



## Factors Affecting Respiratory Unit Nurses' Self-Rated Ability to Care for Patients with Chronic Obstructive Pulmonary Disease

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**Objective:** This study aimed to identify the influence of nursing practice environments and respiratory unit nurses' demographic characteristics on nurses' self-rated ability to care for patients with chronic respiratory diseases, particularly COPD.

**Design:** Cross-sectional study.

**Methods:** Self-administered questionnaires were sent to 464 nurses in advanced treatment hospitals and other hospitals. A total of 257 nurses (55.4% response rate) returned completed answers. Questions were on areas such as demographic information and the Practice Environment Scale of the Nursing Work Index, which assesses nursing practice environments and self-rated ability across seven areas: "understanding disease", "understanding patients", "respiratory rehabilitation", "helping patients and families", "protecting the rights of patients and families", "cooperating with other health workers", and "being a role model".

**Results:** A good relationship between nurses and physicians was positively associated with all aspects of self-rated nursing ability except "understanding disease" and "helping patients and families". A specialist qualification in chronic care nursing, chronic respiratory nursing, palliative care, or intensive care, or being a certified therapist of respiration, was positively associated with all aspects of self-rated nursing ability except "protecting the rights of patients and families" and "cooperating with other health workers". The nursing supervisor's capacity was positively related to "cooperating with other health workers" and "being a role model". Years of experience in working on a respiratory disease unit was positively associated with "being a role model".

**Conclusions:** A specialist qualification and a better relationship with attending physicians enabled nurses to provide high-quality nursing for patients with chronic respiratory diseases.

**Key words:** nursing practice environment, patients with chronic respiratory disease, chronic respiratory disease nursing, respiratory rehabilitation

### Introduction

Chronic obstructive pulmonary disease (COPD) is a common, preventable, and treatable disease characterized by persistent respiratory symptoms and airflow limitation due to airway and/or alveolar abnormalities, which are usually caused by considerable exposure to noxious particles or gases<sup>1) 2)</sup>. The primary goal of treatment for COPD patients is

to prevent progression of the pathological condition and alleviate symptoms by a combination of medication, respiratory rehabilitation, and nutritional therapy<sup>3)-5)</sup>, as well as education. Education of COPD patients covers topics such as exercise, nutrition/diet, combinations of medication, oxygen therapy, psychological support, social activities, and social resources; all of these factors support patients in caring for themselves (i.e., comprehensive

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pulmonary rehabilitation)<sup>6)-9)</sup>.

Conventional education/instruction on COPD has mainly consisted of information on the disease and its treatment. Additional to this, it is important to educate patients regarding long-term self-management techniques and behavioral change<sup>10)-12)</sup>. Care for patients with COPD should also be seen as provision of continuous, rather than temporary, interventions<sup>13)</sup>. These interventions include medical care for patients with spiritual, mental, and nutritional disorders associated with a diagnosis of respiratory disease, and support for independent daily living and social rehabilitation. A multidisciplinary professional team must therefore provide comprehensive care<sup>5)</sup>. This team should share information and policy regarding patient education. Nurses in care teams, who provide the bulk of the care and spend the most time with patients and their families, play an important role in educating the patients<sup>14)</sup>.

The information provided to COPD patients and the educational approaches used vary across healthcare institutions<sup>10) 15) 16)</sup>. In 2004, to address this issue, the Japanese Nursing Association established a system of qualifications for certified nurse specialists. Those who earn this certification are able to provide high-level nursing care for preventing lifestyle-dependent diseases, management for those living with chronic physical and/or mental disorders, health promotion, support for recovery, and other nursing interventions<sup>17)</sup>. These nurses are expected to undergo training to provide high-level care for patients with chronic respiratory diseases during the stable, exacerbation, and terminal stages, and to help improve the quality of life of both patients and their families. They may also act as consultants to other nursing professionals. The quality of care is generally assured by the medical institutions employing the nurses, but there are few detailed studies regarding nursing interventions for chronic respiratory diseases.

Some institutions attempt to provide high-quality nursing care without employing certified nurse specialists or certified nurses. High-quality nursing care also requires a favorable nursing practice environment<sup>18)</sup>. The present study therefore aimed to examine the influence of nursing practice environment on efficacy of nursing care for patients with chronic respiratory diseases, particularly

COPD.

## Materials and Methods

### 1. Subjects and study procedure

First, the authors sought the participation of hospital directors and directors of nursing at 27 advanced treatment hospitals in Japan. These hospitals were located in the regions across the country. Of these, the directors at 17 hospitals approved of having their full personnel take part in this study.

Second, the authors asked the hospital directors and directors of nursing in 68 hospitals not engaged in advanced treatment to participate. Among these, the directors at 25 hospitals approved of having their full personnel take part in the present study.

The authors also asked these same types of directors in three other hospitals to participate. Although the nurses in these hospitals had no specialist qualifications in chronic care nursing or chronic respiratory nursing, they appeared to provide high-quality nursing. All in this group agreed to take part.

The numbers of beds in the participating hospitals, apart from the advanced treatment hospitals, ranged from 199 to 600, and all hospitals had a respiratory unit.

Self-administered questionnaires were sent to 464 nurses involved in caring for patients with respiratory diseases in the above-mentioned hospitals. Complete answers were obtained from 257 (55.4% response rate), and used for the analysis. The study was conducted from October 2015 to February 2016. Approval was provided by the Research Ethics Committee of the Juntendo University Faculty of Medicine (No. 2014090).

### 2. Questionnaires

The questionnaires included the Japanese version of the Practice Environment Scale-Nursing Work Index (PES-NWI)<sup>19)-22)</sup> and questions about demographic characteristics such as age group, years of nursing experience, years of experience in a respiratory disease unit, position, educational background, level of specialist certification, and number of beds in the hospital.

The PES-NWI consists of five subscales: nurse participation in hospital affairs, nursing foundations for quality of care, nurse manager ability, leadership

and support, staffing and resource adequacy, collegial nurse-physician relations<sup>20</sup>). There are 31 items under those sub-scales, and each respondent answered items with regard to the environment in their workplace. Permission was obtained for using PES-NWI questionnaires from the scale developers of both the original and Japanese versions.

Responses in the PES-NWI were chosen from a four-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). The mean scores of the five subscales were calculated and analyzed. Higher scores indicated greater agreement that the subscale items were present in the current job.

Respondents also assessed their ability to provide nursing care in seven aspects:

1. Ability to understand pathological conditions, such as chronic respiratory diseases, and provide respiratory management and care services (“understanding disease”)
2. Ability to understand psychological, social, and spiritual problems that may occur in patients with diseases, and provide support for them to resolve these problems (“understanding patients”)
3. Ability to conduct respiratory rehabilitation appropriate for specific pathological conditions/symptoms (“respiratory rehabilitation”)
4. Ability to provide efficient instructions on continuous recuperation to help patients and their families to use appropriate self-management techniques (“helping patients and families”)
5. Ability to protect the rights of patients with chronic respiratory diseases and their families and to provide nursing that respects self-determination (“protecting the rights of patients and families”)
6. Ability to cooperate with other healthcare workers to promote advanced high-quality medical care (“cooperating with other health workers”)
7. Ability to be a role model by providing nursing care for patients with chronic respiratory diseases and instructions and consultations to other nursing professionals (“being a role model”)

Nurses assessed their ability on another four-point Likert-type scale. Those responses were translated into a two-point scale in which “always

done” and “sometimes done” were consolidated into “Yes”, and “not always done” and “not done at all” into “No”.

### 3. Statistical analysis

Differences in demographic characteristics, and PES-NWI<sup>16)-19)</sup> scores on nursing environment and each of the seven aspects of ability to provide nursing care were examined with a t-test or Fisher’s exact test.

Stepwise logistic regression analysis (likelihood method) was performed using “Yes” or “No” for each aspect of ability to provide nursing care as a dependent variable. The independent variables were characteristics of nurses and the practice environment (PES-NWI). IBM SPSS Statistics for Windows, Version 24.0 (IBM Corporation, Japan) was used for the analysis, and  $p < 0.05$  in a two-tailed test was considered statistically significant.

## Results

Table-1 shows that characteristics and nursing practice environment significantly affected the 257 participants’ self-rated abilities. There were significant differences in the ability of “understanding disease”, “understanding patients”, “respiratory rehabilitation”, “helping patients and families”, and “being a role model” between certified and non-certified nurses. Nursing practice environment was also linked to significant differences in all self-rated abilities except “understanding disease”.

Table-2 shows the results of the stepwise logistic regression analysis. A good relationship between nurses and physicians had a positive association with all aspects of self-rated nursing ability except “understanding disease” and “helping patients and families”. A specialist qualification had a positive relationship with all aspects of self-rated nursing ability except “protecting the rights of patients and families” and “cooperating with other health workers”. The capacity of the nursing supervisor was positively related to “cooperating with other health workers” and “being a role model”. Years of experience in a respiratory disease unit was positively related to “being a role model”.

## Discussion

To the authors’ knowledge, this is the first study to demonstrate that specialist qualifications and

**Table-1** Influence of Practice Environment Scale of the Nursing Work Index (PES-NWI) scores and characteristics of 257 nurses on their self-rated ability to deliver nursing care

		Understanding disease		Understanding patients		Respiratory rehabilitation	
		Yes (n=212)	No (n=45)	Yes (n=166)	No (n=91)	Yes (n=114)	No (n=143)
PES-NWI Scores <sup>a)</sup>							
Nurse Participation in Hospital Affairs		2.63 (0.52)	2.64 (0.45)	2.68 (0.54)*	2.55 (0.44)	2.72 (0.51)*	2.56 (0.50)
Nursing Foundations for Quality of Care		2.77 (0.46)	2.70 (0.43)	2.81 (0.49)*	2.68 (0.38)	2.83 (0.47)*	2.70 (0.43)
Nurse Manager Ability, Leadership and Support		2.87 (0.63)	2.85 (0.64)	2.89 (0.65)	2.82 (0.59)	2.95 (0.59)*	2.80 (0.66)
Staffing and Resource Adequacy		2.23 (0.59)	2.16 (0.54)	2.27 (0.61)*	2.11 (0.51)	2.28 (0.62)	2.17 (0.55)
Collegial Nurse-Physician Relations		2.89 (0.54)	2.80 (0.49)	2.96 (0.55)***	2.72 (0.47)	3.00 (0.52)***	2.77 (0.52)
Characteristics <sup>b)</sup>							
Age group (years)	20-29	89 (81.7)	20 (18.3)	67 (61.5)	42 (38.5)	43 (39.4)	66 (60.6)
	30-39	73 (86.9)	11 (13.1)	58 (69.0)	26 (31.0)	37 (44.0)	47 (56.0)
	≥ 40	50 (78.1)	14 (21.9)	41 (64.1)	23 (35.9)	34 (53.1)	30 (46.9)
Years of nursing experience (years)	0-5	83 (80.6)	20 (19.4)	58 (56.3)	45 (43.7)	42 (40.8)	61 (59.2)
	6-10	38 (88.4)	5 (11.6)	34 (79.1)	9 (20.9)	20 (46.5)	23 (53.5)
	≥ 11	91 (82.0)	20 (18.0)	74 (66.7)	37 (33.3)	52 (46.8)	59 (53.2)
Years of experience working on a respiratory disease unit	< 5	125 (80.6)	30 (19.4)	91 (58.7)	64 (41.3)	62 (40.0)	93 (60.0)
	≥ 5	87 (85.3)	15 (14.7)	75 (73.5)	27 (26.5)	52 (51.0)	50 (49.0)
Duty position	Manager	43 (87.8)	6 (12.2)	36 (73.5)	13 (26.5)	28 (57.1)	21 (42.9)
	Staff/others	169 (81.3)	39 (18.8)	130 (62.5)	78 (37.5)	86 (41.3)	122 (58.7)
Educational background	University degree	80 (86.0)	13 (14.0)	65 (69.9)	28 (30.1)	41 (44.1)	52 (55.9)
	Others	132 (80.5)	32 (19.5)	101 (61.6)	63 (38.4)	73 (44.5)	91 (55.5)
Specialist certification <sup>c)</sup>	Certified	49 (92.5)	4 (7.5)	41 (77.4)	12 (22.6)	38 (71.7)	15 (28.3)
	Not certified	163 (79.9)	41 (20.1)	125 (61.3)	79 (38.7)	76 (37.3)	128 (62.7)
Number of hospital beds	≥ 500 beds	184 (83.6)	36 (16.4)	145 (65.9)	75 (34.1)	96 (43.6)	124 (56.4)
	Others	28 (75.7)	9 (24.3)	21 (56.8)	16 (43.2)	18 (48.6)	19 (51.4)

\* , \*\* , \*\*\* =  $p < 0.05, 0.01, 0.001$  (Welch's *t* test for mean differences)

† , †† , ††† =  $p < 0.05, 0.01, 0.001$  (Fisher's exact test for categorical data)

<sup>a)</sup> Mean (standard deviation), <sup>b)</sup> Number (%), <sup>c)</sup> Specialist qualification in any of chronic care nursing, chronic respiratory nursing, palliative care, intensive care, or providing respiratory therapy

better relationships with attending physicians were positively associated with nurses' self-rated ability to provide high-quality nursing for patients with chronic respiratory diseases.

In this study, more participants answered "No" than "Yes" regarding provision of education on self-management, particularly respiratory rehabilitation. This result suggests that providing education and respiratory rehabilitation may be challenging. This may be because many nurses believe that

physiotherapists are responsible for rehabilitation, or because they are not confident about techniques for providing this care. Patients with chronic respiratory diseases have a high need for respiratory rehabilitation. Considerable evidence is available on the efficacy of this care<sup>23)</sup>, which should be initiated during hospitalization.

Nurses' characteristics were not linked to any differences in ability to protect the rights to self-determination of patients with chronic respiratory

Helping patients and families		Protecting the rights of patients and families		Cooperate with other health workers		Being a role model	
Yes (n=187)	No (n=70)	Yes (n=189)	No (n=68)	Yes (n=197)	No (n=60)	Yes (n=147)	No (n=110)
2.65 (0.54)	2.59 (0.43)	2.68 (0.52)*	2.51 (0.47)	2.66 (0.53)	2.55 (0.43)	2.73 (0.50)***	2.50 (0.49)
2.78 (0.49)	2.71 (0.35)	2.82 (0.47)***	2.60 (0.36)	2.80 (0.48)**	2.62 (0.33)	2.85 (0.46)***	2.64 (0.42)
2.88 (0.65)	2.82 (0.58)	2.93 (0.62)**	2.68 (0.64)	2.90 (0.63)	2.75 (0.62)	2.93 (0.64)*	2.77 (0.62)
2.27 (0.61)*	2.08 (0.50)	2.28 (0.61)***	2.03 (0.46)	2.28 (0.59)**	2.01 (0.52)	2.35 (0.60)***	2.05 (0.51)
2.96 (0.53)***	2.65 (0.48)	2.95 (0.53)***	2.64 (0.47)	2.91 (0.54)*	2.74 (0.49)	3.00 (0.48)***	2.69 (0.54)
75 (68.8)	34 (31.2)	81 (74.3)	28 (25.7)	83 (76.1)	26 (23.9)	60 (55.0)	49 (45.0)
65 (77.4)	19 (22.6)	59 (70.2)	25 (29.8)	66 (78.6)	18 (21.4)	52 (61.9)	32 (38.1)
47 (73.4)	17 (26.6)	49 (76.6)	15 (23.4)	48 (75.0)	16 (25.0)	35 (54.7)	29 (45.3)
67 (65.0)	36 (35.0)	73 (70.9)	30 (29.1)	76 (73.8)	27 (26.2)	52 (50.5)	51 (49.5)
36 (83.7)	7 (16.3)	36 (83.7)	7 (16.3)	36 (83.7)	7 (16.3)	29 (67.4)	14 (32.6)
84 (75.7)	27 (24.3)	80 (72.1)	31 (27.9)	85 (76.6)	26 (23.4)	66 (59.5)	45 (40.5)
102 (65.8)	53 (34.2)	108 (69.7)	47 (30.3)	116 (74.8)	39 (25.2)	77 (49.7)	78 (50.3)
85 (83.3)	17 (16.7)	81 (79.4)	21 (20.6)	81 (79.4)	21 (20.6)	70 (68.6)	32 (31.4)
40 (81.6)	9 (18.4)	36 (73.5)	13 (26.5)	43 (87.8)	6 (12.2)	38 (77.6)	11 (22.4)
147 (70.7)	61 (29.3)	153 (73.6)	55 (26.4)	154 (74.0)	54 (26.0)	109 (52.4)	99 (47.6)
71 (76.3)	22 (23.7)	70 (75.3)	23 (24.7)	77 (82.8)	16 (17.2)	56 (60.2)	37 (39.8)
116 (70.7)	48 (29.3)	119 (72.6)	45 (27.4)	120 (73.2)	44 (26.8)	91 (55.5)	73 (44.5)
47 (88.7)	6 (11.3)	40 (75.5)	13 (24.5)	43 (81.1)	10 (18.9)	39 (73.6)	14 (26.4)
140 (68.6)	64 (31.4)	149 (73.0)	55 (27.0)	154 (75.5)	50 (24.5)	108 (52.9)	96 (47.1)
158 (71.8)	62 (28.2)	161 (73.2)	59 (26.8)	170 (77.3)	50 (22.7)	128 (58.2)	92 (41.8)
29 (78.4)	8 (21.6)	28 (75.7)	9 (24.3)	27 (73.0)	10 (27.0)	19 (51.4)	18 (48.6)

diseases and their families. Differences were observed for each item of the nursing practice environment, partly as a result of difficulties in identifying patients' precise stage of disease. In the terminal stage, when patients often need decisions on the use of respirators, the course of chronic respiratory diseases is characterized by the repetition of exacerbation, which gradually causes organ dysfunction and leads to death. It can therefore be difficult to identify whether patients are in acute

exacerbation or have reached the terminal stage, resulting in several problems. In clinical practice, physicians are responsible for determining the appropriate timing for explaining the condition to patients. Patients need continuous support after this explanation, and their condition should also be monitored. Cooperation between various professionals is therefore important, and nursing care must be provided using a multidisciplinary approach, which includes help from the outpatient department

**Table-2** Odds ratios and 95% confidence intervals for relationships between scores for the Practice Environment Scale of the Nursing Work Index (PES-NWI), characteristics of 257 nurses, and their self-rated ability to deliver nursing care to patients with chronic respiratory diseases: results of stepwise logistic regression analysis (variable increase method, likelihood ratio)

Characteristics	Understanding disease	Understanding patients	Respiratory rehabilitation	Helping patients and families	Protecting the rights of patients and families	Cooperating with other health workers	Being a role model
Age group (years)							
20-29							
30-39							
≥40							1.95 (1.08-3.54)
Years of nursing experience (years)							
Years of experience working in a respiratory disease unit							
Duty position							
Manager							
Staff/others							
Educational background							
University degree							
Others							
Specialist certification	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)			1.00 (reference)
Not certified	3.08 (1.05-9.03)	2.30 (1.11-4.73)	4.78 (2.39-9.53)	4.13 (1.59-10.71)			2.59 (1.19-5.62)
Certified							
Number of hospital beds							
≥ 500 beds							
Others							
PES-NWI Scores							
Nurse Participation in Hospital Affairs							
Nursing Foundations for Quality of Care							
Nurse Manager Ability, Leadership and Support							
Staffing and Resource Adequacy							
Collegial Nurse-Physician Relations	2.50 (1.46-4.30)	2.94 (1.63-5.29)	3.29 (1.82-5.93)	3.16 (1.75-5.74)	2.23 (1.33-3.74)	2.57 (1.50-4.40)	3.12 (1.62-6.01)

PES-NWI subscales were continuous variables ranging from 1 to 4.

and the respiratory unit.

Nurses' ability to be role models in providing care for patients with chronic respiratory diseases, and providing instructions and consultation for other nursing professionals, varied with each item of the nursing practice environment. It also varied with years of experience in providing care for patients with respiratory diseases, having a specialist qualification, and a favorable relationship between nurses and physicians. These variables are considered important for improving the quality of care provided to patients and establishing a desirable nursing practice environment. This finding is consistent with previous studies<sup>23) 24)</sup>. Kohzuki<sup>24)</sup> conducted a questionnaire survey on patients in Miyagi Prefecture who received home oxygen therapy. In total, 87% of patients who received an explanation of respiratory rehabilitation from their doctor had experienced respiratory rehabilitation, but 91% of patients without the experience of respiratory rehabilitation had not received any explanation of it. In other words, patients who receive an explanation are more likely to participate in rehabilitation<sup>24)</sup>. Patients with chronic respiratory disease and who are malnourished will also receive nutritional guidance from a nutritionist under the direction of a doctor. For nurses to provide quality nursing care for patients with chronic respiratory disease, they therefore need to have good relationships with doctors; the present study confirms this finding.

This study did have several limitations. The number of participants was relatively small, and the survey response rate was also fairly low. Many of the research participants worked for hospitals with 500 beds or more; therefore, the sample may not be representative of all those involved in providing nursing for people with respiratory disease in Japan. The cross-sectional study design also has a possibility of reverse causality. Additionally, as this study did not use a face-to-face questionnaire, the respondents' understanding may have been inaccurate. Although the participants were respiratory unit nurses in many hospitals in Japan, the hospitals were not randomly selected. This might have biased the results to some extent.

To confirm the findings, a further study with more subjects and from a wider range of settings is needed.

## Conclusions

The present results suggest that having a specialist qualification and better relationships between nurses and attending physicians are associated with nurses' self-rated ability to provide high-quality care for patients with chronic respiratory diseases.

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## Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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