re-use by all other researchers.

Patient consent for publication: Not required.

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Figure 1. Fit indices of the proposed models for the Improved Self-Efficacy Scale (ISES). The ISES was found to fit a two-factor structure with 11 items. χ2/df (110.625/37, *p*< .001): 2.990, Goodness of fit index: .962; Adjusted goodness of fit index: .932, Comparative fit index: .967; Root mean square error of approximation: .062; Akaike Information Criterion: 168.625, F1: Positive changes in the patient, F2: Prospect of continuing in psychiatric nursing.
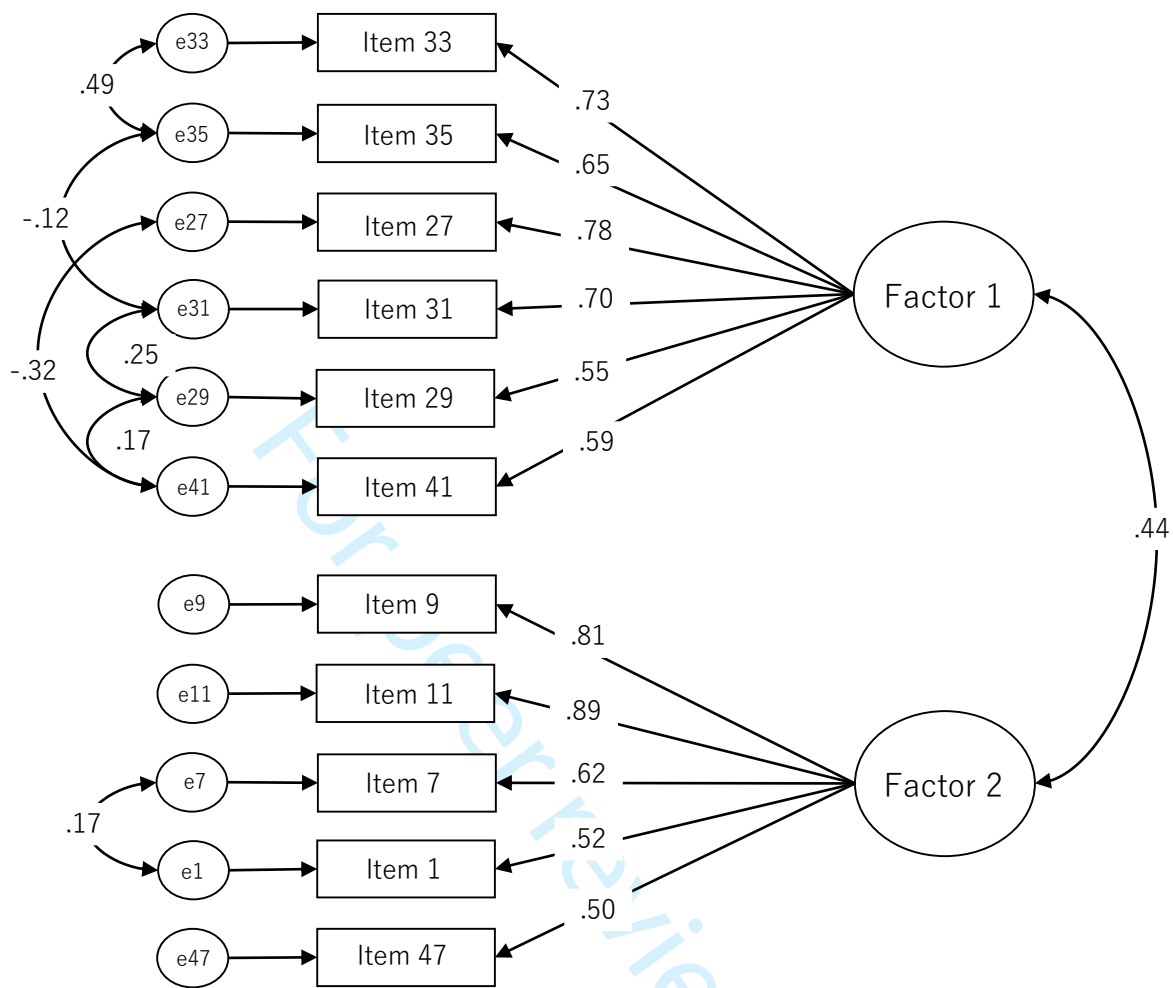
PSYCHIATRIC NURSE SELF-EFFICACY SCALES

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Figure 2. Fit indices of the proposed models for the Decreased Self-Efficacy Scale (DSES). The DSES was found to fit a three-factor structure with 12 items. $\chi 2/df(120.859/46, p< .001)$: 2.627, Goodness of fit index: .963; Adjusted goodness of fit index: .938, Comparative fit index: .943; Root mean square error of approximation: .056, Akaike Information Criterion: 184.859, F1: Decrease in nursing ability due to overload, F2: Devaluation of own role as a psychiatric nurse, F3: Difficulty in seeing any results from psychiatric nursing.
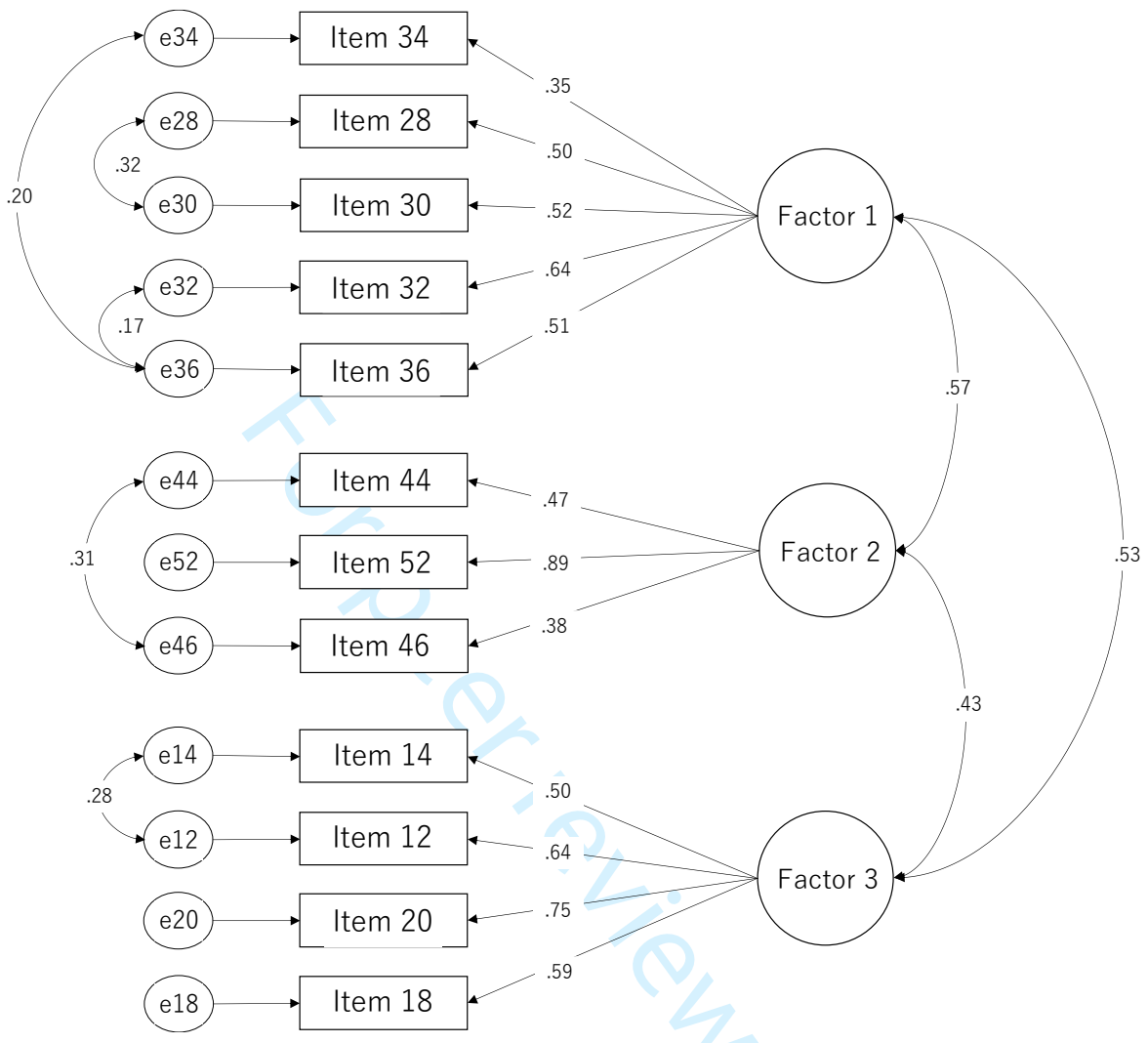
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STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	5
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods			
Study design	4	Present key elements of study design early in the paper	1
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7
Bias	9	Describe any efforts to address potential sources of bias	9
Study size	10	Explain how the study size was arrived at	9
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	-
		(*b*) Describe any methods used to examine subgroups and interactions	-
		(*c*) Explain how missing data were addressed	6
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	9
		(*e*) Describe any sensitivity analyses	-
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	9
		(b) Give reasons for non-participation at each stage	-
		(c) Consider use of a flow diagram	-
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	9
		(b) Indicate number of participants with missing data for each variable of interest	9
Outcome data	15*	Report numbers of outcome events or summary measures	10
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	-

		(*b*) Report category boundaries when continuous variables were categorized	-
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	-
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	-

Discussion

Key results	18	Summarise key results with reference to study objectives	17
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	21
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	17
Generalisability	21	Discuss the generalisability (external validity) of the study results	17

Other information

Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	23

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Validity and Reliability of Psychiatric Nurse Self-Efficacy Scales: Cross-Sectional Study

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PSYCHIATRIC NURSE SELF-EFFICACY SCALES   1

Validity and Reliability of Psychiatric Nurse Self-Efficacy Scales: Cross-Sectional Study

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Word count: 3891

PSYCHIATRIC NURSE SELF-EFFICACY SCALES   3

ABSTRACT

Objectives: To develop the Psychiatric Nurse Self-Efficacy Scales, and to examine their reliability and validity.

Design: We developed the Improved Self-Efficacy Scale and Decreased Self-Efficacy Scale using existing evidence. Statistical analysis was conducted on the data to test reliability and validity.

Setting: The study's setting was psychiatric facilities in three prefectures in Japan.

Participants: Data from 514 valid responses were extracted of the 786 responses by psychiatric nurses.

Outcome measures: The study measured the reliability and validity of the scales.

Results: The Improved Self-Efficacy Scale has two factors ("Positive changes in the patient" and "Prospect of continuing in psychiatric nursing") and the Decreased Self-Efficacy Scale has three ("Devaluation of own role as a psychiatric nurse," "Decrease in nursing ability due to overload," and "Difficulty in seeing any results in psychiatric nursing"). With regard to scale reliability, the Cronbach alpha coefficient was 0.634-0.845. With regard to scale validity, as the factorial validity of the ISES and DSES, for the ISES, χ^2/df (110.625/37) ratio = 2.990 (p< .001), GFI = .962, AGFI = .932, CFI = .967, RMSEA = .062, for the DSES, χ^2/df (101.982/37) ratio = 2.756 (p < .001), GFI = .966, AGFI = .940, CFI = .943, RMSEA = .059, and AIC = 159.982. The concurrent validity of the General Self-Efficacy Scale was r = 0.149 - 0.446 (P < 0.01) for ISES and r = -0.154 - -0.462 (P < 0.01) for DSES, and the concurrent validity of the Stress Reaction Scale was r = -0.128-0.168 for ISES, r = 0.214 – 0.398 for DSES (P < 0.01). Statistical analyses showed the scales to be reliable and valid measures.

Conclusions: The ISES and DSES can accurately assess psychiatric nurses' self-

PSYCHIATRIC NURSE SELF-EFFICACY SCALES   4

efficacy. Using these scales, it is possible to formulate programs for improving

psychiatric nurses' feelings of self-efficacy.

Keywords: psychiatric nursing, self-efficacy, mental health

STRENGTHS AND LIMITATIONS OF THE STUDY

- The first useful scales that measured psychiatric nurses' self-efficacy were
  developed in this study.

- The content and language of the scale items were carefully selected by
  specialists.

- Scale items were carefully selected by confirming the distribution and the
  discrimination power of item scores

- Sales have been verified for the reliability and validity.

- The cross validation and the test-retest reliability will be needed for future study.

INTRODUCTION

Bandura[1] defined self-efficacy as "judgment of how well one can execute courses of action required to deal with prospective situations" (p. 122); individuals with high self-efficacy set their own goals, while those with low self-efficacy may produce poor outcomes.[2] Self-efficacy affects workers' efforts and sustainability in learning difficult tasks.[3] Self-efficacy may also partially buffer stress,[4] and should not only be considered a part of mental healthcare but also as a factor to improve the quality of patient care. Therefore, maintaining self-efficacy has important implications for nurses.

Nursing is recognized as emotional labor. [5, 6] McVicar [7] conducted a scoping review to assess the antecedents of nurses' job stress and satisfaction. Nursing is perceived as a stressful occupation,[8, 9, 10] with urgent mental health issues that need to be addressed.[11, 12] Mental health problems for nurses include conflict with other nursing staff, nursing role conflict, qualitative workload, quantitative workload, and conflict with patients.[13] Nurses working in general wards care for physical illness. The average length of stay in general wards, excluding psychiatry, is 16.1 days.[14]

While, the average duration of hospitalization for psychiatric patients in Japan is one of the longest worldwide, averaging 265.8 days—although, this has been decreasing in recent years.[14] The Japanese government is now shifting the focus of psychiatric care from the hospital ward to the community, although it is difficult to know how quickly this change is being implemented. Psychiatric nurses need to respond to the drastically different working environment in psychiatric wards, compared to general wards, and given the situation-specific difficulties encountered by psychiatric nurses, such as communication difficulties related to mental issues and violence from

psychiatric patients, the necessity of specialized mental healthcare for psychiatric nurses

has been emphasized.[15] At the same time, there is concern that psychiatric nurses

exposed to such an environment may have reduced self-efficacy. Yada et al.[16] also

highlighted the importance of self-efficacy when evaluating psychiatric nurses' mental

health. The factors associated with self-efficacy of psychiatric nurses were "Positive

reactions by patients," "Ability to positively change nurse-patient relationship," and

"Practicability of appropriate nursing," "Uncertainty in psychiatric nursing" and

"Nurses' role loss," represent the reality of psychiatric nurses.[16]

To improve the self-efficacy of psychiatric nurses, it first needs to be evaluated.

Existing self-efficacy scales are inadequate, due to their lack of focus on the specific

issues and environmental contexts encountered by psychiatric nurses. Many studies to

evaluate the self-efficacy of healthcare professionals, including nurses, have been

conducted using Sakano and Tohjoh's[17] General Self-Efficacy Scale (GSES).[18]

Bando et al.[19] devised a self-efficacy scale for psychiatric nurses that takes their

relationships with their patients into consideration. However, self-efficacy scales for

psychiatric nurses should include factors such as uncertainty and role loss and should

not be limited to patient relationships.[16] According to previous studies, [16, 20] there

are multiple factors related to self-efficacy of psychiatric nurses, and it is necessary to

develop a scale corresponding to these factors. Devising a comprehensive scale to

evaluate the self-efficacy of psychiatric nurses, which is not found in the conventional

GSES[17] and patient-related self-efficacy scale,[19] will facilitate the planning of

specific mental healthcare interventions for psychiatric nurses. In Japan, there are about

82,000 full-time nurses working in psychiatric departments,[21] and this cohort can be

used for research that contributes to improving their quality of mental healthcare, thus

improving patient care.

This study aimed to develop Psychiatric Nurse Self-Efficacy Scales (PNSS) to evaluate psychiatric nurses' feelings of self-efficacy, which is difficult to grasp with existing scales, and to examine the reliability and validity of these developed scales.

METHODS

Participants and Procedure

The study adopted a cross-sectional survey design. The principal researcher requested the cooperation of 11 heads of nursing departments in psychiatric facilities in three prefectures. They gave written and verbal consent to distribute anonymous, self-administered questionnaires to nurses in their departments. A total of 514 valid responses with no missing values for scale scores were extracted from the 786 questionnaires completed by registered and associate nurses from January to March 2020. Participants provided written informed consent and were informed that they could freely withdraw from the survey. They did not receive any compensation or rewards. Each participant was given an envelope in which to seal their questionnaires to protect their privacy. Participation was anonymous, and only the researcher could access the data. This study was approved by the Ethics Review Board of Yamaguchi University Graduate School of Medicine, School of Health Sciences (approval no. 605-2).

Patient and Public Involvement

No patients were involved with this study as it pertained to psychiatric nurses only.

Measures

Participant demographics

General demographic data (age, sex, job position, qualifications, years of

experience as a nurse, experience working in a psychiatry department, and nursing education level) were collected.

The PNSS

The initial PNSS included 52 items assessing factors related to self-efficacy, based on previously determined qualitative data on psychiatric nurses' self-efficacy.[20] Two researchers with experience in psychiatric nursing and two with experience as clinical psychologists reviewed the data and developed the question items. Forty-nine meaningful items from Yada et al.[20] were used to create the 52 items. The accuracy of item expression was discussed by four researchers—two psychology and two psychiatric nursing faculty members.Participants' responses were rated on an 11-point scale from 0 (Not at all) to 10 (Yes). The initial PNSS comprised the Improved Self-Efficacy Scale (ISES; 26 items) and Decreased Self-Efficacy Scale (DSES; 26 items),

The ISES and DSES items were separately created based on linguistic data extracted using qualitative research. [20] The ISES examines what improves self-efficacy, and the DSES investigates what reduces self-efficacy. The items between the two scales are completely different. Therefore, the ISES and DSES were separately analyzed. The higher the score for the ISES, the higher the self-efficacy, and the higher the score for the DSES, the lower the self-efficacy.

The GSES

The GSES was used to assess concurrent validity; its reliability and validity have been established.[17] It comprises 16 items rated on a 2-point scale, 0 (No) and 1 (Yes); higher scores indicate higher self-efficacy. Cronbach's alpha coefficient was 0.849. Permission to use the GSES was obtained from Cocolonet Co., Ltd.

The Stress Reaction Scale (SRS)

Self-efficacy reduces stress conditions.[4] The stress reaction scale (SRS) in the

Brief Job Stress Questionnaire Short version was used to assess the convergent validity

of the PNSS; its reliability and validity were previously established.[22] The SRS

evaluates psychological stress and physical stress reactions and comprises 11 items

rated on a 4-point Likert scale ranging from 0 (Not at all) to 3 (Definitely); higher

scores indicate stronger stress reactions. Cronbach's alpha coefficient in this study was

0.929. Permission to use the SRS was obtained from the Japanese Ministry of Health,

Labour and Welfare.

Statistical Analyses

Means, standard deviations (SD), frequencies (n), and percentages (%) were

calculated for participants' demographic characteristics. For item analyses, the difficulty

of the question item was confirmed by observing the number of missing values.

Kurtosis, skewness, ceiling effect, and floor effect were confirmed by observing their

distribution on the 52 items (26 ISES item scores and 26 DSES item scores) in the

initial version of the PNSS.

Item discrimination was confirmed by ANOVA (low, middle, and high group) as a

good-poor (G-P) analysis. The PNSS factor structure was identified using exploratory

factor analysis (EFA). For reliability, the internal consistency of the factors was

calculated using Cronbach's alpha coefficient. Factor structure validity was confirmed

by confirmatory factor analysis (CFA). The following values are considered good for

each good index: χ^2/df ratio from 2.0 to 3.0, goodness of fit index (GFI) > .90, adjusted

goodness of fit index (AGFI) > .85, comparative fit index (CFI) > .95 and root mean

square error of approximation (RMSEA) < .08.[23] For concurrent and convergent

validity, Pearson's correlation coefficients were calculated to confirm correlation

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between the PNSS and the GSES and SRS factor structures. The significance level was set at $p < .05$.

The evaluation score was developed by ±SD. Concretely, −1.5 SD ≧ is low, -0.5 SD < to −1.5 SD > is low tendency, -0.5 SD ≦ to ＋0.5 SD ≧ is normal, 0.5 SD < to 1.5 SD > is high tendency, and 1.5 SD ≦ is high. Evolution scores were set for each scale and subscale score. The Normal curve standard deviation estimates include 38.2% of the data in the ± 0.5SD range and 86.6% of the data in the ± 1.5SD range. [24]

IBM SPSS version 24.0 for Windows was used for the item analysis, EFA, calculation of reliability, and calculation of convergent and predictive validity. IBM AMOS version 24.0 for windows was used for the CFA.

Sample Size

The main analysis used was factor analysis. If communalities are low, and there are a larger number of factors (more than 3 or 4), a sample size of more than 500 is likely to be required.[25] We required a sample size of over 500, and our sample met that requirement with 514 valid responses.

RESULTS

Demographics

Responses were received from 688 participants (recovery rate = 87.53%). Among the respondents, 581 participants give their informed consent to the investigation. The numbers of missing values for IESS and DSES of the 583 participants who agreed were 1 to 7, and it was judged that there were no items that were difficult to answer. There were 4 participants with large missing data that were presumed to be page oversight, and missing values were excluded. Valid respondents

were 514 with no missing values in the scale item score (effective response rate =

74.70%). Table 1 shows participant demographics.

Table 1. *Participant demographics (N=514)*

Variable	Mean or Number	Standard deviation or percentage
1. Mean age (years)	44.76	11.30
2. Sex		
Male	189	36.8%
Female	324	63.0%
Unanswered	1	0.2%
3. Job positions		
Manager[*]	93	18.1%
Staff	416	80.9%
Unanswered	5	1.0%
4. Qualification		
Registered nurse	406	79.0%
Associate nurse	106	20.6%
Unanswered	2	0.4%
5. Mean nursing experience (years)	18.82	11.56
6. Mean experience of psychiatry department (years)	13.20	9.93
7. Nursing-related educational background		
University/College	29	5.6%
Junior college	26	5.1%
Nursing school	454	88.3%
Unanswered	5	1.0%

Note. Manager: Nursing Director, Head Nurse or Chief Nurse

Item Analysis

Kurtosis and skewness were not detected within ± 2 in the 52-item distribution

of scores.[26] Discriminations for the 52 items were confirmed by a G-P analysis and all items were significant. Item discrimination was confirmed for all items. No ceiling or floor effect was detected within ± 1 SD in the 52-item distribution of scores.

Factor Structure of the PNSS

Items with communality less than 0.2 were excluded from subsequent analysis.[27] The factor structure of the PNSS was identified using EFA. In the process of conducting EFA, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was confirmed. The principal factor method was used in the extraction of factors and promax rotation was conducted. The scree test[28] was used to decide the number of factors. A factor loading of more than 0.5, which is more factor related, was adopted.[29] Items with a factor loading of less than 0.5 were excluded from subsequent analysis. Factor names were determined and discussed by four researchers—two psychology and two psychiatric nursing faculty members.

For the ISES, four items with less than communality 0.2 were excluded from EFA.[27] The KMO measure of sampling adequacy was 0.911, showing that EFA was appropriate.[30] Two factors with 11 items were extracted: 1) "Positive changes in the patient" with 6 items, including items related to those changes as recognized by the nurse. 2) "Prospect of continuing in psychiatric nursing" with 5 items, including items related to experiences of failure and trust and the ability to persevere with nursing.

For the DSES, five items with communality less than 0.2 were excluded from EFA.[27] The KMO measure of sampling adequacy was 0.865, showing that EFA was appropriate.[30] Three factors with 11 items were extracted: 1) "Devaluation of own role as a psychiatric nurse" with three items, including items that made nurses feel underappreciated. 2) "Decrease in nursing ability due to overload" with four items,

including items related to the deterioration of nursing ability in various situations. 3)

"Difficulty in seeing any results in psychiatric nursing" with four items, including items

that make nurses feel their interventions have little effect on patients.

Tables 2 and 3 show the EFA results; Japanese-English translation-reverse

translation was performed by translators, and agreement between languages confirmed

(Supplementary file).

Table 2. *The factor structure for improved self-efficacy among psychiatric nurses*

No	Content of items	Mean±SD	F1	F2	Comm unality
Factor 1: Positive changes in the patient (Cronbach's α= .839)		37.08±8.21			
33	**I feel that I can get words of appreciation from patients by being considerate.**	6.45± 1.87	**.882**	-.201	.610
27	**I feel that compassion makes smile of patients.**	6.84±1.93	**.779**	-.117	.513
35	**I feel that I can get words of thanks from patients.**	6.33±2.00	**.775**	-.171	.375
31	**I feel that some patients are happy.**	6.82±1.78	**.690**	-.005	.472
29	**I feel that the patient is satisfied.**	5.68±1.83	**.566**	.074	.375
41	**I feel that the patient's mind is open.**	4.97±1.60	**.511**	.162	.385
3	I feel that my involvement with the patient is helpful to my life experience.	6.73±1.97	.491	.122	.326
43	I feel that a passive patient's mind is open.	4.83±1.57	.463	.134	.305
45	I feel the building of a relationship of trust with patients.	5.94±1.68	.458	.355	.526
15	I can see that patients are healthy after leaving the hospital.	6.02±2.23	.412	.123	.244
5	I feel that the training is helpful.	7.14±1.72	.309	.221	.225
Factor 2: Prospect of continuing in psychiatric nursing (Cronbach's α= .809)		27.75±6.43			
9	**I can predict the patient's symptoms.**	5.27±1.71	-.197	**.870**	.594
11	**I can foresee nursing.**	5.49±1.64	-.069	**.822**	.614
7	**I feel that I can make a right nursing decision.**	5.25±1.73	-.165	**.730**	.419
1	**I can make use of my own experience of failure.**	6.40±1.75	.008	**.557**	.315
47	**I feel trust from my colleague nurses.**	5.33±1.71	.109	**.507**	.333
21	I can reduce the patient's anxiety by giving advice.	5.80±1.46	.229	.459	.386
39	I feel that the patients understand my explanation.	5.46±1.53	.357	.407	.463
19	I can alleviate the patient's anxiety by listening to the patient's complaints.	6.35±1.63	.258	.339	.347
23	I can improve the patient's rejection of medicine.	4.23±1.85	.119	.390	.221

No	Content of items	Mean±SD			
17	I can see a change in the behavior of a passive patient.	5.27±1.58	.306	.336	.328
25	I feel the patient's symptoms are stable.	5.31±1.69	.304	.311	.300
Scale score total (Cronbach's α= .845)		64.83±12.28			
	Correlation of factors				
			Factor 1	1.000	
			Factor 2	.587	1.000

Note. Bold font indicates the items that comprise the factors.

Table 3. *The factor structure for decreased self-efficacy among psychiatric nurses.*

No	Content of items	Mean±SD	F1	F2	F3	Communality
F1: Devaluation of own role as a psychiatric nurse (Cronbach's α= .655)		13.82±4.77				
44	**I feel that patients do not need me.**	3.97±1.87	**.647**	-.239	.122	.424
52	**I have lost confidence in my attitude toward nursing.**	4.81±2.30	**.616**	.112	-.003	.436
46	**I feel that patients need other staff members than me.**	5.04±2.00	**.536**	.024	-.066	.271
50	I have forgotten to speak to patients with the passage of time.	4.21±2.28	.431	-.070	.065	.193
16	The action was positive for the patient but it was disappointing for me.	4.68±1.89	.426	-.117	.369	.385
6	I feel that even if I make a promise, the patient refuses.	4.47±2.29	.418	.036	.264	.354
8	I feel bad communicating with patients.	4.82±1.99	.391	.098	.147	.270
48	I feel a lack of physical strength.	5.80±2.60	.349	.208	-.047	.193
F2: Decrease in nursing ability due to overload (Cronbach's alpha = .634)		27.03±5.95				
34	**I feel that nursing care is increasing due to the aging of patients.**	8.25±1.72	-.193	**.582**	.026	.312
28	**I feel a risk of violence from patients.**	6.11±2.23	.012	**.574**	.084	.387
30	**I encounter the excitement of patients.**	6.28±2.25	.129	**.549**	-.039	.342
36	**I feel that I have little interaction with patients because of other work.**	6.39±2.36	.271	**.503**	-.171	.329
26	I feel patients have a relapse of mental illness.	6.73±1.82	-.131	.494	.215	.340
32	I feel a decline in my ability to judge for nursing to being busy.	5.98±2.16	.412	.465	.201	.401
10	I feel that I'm repeating the same explanation to the patient.	6.38±1.88	.114	.314	.199	.251
F3: Difficulty in seeing any results in psychiatric nursing (Cronbach's alpha = .737)		21.54±5.58				
14	**I do not feel the effectiveness of the care given to the patients.**	4.50±1.81	.124	-.187	**.641**	.399
12	**I feel that the patient's symptoms have not improved.**	5.72±2.00	.068	.045	**.612**	.442
20	**I feel ambiguity about the treatment effect.**	5.72±1.88	.054	.083	**.589**	.431
18	**I feel uncertain about the patient's symptoms.**	5.61±1.76	.036	.113	**.504**	.338
22	I feel that there are patients who are uncooperative for treatment.	6.51±2.04	-.142	.431	.460	.508

4	I feel that there are patients who do not participate in the treatment.	7.00±2.07	-.132	.323	.398	.328
Scale score total (Cronbach's alpha = .749)		68.37±13.10				
Correlation of factors						
		Factor 1	1.000			
		Factor 2	.334	1.000		
		Factor 3	.407	.464	1.000	

Note. Bold font indicates the items that comprise the factors.

Reliability of the PNSS

To determine the ISES and DSES reliability, we calculated Cronbach's alpha coefficient for each scale and subscale (Tables 2 and 3). Cronbach's alpha coefficient was .839 for "Positive changes in the patient," .809 for "Prospect of continuing in psychiatric nursing," .845 for the overall ISES, .655 for "Devaluation of own role as a psychiatric nurse," .634 for "Decrease in nursing ability due to overload," .737 for "Difficulty in seeing any results in psychiatric nursing," and .749 for the overall DSES.

Validity of the PNSS

For factorial validity, the compatibility of the extracted factors was analyzed by CFA. For the ISES, the results followed the goodness of fit model: χ^2/df (292.87/43) ratio = 6.81 ($p < .01$), GFI = .897, AGFI = .842, CFI = .888, RMSEA = .106 and Akaike Information Criterion (AIC) = 338.87. The goodness of fit was not high; therefore, we assumed there were correlations among error variables in a factor, based on the modification index, and developed a revised model to fit the data. The error variable is an item-specific variable obtained by removing the influence of the factor from the observed variable. Paths were created between error variables as moderate positive correlations between e33 and e35, weak positive correlations between e29 and e31, e29 and e41 and e1 and e7, weak negative correlations between e31 and e35 and e27 and e41, yielding the following results: χ^2/df (110.625/37) ratio = 2.990 ($p< .001$), GFI

= .962, AGFI = .932, CFI = .967, RMSEA = .062, and AIC = 168.625 (Figure 1).

For the DSES, the results followed the goodness of fit model: χ^2/df

(181.369/41) ratio = 4.424 ($p < .001$), GFI = .942, AGFI = .906, CFI = .876, RMSEA

= .082, AIC = 231.369. The goodness of fit was not high, therefore, we assumed there

were correlations among error variables in a factor, based on the modification index,

and developed a revised model to fit the data. Paths were created between error

variables as weak positive correlations between e44 and 46, e34 and e36, e28 and e30

and e14 and e12, yielding the following results: χ^2/df (101.982/37) ratio = 2.756 (p

< .001), GFI = .966, AGFI = .940, CFI = .943, RMSEA = .059, and AIC = 159.982

(Figure 2).

[Figure 1 near here]

[Figure 2 near here]

To determine the concurrent and convergent validity of the ISES and DSES,

the correlation coefficient with external variables was calculated for each scale and

subscale score. In consideration of the concurrent validity, the GSES was used as an

external variable. The correlation coefficient ranged from .149 to .446 ($p < .001$)

between the ISES and each ISES subscale score and the GSES score, indicating a weak-

medium correlation. The correlation coefficient ranged from -.154 to -.462 between the

DSES and each DSES subscale score and the GSES score, indicating a weak-medium

correlation. In consideration of the convergent validity, the SRS was used as an external

variable. The correlation coefficient ranged from -.128 to -.161 ($p < .001$) between the

ISES and each ISES subscale score and the SRS score, indicating a weak correlation.

The correlation coefficient ranged from .214 to .398 between the DSES and each DSES

subscale score and the SRS score, indicating a weak correlation. Table 4 shows the

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results of concurrent and convergent validities.

Table 4. *The PNSS and the GSES, the SRS and the intention to continue working*

correlations

	The GSES	The SRS
Positive changes in the patient	.149*	-.128*
Prospect of continuing in psychiatric nursing	.446*	-.143*
Improved Self-Efficacy Scale total	.333*	-.161*
Devaluation of own role as a psychiatric nurse	-.462*	.398*
Decrease in nursing ability due to overload	-.154*	.214*
Difficulty in seeing any results in psychiatric nursing	-.174*	.272*
Decreased Self-Efficacy Scale total	-.201*	.302*

Note. *p < .001; PNSS: Psychiatric Nurse Self-Efficacy Scales; GSES: General Self-Efficacy Scale; SRS: Stress Reaction Scale.

DISCUSSION

This study examined the development and usefulness of a scale to evaluate psychiatric

nurses' self-efficacy comprehensively. The Improved Self-Efficacy Scale has two

factors ("Positive changes in the patient" and "Prospect of continuing in psychiatric

nursing") and the Decreased Self-Efficacy Scale has three ("Decrease in nursing ability

due to overload," "Devaluation of own role as a psychiatric nurse," and "Difficulty in

seeing any results in psychiatric nursing"). Statistical analyses showed the scales to be

valid measures. The following is a discussion of the results.

Participants' Characteristics

        The distribution of age, years of psychiatric experience, and job title seemed to

be roughly the same, but the proportion of males in this study was higher than that in a

previous study. [31] The ratio of the education level of the study participants also

seemed to be in rough agreement with a previous study. [16]

ISES Analysis

The factor "Positive changes in the patient" was similar to that of "Positive

reaction of patients," one of the factors of self-efficacy revealed in Yada et al.'s[16]

study. Patience is required to treat psychiatric symptoms. Drug therapy and

psychotherapy are less effective for treating the negative symptoms of schizophrenia,

and long-term interventions by skilled specialists are required for this purpose.[32] In

such situations, psychiatric nurses may experience improved self-efficacy, when they

see positive changes in the patient.

The factor "Prospect of continuing in psychiatric nursing" was found to have a

different meaning than that revealed in a previous study.[16] According to critics of

psychiatry, psychiatric diagnoses lack objectivity. [33] Psychiatric nurses need to

predict the condition from the patient's behavior. This requires working together with

their own experience and teams, which may improve self-efficacy when psychiatric

nurses are able to see patient care.

DSES Analysis

The factor "Devaluation of own role as a psychiatric nurse" was similar to

"Nurse's loss of role."[16] In psychiatry, the sense of distance from the patient varies

from person to person, and it is difficult to obtain an appropriate distance in patient care.

[20] If the psychiatric nurse does not keep the proper distance from the patient, the

patient may rely on other reliable nurses, and the psychiatric nurse may feel role loss

and reduce self-efficacy. [20]

The factor "Decrease in nursing ability due to overload" was found to have a

different meaning to that found in a previous study.[16] The responsibilities of

psychiatric nurses include not just patient care but also lots of administrative work. One

survey of psychiatric nurses found that 2.18 minutes were spent on symptom

management, while two hours were spent on the related paperwork, and nurses who

spent more time on direct patient care were more satisfied.[34] When psychiatric nurses

are unable to spend enough time on patient care, they may feel that they are not

providing sufficient care, which may lead to reduced feelings of self-efficacy. In

addition, one-third of patients admitted to Japan's psychiatric wards in 2017 were 75

and over.[35] Older people often experience two or more chronic illnesses.[36] Aging

increases the risk of dementia. Most dementias require care in daily life, and dealing

with BPSD (Behavioral and Psychological Symptoms of Dementia) is also a problem as

a symptom of dementia in psychiatry. [37] While, about half of Japanese psychiatric

home-visiting nurses experience violence from their patients, especially verbal violence,

and some nurses are at risk of post-traumatic stress disorder.[38] According to previous

research, when commissioned welfare volunteers feel threatened by people with mental

health problems, it can lead to a deterioration of social distance between commissioned

welfare volunteers and people with mental health problems.[39] Similarly, when

psychiatric nurses experience patient violence, they may feel threatened and unable to

care for the patient any longer, which can lead to a feeling of decreased self-efficacy

due to the loss of their role. Thus, psychiatric nurses are burdened with aging and

violence in their patient, it may result in reduced self-efficacy.

The factor "Difficulty in seeing any results in psychiatric nursing" was similar to

"Uncertainty about psychiatric nursing."[16] As discussed, the average length of stay

for Japanese psychiatric patients is much longer than in other countries,[14] and

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deinstitutionalization is evolving slowly. Psychiatric nurses, even with hard care, may

not see the patient's condition improve and be discharged. Psychiatric nurses may feel

they do not achieve any results from their care and thus experience feelings of lower

self-efficacy.

Reliability and Validity of Scales

        To prove the reliability of subscales and scales, Cronbach's alpha should

exceed .60, and scores greater than .95 indicate redundancy.[40] A previous study

indicated that "An alpha coefficient of 0.70 has often been regarded as an acceptable

threshold for reliability; however, 0.80 and 0.95 is preferred for the psychometric

quality of scales."[41] The internal consistencies of some subscale may be not

unacceptable, but not enough. As mentioned above, some of the factor structures related

to the self-efficacy of psychiatric nurses in our previous study[16] were similar to those

in this study. However, unlike the current findings, most of the previous studies

reported high internal consistencies. Therefore, this decrease in Cronbach's α coefficient

may be due to sample differences, and thus, future research is needed.

        The factorial validity and goodness of fit indices were confirmed for ISES and

DSES. Each value of the revised model for the ISES and the DSES exceeded

indices,[23] indicating acceptable goodness of fit. For convergent and predictive

validity, the ISES and the DSES showed a weak-medium significant correlation

between the GSES and the SRS. The ISES and the DSES were judged to be measures

that can evaluate self-efficacy and associated stress.

The Future of Psychiatric Nurses' Mental Health

        The ISES factors "Positive changes in the patient" and "Prospect of continuing

in psychiatric nursing," and the DSES factors "Decrease in nursing ability due to

overload," "Devaluation of own role as a psychiatric nurse," and "Difficulty in seeing

any results in psychiatric nursing" were developed in the current study. Self-efficacy is

recovered through resilience,[42] so it was necessary to confirm how resilience can

control "Positive changes in the patient," "Prospect of continuing in psychiatric

nursing," "Decrease in nursing ability due to overload," "Devaluation of own role as a

psychiatric nurse," and "Difficulty in seeing any results in psychiatric nursing" for

psychiatric nurses' future mental healthcare.

Future Avenues for This Research

The scales of this study have aspects of improving and decreasing self-efficacy

of psychiatric nurses, and each scale has multiple subscales. Therefore, it is possible to

grasp the self-efficacy from multiple aspects. In the future, multifaceted intervention in

the self-efficacy of psychiatric nurses will be possible. However, this scale requires

further examination for reliability and validity among different samples to determine its

cross validation and predictive validity. Moreover, future studies are also needed to

validate the test-retest reliability.

Study Limitations

Some limitations of the present study are that there were more male participants

than in previous studies, which may be due to selection bias. A method such as non-

probability sampling is required as a sample extraction method. In addition, the standard

scores were calculated from the data of this study, so the results are not absolute

indices; follow-up studies are required.

CONCLUSIONS

In this study, the ISES factors "Positive changes in the patient" and "Prospect of

continuing in psychiatric nursing" and the DSES factors "Decrease in nursing ability

due to overload," "Devaluation of own role as a psychiatric nurse," and "Difficulty in seeing any results in psychiatric nursing" were developed for the PNSS. Reliability and validity analyses indicated that the ISES and the DSES are useful. Using these scales, it is possible to formulate programs for improving psychiatric nurses' feelings of self-efficacy.

Interventions to increase resilience are useful for improving their positive feelings of self-efficacy and preventing feelings of decreased self-efficacy. It is necessary to confirm how resilience can control "Positive changes in the patient," "Prospect of continuing in psychiatric nursing," "Decrease in nursing ability due to overload," "Devaluation of own role as a psychiatric nurse," and "Difficulty in seeing any results in psychiatric nursing" for mental healthcare planning. When measuring the self-efficacy of psychiatric nurses in intervention studies, scales should be used to indicate directions for effective mental healthcare. Interventions to increase the resilience of psychiatric nurses are useful for improving self-efficacy and preventing feelings of decreased self-efficacy. Improved psychiatric nurse self-efficacy will have positive consequences for patient care.

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Conflict of Interest: None.

Author Contributions: HY, RO, KA, HA were involved in study design. HY obtained funding. HY, TF, MF, and TK took part in the investigation. HY, RO, KA, HA, FY, TF, MF, and TK were involved in data analysis and interpretation. All authors critically revised the report, commented on drafts of the manuscript, and approved the final manuscript.

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PSYCHIATRIC NURSE SELF-EFFICACY SCALES   29

Figure 1. Fit indices of the proposed models for the Improved Self-Efficacy Scale (ISES). The ISES was found to fit a two-factor structure with 11 items. $\chi 2/df$ (110.625/37, $p<$ .001): 2.990, Goodness of fit index: .962; Adjusted goodness of fit index: .932, Comparative fit index: .967; Root mean square error of approximation: .062; Akaike Information Criterion: 168.625.

PSYCHIATRIC NURSE SELF-EFFICACY SCALES   30

Figure 2. Fit indices of the proposed models for the Decreased Self-Efficacy Scale (DSES). The DSES was found to fit a three-factor structure with 12 items. $\chi2$/df(101.982/37, *p*< .001): 2.756, Goodness of fit index: .966; Adjusted goodness of fit index: .940, Comparative fit index: .943; Root mean square error of approximation: .059, Akaike Information Criterion: 159.982.

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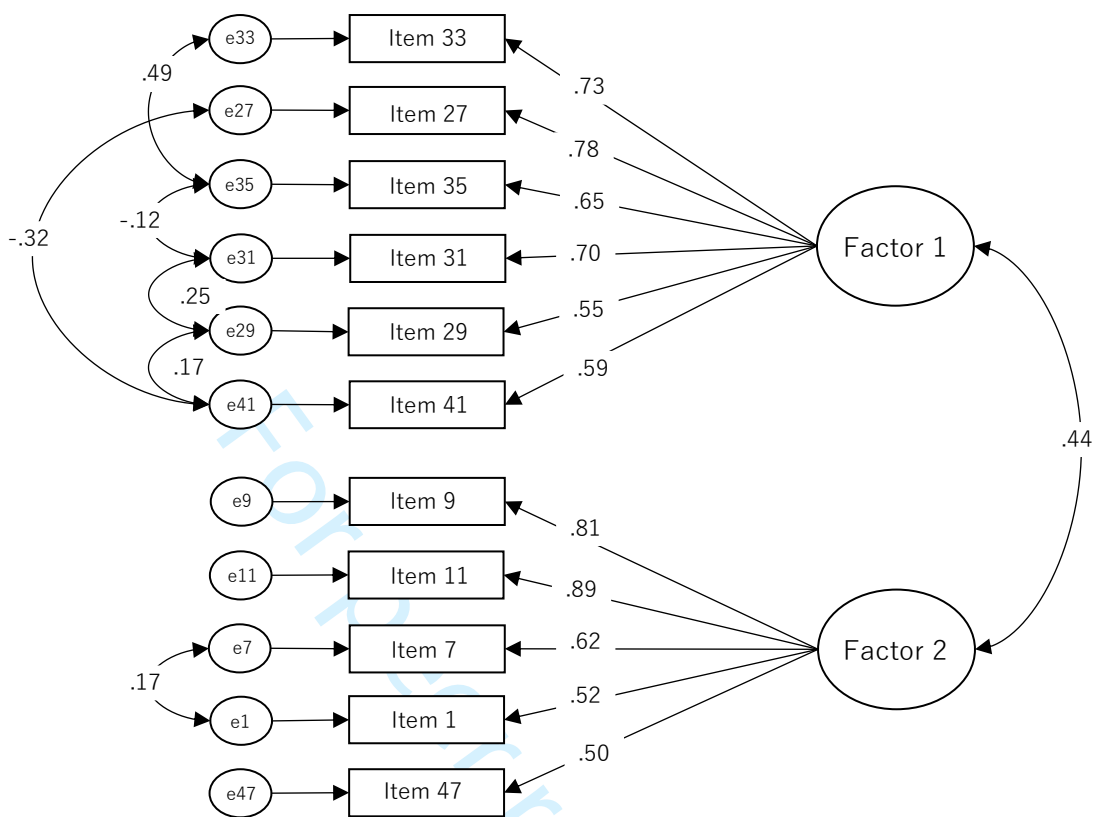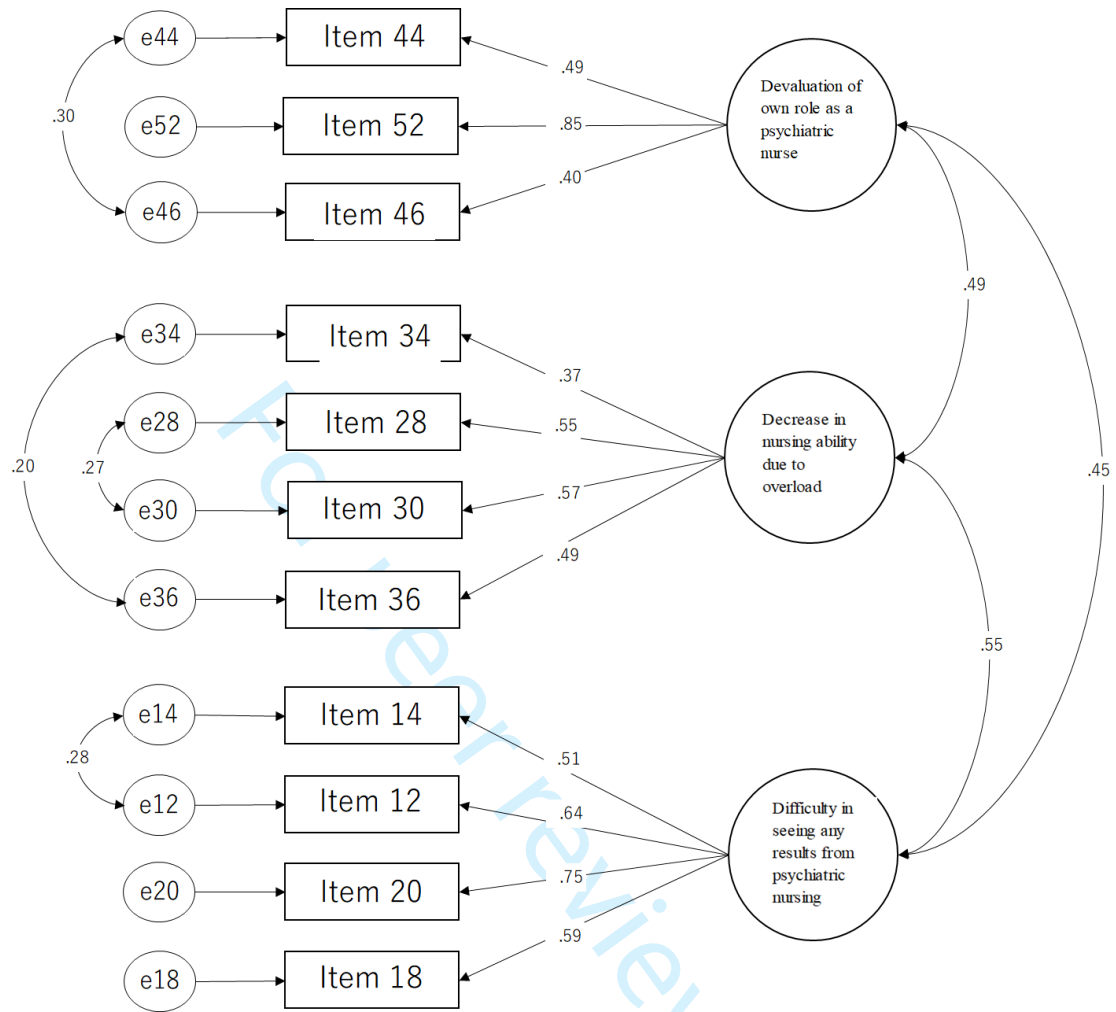
Appendix I: Gray highlights indicate Japanese translation.
Improved Self-Efficacy Scale (ISES: 自己効力感向上尺度)

These questions ask about <u>your present psychiatry department work</u>. Please circle (○) the number that best matches your response.

現在のあなたの精神科でのお仕事についてうかがいます．あなたが最も当てはまると思う番号に○をつけてください．

No	Question Item	Not at all← →Yes
1	I feel that I can get words of appreciation from patients by being considerate. 私は、思いやることで患者からの感謝の言葉が得られると感じる。	0 1 2 3 4 5 6 7 8 9 10
2	I feel that compassion makes smile of patients. 私は、思いやることで患者が笑顔になると感じる。	0 1 2 3 4 5 6 7 8 9 10
3	I feel that I can get words of thanks from patients. 私は、患者からのお礼の言葉が得られると感じる。	0 1 2 3 4 5 6 7 8 9 10
4	I feel that some patients are happy. 私は、患者の喜ぶ姿があると感じる。	0 1 2 3 4 5 6 7 8 9 10
5	I feel that the patient is satisfied. 私は、患者の満足している姿があると感じる。	0 1 2 3 4 5 6 7 8 9 10
6	I feel that the patient's mind is open. 私は、患者の心が開示されていると感じる。	0 1 2 3 4 5 6 7 8 9 10
7	I can predict the patient's symptoms. 私は、患者の症状に見通しをたてることができる。	0 1 2 3 4 5 6 7 8 9 10
8	I can foresee nursing. 私は、看護に見通しを立てることができる。	0 1 2 3 4 5 6 7 8 9 10
9	I feel that I can make a right nursing decision. 私は、正しい看護判断ができると感じる。	0 1 2 3 4 5 6 7 8 9 10
10	I can make use of my own experience of failure. 私は、自身の失敗経験をいかすことができる。	0 1 2 3 4 5 6 7 8 9 10
11	I feel trust from my colleague nurses. 私は、同じ看護師から寄せられる信頼を感じる。	0 1 2 3 4 5 6 7 8 9 10

Items 1-6: Positive changes in the patient (患者のポジティブな変化), Items 7-11: Prospect of Continuing in Psychiatric Nursing (精神科看護継続の見通し)

Appendix II: Gray highlights indicate Japanese translation.
Decreased Self-Efficacy Scale (DSES: 自己効力感低下尺度)
These questions ask about <u>your present psychiatry department work</u>. Please circle (○) the number that best matches your response.
<u>現在のあなたの精神科でのお仕事</u>についてうかがいます. あなたが最も当てはまると思う番号に○をつけてください.

No	Question Item	Not at all← 　　　　　　　 →Yes
1	I feel that patients do not need me. 私は患者から必要とされていないと感じる。	0 1 2 3 4 5 6 7 8 9 10
2	I have lost confidence in my attitude toward nursing. 私は、看護観に対する自信の喪失がある。	0 1 2 3 4 5 6 7 8 9 10
3	I feel that patients need other staff members than me. 私は、患者から自分よりも他のスタッフが必要とされていると感じる。	0 1 2 3 4 5 6 7 8 9 10
4	I feel that nursing care is increasing due to the aging of patients. 私は患者の高齢化により介護が増加していると感じる。	0 1 2 3 4 5 6 7 8 9 10
5	I feel a risk of violence from patients. 私は、患者からの暴力のリスクを感じる。	0 1 2 3 4 5 6 7 8 9 10
6	I encounter the excitement of patients. 私は、患者の興奮に遭遇する。	0 1 2 3 4 5 6 7 8 9 10
7	I feel that I have little interaction with patients because of other work. 私は、他の業務のせいで患者との関わりが少ないと感じる。	0 1 2 3 4 5 6 7 8 9 10
8	I do not feel the effectiveness of the care given to the patients. 私は、患者に行ったケアの有効性を感じない。	0 1 2 3 4 5 6 7 8 9 10
9	I feel that the patient's symptoms have not improved. 私は、患者の症状の改善のなさを感じる。	0 1 2 3 4 5 6 7 8 9 10
10	I feel ambiguity about the treatment effect. 私は、治療効果にあいまいさを感じる。	0 1 2 3 4 5 6 7 8 9 10
11	I feel uncertain about the patient's symptoms. 私は、患者の症状にあいまいさを感じる。	0 1 2 3 4 5 6 7 8 9 10

Items 1-3: Devaluation of own role as a psychiatric nurse (精神科看護師としての自身の役割のなさ), Items 4-7: Decrease in nursing ability due to overload (過重な負担による看護力の低下), Items 8 - 11: Difficulty in seeing any results from psychiatric nursing (精神科看護の結果を見ることの困難さ

Appendix Ⅲ. *The ISES and DSES score evaluation*

Class	Low	Slightly Low	Mid-range	Slightly High	High
SD range	less than -1.5	less than -0.5 to -1.5 or more	within ±0.5	over 0.5 to less than 1.5	over 1.5
Positive changes in the patient	0-24	25-32	33-41	42-48	49-60
Prospect of continuing in psychiatric nursing	0-18	19-24	25-30	31-36	37-50
Improved Self-Efficacy Scale total	0-46	47-58	59-70	71-82	83-110
Devaluation of own role as a psychiatric nurse	0-6	7-11	12-16	17-20	21-30
Decrease in nursing ability due to overload	0-18	19-24	25-30	31-35	36-40
Difficulty in seeing any results in psychiatric nursing	0-13	14-18	19-24	25-29	30-40
Decreased Self-Efficacy Scale total	0-48	49-62	63-77	78-91	92-120

Note. Each number means the range of scores. SD: Standard Deviation; ISES: Improved Self-Efficacy Scale; DSES: Decreased Self-Efficacy Scale.

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	5
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods			
Study design	4	Present key elements of study design early in the paper	1
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7
Bias	9	Describe any efforts to address potential sources of bias	9
Study size	10	Explain how the study size was arrived at	9
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	-
		(*b*) Describe any methods used to examine subgroups and interactions	-
		(*c*) Explain how missing data were addressed	6
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	9
		(*e*) Describe any sensitivity analyses	-
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	9
		(b) Give reasons for non-participation at each stage	-
		(c) Consider use of a flow diagram	-
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	9
		(b) Indicate number of participants with missing data for each variable of interest	9
Outcome data	15*	Report numbers of outcome events or summary measures	10
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	-

		(*b*) Report category boundaries when continuous variables were categorized	-
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	-
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	-

Discussion			
Key results	18	Summarise key results with reference to study objectives	17
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	21
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	17
Generalisability	21	Discuss the generalisability (external validity) of the study results	17

Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	23

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.