

# Factors related to administrative abilities of nurse administrators – focusing on confidence in nursing

**Kyoko SATO**

Department of Nursing  
Shoin University  
Tokyo, Japan  
16s3026@g.iuhw.ac.jp

**Eiko SUZUKI**

Department of Nursing  
International University of Health and Welfare  
Tokyo, Japan  
eikosuzuki@iuhw.ac.jp

**Takae MACHIDA**

Departments of Nursing, Faculty of Health & Medical Care  
Saitama Medical University  
Saitama, Japan  
t\_machi@saitama-med.ac.jp

**Hiroe YANAHARA**

Department of Nursing, Faculty of Nursing  
Shumei University  
Chiba, Japan  
yanahara@mailg.shumei-u.ac.jp

**Abstract—** Purpose: This study aims to identify factors related to the administrative abilities of nurses in education programs for nurse administrators. Methods: We distributed a self-rating questionnaire survey to 1291 nurse administrators in positions equivalent to head nurse in 69 participating hospitals among the 172 hospitals with 300 beds or more in the Kanto and Tokai regions of Japan. The surveyed items are ability in nurse administration, demographic characteristics, and workplace environment. Results: We received 984 (76.2%) responses. Excluding responses that included two or more choices to a question and where there was no response to questions of gender and administrative abilities, this left 880 (68.2%) responses which were considered valid and these were included in the further analysis. We performed a multiple regression analysis with the focus on confidence in nursing. Here, the nurse administrators who showed better administrative abilities reported that ‘I am decisive’, ‘My judgment in nursing is appropriate’, ‘I read books about new nursing and medical care developments’, ‘I can demonstrate my ability in this job’, ‘I fulfill my responsibilities to achieve goals in accordance with my beliefs’, ‘The present ward (department) has an active atmosphere that makes work enjoyable’, and ‘I work with an awareness of work-life balance (WLB)’. Nurse administrators who showed poorer administrative abilities reported that ‘I became less kind to people since I became a nurse’. Conclusion: The findings suggest that nurse administrators who are confident in themselves and their decision making abilities, who fulfill their responsibilities in accordance with their beliefs, who think their workplace culture is good, and who work with an awareness of WLB may have better administrative abilities. In addition, nurse administrators with low cynicism (developing negative attitudes) scores, a subscale of the burnout score, appear to have better administrative abilities. Education programs for nurse administrators need to include support that enables nurse administrators to work reliably with an awareness of WLB, in the efforts to improve the workplace environment, and ensure that they are prevented from developing cynical attitudes.

**Keywords;** nurse administrator; training; administrative ability of nurses

## I. INTRODUCTION

In the present rapidly aging society of Japan, nurse administrators have to be equipped with strong abilities to cope with diversified and complicated medical care, responding to the reports that it is very important to train nurse administrators to provide nursing that is met with high satisfaction by patients [1]. For the education of nurse administrators, the Ministry of Health and Welfare and the Ministry of Education have provided nursing management seminars since 1960. To respond to the requirements for this, the Japan Nursing Association established the framework for Certified Nurse Administrators in 1992, and established systematic education arrangements and have provided workshops for nurse administrators since the following year. Screening for certification started in 1999, and to date 3,760 graduates from these activities have become qualified as Certified Nurse Administrators (as of November 23, 2018, Japanese Nursing Association) [2]. In 2012, the “Standard for continuous education ver. 2” for nursing staff including nurse administrators was created, requiring organizational efforts and self-study to further train nurse administrators and improve their skills [3].

With this background, nurse administrators are required to be equipped with administrative abilities, and measures to ensure this have been taken. Studies on administrative abilities of nurses have also appeared, including studies of the educational effect of workshops for nurse administrators [4]-[6], and reports on improvements for administrative staff in clinical settings [7][8]. There are also studies that have investigated factors related to administrative abilities, reporting differences in age, length of nursing experience,

position, education for certified nurse administrators, experience as a head nurse, and willingness and aptitude towards this work as factors related to administrative abilities [9]-[12]. However, there are few studies that have systematically investigated all of these factors together, and no longitudinal studies have reported on factors related to administrative abilities.

With this background, we performed a multiple regression analysis to identify factors related to administrative abilities of nurse administrators, hoping to contribute to the improvement of education programs and methods for nurse administrators in clinical settings, as well as to contribute to the development of workplace environments where nurses will wish to continue to work [13]. Here, the variables extracted from the analysis suggest that confidence in themselves plays a role in the background to the administrative abilities of nurse administrators. Because the present study is a self-rating questionnaire survey, we hypothesized that those who have confidence in themselves tend to rate themselves highly. For this reason, we performed additional analyses focusing on the confidence of nurses and discuss details of this in the paper.

## II. METHODS

### A. Participants and survey procedures

#### 1) Participating hospitals

We selected 172 hospitals in the Kanto and Tokai regions with 300 beds or more operated by national research and development institutes, national hospitals, national universities, private education institutions, municipalities, and “A”, a private organization, which are members of the Japan Hospital Association or listed in the directory of hospitals in Japan. We contacted these selected hospitals, explaining the outline of the study (the significance of the study, ethical consideration, intention not to use the data for other purposes) to nurse administrators of the hospitals in writing and orally, and obtained cooperation and agreement to participate in the study from 65 hospitals. Adding 4 university hospitals where contact was established and cooperation obtained in the process of developing the study, finally led to 1291 participants who are head nurses or in positions above this in responsibility in the 69 hospitals to be enrolled in the study.

#### 2) Survey period

February to April, 2017

#### 3) Procedures

We requested nurse directors to hand out self-rating anonymous questionnaires to head nurses, along with a leaflet that explained the study purpose, methods, and ethical considerations. The participating head nurses were asked to post the completed questionnaire in an envelope provided with the questionnaire, sealed, in a collection bag prepared in each nursing department. Some questionnaires were received by mail. We grouped the administrative abilities and variables considered to affect the abilities of head nurses and staff in equivalent positions and analyzed the data to identify factors related to the administrative abilities of these nurses.

### B. Operational definition of terms

“Nurse administrator” is defined as staff in middle management posts in a healthcare facility in charge of a department or ward, equivalent to head nurse or above. “Administrative abilities” are defined comprehensively as the abilities required to conduct and direct nursing activities to support nursing care to provide improvements in the nursing of patients [11].

### C. Question items

1) *Demographic characteristics*: age, date of birth, gender, marital status, presence of children or grandchildren, occupation, length of working in the hospital, length of nursing experience, position, length of working as a head nurse, and academic background (nursing or other)

#### 2) 20 items for administrative abilities of head nurses

A “Scale for administrative abilities of nurse administrators (2006)” [11] developed by Mutsuko Michihiro et al. was used.

#### 3) 22 items of support from superior:

A “Scale for recognition behavior from head nurse (2014)” [14] developed by Takako Hagimoto et al. was used.

#### 4) Factors related to administrative abilities

a) *Personal factors, 14 items*: willingness toward performing the work, satisfaction, confidence in providing appropriate nursing, aptitude and achievement in the administrative work, educational needs as nurse administrators, assertiveness, burnout, job commitment, work life balance, desire for improvement, personality (insensitive to criticism, diplomatic, nervous, cooperative, resilient, with good communication skills, and fairness).

b) *Workplace factors, 12 items*: clinical field before assuming the administrative position, experience of participation in workshops for administrators held outside the hospital, academic society participation, experience of taking examinations for promotion, presence of a role model, support related to work, and 6 items for nurse directors asked when we requested participation in the study (presence of workshop for nursing administrative staff, and its number of hours (duration), examination for promotion to nurse administrators, established steps for promotion to/in managerial positions, arrangements to support nurse administrators, presence of a personnel evaluation framework).

### D. Statistical analysis

(1) We calculated the frequencies and the mean of the total score of administrative abilities of nurses by demographic characteristic to identify the characteristics of participants. (2) We determined differences in the mean total scores of nurse administrative abilities depending on personal factors, support from superiors (recognition behaviors), and workplace factors. For explanatory variables with interval scales, correlation with the total scores of administrative abilities was also calculated. To determine statistically significant differences, we performed t-tests, one-way analysis of variance, and the multiple comparison of Tukey. (3) To determine the factors related to

administrative abilities of nurses, we performed a multiple regression analysis using the total scores of the administrative abilities as the objective variable, and variables with significance levels below 0.05 by univariate analysis and with correlation coefficients above  $\pm 0.2$  as explanatory variables, we performed a multiple regression analysis (Stepwise method) to select these variables. (4) In the multiple regression analysis, ordinal scales were converted to binary scales. To avoid multiple collinearity, we excluded 'the person of the role model', 'age', and 'experience of participating in workshops for administrators' from the explanatory variables. (5) We excluded two items 'I think I can demonstrate my ability in this job' and 'I think my judgment in nursing is appropriate' from the multiple regression analysis, because self-confidence may play a role in the reasons for the quality of administrative abilities in nurse administrators. (6) For the statistical analysis, SPSS Statistics 25 was used.

#### E. Ethical considerations

When applying for permission to conduct the study, we explained the outline of the study to the nurse directors of the participating hospitals in writing and orally. We requested nurse directors to hand out self-rating anonymous questionnaires to head nurses, along with the leaflet that explains the study purpose, methods, ethical considerations and that anonymity is guaranteed in the publication of the study results. It was also explained that data will be statistically processed and will not be used for other purposes than specified in this study, that the participation, withdrawal, and discontinuation of participation are entirely voluntary, and that refusal to participate, or discontinuation after the consent to the participation will not result in any disadvantage to the participant deciding to discontinue the cooperation.

Further, based on the Helsinki Declaration and the Ethical Basic Guidelines on Epidemiological Research by the Ministry of Education, Culture, Sports, Science and Technology, we promised that close attention would be paid to protecting the personal information provided, and asked the participants to deposit the questionnaire, sealed, in a specified collection bag. Further, it was also explained that there was no obligation to submit a filled in questionnaire in the collection bag in case of any disagreement, and that returning the questionnaire would be regarded as consent to the participation. We obtained approval to conduct the study from the Ethics Committee of the institution the authors belong to (No. 16-Ig-128. February, 2017).

### III. RESULTS

We collected 984 responses (76.2%). Of these, responses that included two or more choices to a question and where there was no response to questions of gender and administrative abilities were excluded, resulting in 927 responses (71.8%) determined to be valid. Of the 927, we excluded male respondents as the mean values of administrative abilities of the males were significantly lower than those of the females, and finally included 880 female respondents (68.2%) in the analysis.

#### A. Demographics of the participants and administrative abilities of nurses

The mean total score of administrative abilities of the participants with certification was higher than that of participants without certification. The mean total score of the participants who are Certified Nurse Administrators and who are certified counselors was higher than those without these certificates. There were also significant differences in the final academic background and position ( $p < .01$ ) (Table 1).

#### B. Thoughts and considerations on nursing and administrative abilities of nurses

The mean total score of administrative abilities of the 'thoughts and consideration on nursing' questions was higher in the following participants: those who are aware of work-life balance; who make it a rule to look back on their own behaviors; who control the own emotions; who interact with other persons in a friendly manner; who think that the present ward (department) has an active atmosphere that makes work enjoyable; who are very satisfied with the nursing staff in their department; who are aiming to become nurse managers; who think themselves insensitive to criticism; and who read newly published books related to nursing and medical care ( $p < .01$ ) (Table 2).

#### C. Workplace factors and administrative abilities of nurses

The mean total score of administrative abilities by workplace factors was higher in the following participants whose previous clinical area before assuming the present position was pediatric wards ( $p < .005$ ), outpatient ( $p < .001$ ), or administrative departments ( $p < .001$ ). The mean total score of the participants who had participated in the following activities was higher than those who had not participated in them: workshops for administrators held outside the hospital ( $p < .005$ ), second and third levels of Certified Nurse Administrator Training, other kinds of workshops for administrators, teacher training courses, workshops for counseling and coaching, and training that seemed of help in their work ( $p < .001$ ). The mean total score was higher for the following participants: who had a role model among administrators ( $p < .001$ ); and who were able to consult with an immediate superior ( $p < .001$ ), juniors ( $p < .005$ ), and family ( $p < .001$ ). For the score by the organization operating the hospitals, medical institutions operated by the private organization A showed higher scores than other hospitals ( $p < .001$ ), and by the number of beds, hospitals with 500 beds or more had significantly higher scores than hospitals with fewer than 500 beds ( $p < .005$ ).

#### D. Variables of the interval scale of the age, length of nursing experience, length of working in the present hospital, length of working in the present position, thoughts and considerations on nursing, and administrative abilities

There were relationships with administrative abilities for all the interval scales in this study excluding one item, 'I think I am nervous'. Moderate levels of correlation were found in the participants who feel worth in doing the job; who think their decisions in nursing are correct; who are decisive; who think

**Table 1 Demographic characteristics and the mean total score of administrative abilities**

N=880

Demographic characteristics		Number	(%)	Mean	SD
<b>Gender</b>					
Female		<b>880</b>	( 100.0 )	<b>64.5</b>	<b>8.7</b>
<b>Certificate</b>					
Certified nurse administrator	Yes	<b>70</b>	( 8.0 )	<b>67.5</b>	<b>8.3</b> **
	No	<b>666</b>	( 75.7 )	<b>64.3</b>	<b>8.8</b>
Certified nurse	Yes	<b>72</b>	( 8.2 )	<b>64.6</b>	<b>8.4</b>
	No	<b>664</b>	( 75.5 )	<b>64.6</b>	<b>8.9</b>
Certified nurse specialist	Yes	<b>8</b>	( 0.9 )	<b>64.3</b>	<b>6.9</b>
	No	<b>728</b>	( 82.7 )	<b>64.6</b>	<b>8.8</b>
Nurse practitioner	Yes	<b>3</b>	( 0.3 )	<b>56.0</b>	<b>4.6</b>
	No	<b>733</b>	( 83.3 )	<b>64.6</b>	<b>8.8</b>
Counselor	Yes	<b>6</b>	( 0.7 )	<b>73.2</b>	<b>6.6</b> **
	No	<b>730</b>	( 83.0 )	<b>64.5</b>	<b>8.8</b>
None of the above	Yes	<b>582</b>	( 66.1 )	<b>64.2</b>	<b>8.8</b> **
	No	<b>154</b>	( 17.5 )	<b>66.1</b>	<b>8.6</b>
No answer		<b>144</b>	( 16.4 )		
<b>Final Education</b>					
Nursing vocational school		<b>603</b>	( 68.5 )	<b>63.97</b>	<b>8.74</b> **
Nursing junior college		<b>116</b>	( 13.2 )	<b>63.22</b>	<b>8.83</b>
Nursing University		<b>22</b>	( 2.5 )	<b>64.82</b>	<b>8.56</b>
Nursing graduate school		<b>53</b>	( 6.0 )	<b>67.06</b>	<b>6.95</b>
Non-nursing department of university or graduate school		<b>84</b>	( 9.5 )	<b>68.75</b>	<b>8.22</b>
No answer		<b>2</b>	( 0.2 )		
<b>Position</b>					
Head nurse / Chief nurse		<b>792</b>	( 90.0 )	<b>64.9</b>	<b>8.7</b> **
Assistant head of nursing department / division / section		<b>16</b>	( 1.8 )	<b>66.3</b>	<b>6.5</b>
Head / assistant head / supervising nurse		<b>66</b>	( 7.5 )	<b>60.5</b>	<b>7.9</b>
No answer		<b>6</b>	( 0.7 )		

One-way analysis of variance for 3 groups or more, t-test for 2 groups

\* $p < .05$ , \*\* $p < .01$

they are suited for the present position; who think themselves assertive; and who are able to demonstrate their ability through their work. Correlation coefficients for these were  $r = 0.42$ ,  $0.56$ ,  $0.58$ ,  $0.52$ ,  $0.47$ , and  $0.52$  ( $p < .01$ ), respectively. Correlation coefficients with emotional exhaustion and a cynicism ('I feel disappointed with my work' and 'I became less kind to patients since I became a nurse'), which are a subscale of the burnout score, were  $r = -0.23$  and  $-0.27$  ( $p < .01$ ), respectively, showing a weak negative correlation. The correlation coefficient with support from superiors (recognition behaviors) was  $r = 0.17$  ( $p < .01$ ), a value showing little correlation (Table 2).

*E. Factors related to the administrative abilities of nurses by the multiple regression analysis*

As a result of the multiple regression analysis, a regression equation based on 12 explanatory variables was determined, and the adjusted coefficient of determination was 0.52, accounting for 52% of the variance. The following factors showed strong relationships: I am decisive ( $\beta = 0.18$ ,  $p < .001$ ); I think my judgment in nursing is appropriate ( $\beta = 0.16$ ,  $p < .001$ ); I read newly published books related to nursing and medical care ( $\beta = 0.14$ ,  $p < .01$ ); I think I can demonstrate my ability in this job ( $\beta = 0.12$ ,  $p < .01$ ); I fulfill my responsibilities to achieve goals in accordance with my beliefs ( $\beta = 0.11$ ,  $p < .01$ ); I became less kind to patients since I became a nurse ( $\beta = -0.11$ ,  $p < .01$ ); and I belong to academic societies and study groups ( $\beta = 0.10$ ,  $p < .01$ ).

Table 2 Correlation coefficients between continuous variables and administrative ability score

N = 880						
	N	Mean	SD	Minimum	Maximum	Correlation coefficient
Age	811	50.1	5.7	35	67	.212**
Length of nursing experience	860	28.0	5.8	11	44	.184**
Length of working in the present hospital	865	22.2	10.4	1	44	.099**
Length of working in the present position	856	7.3	5.7	1	32	.201**
Thoughts and considerations on nursing (VAS)						
I feel worth in doing the job every day.	867	62.4	21.2	0	100	.424**
I want to strive to provide better nursing.	860	79.9	16.7	11	100	.399**
I think my judgment in nursing is appropriate.	858	66.2	15.5	8	100	.564**
I am decisive.	857	64.5	19.7	0	100	.579**
I think my hard experiences matured me.	866	76.3	18.0	10	100	.397**
I think I am quick to recover from hardships and difficulties.	859	61.7	22.5	0	100	.357**
I give organizations priority over individual persons when deciding something.	861	62.6	18.1	0	100	.312**
I am suited for the present position.	854	53.3	24.2	0	100	.518**
I think myself assertive.	859	58.4	21.9	0	100	.470**
I can demonstrate my ability in this job.	862	58.7	22.2	0	100	.523**
I am sufficiently rewarded for fulfilling my duties.	860	51.4	23.0	0	100	.132**
I fulfill my responsibilities to achieve goals in accordance with my beliefs.	863	66.5	18.7	0	100	.550**
I feel exhausted when I finish my day's work.	866	74.9	22.4	0	100	-.049
I am disappointed with work.	849	38.6	26.7	0	100	-.228**
I became less kind to patient since I became a nurse.	849	27.1	25.7	0	100	-.271**
I feel happy after doing my best to provide care for patients.	864	81.9	17.7	0	100	.230**
I feel attached to this hospital.	863	67.0	24.0	0	100	.295**
I think I am diplomatic.	856	55.2	24.6	0	100	.296**
I think I am nervous.	856	50.3	24.2	0	100	.042
I am fair and just to everybody.	863	69.4	18.8	7	100	.355**
Support from superiors (recognition)	832	64.1	12.0	22.00	88.00	.170**

\*\*  $p < .01$

For participation in workshops,  $\beta$  (a standard partial regression coefficient that clearly shows the strength of relationship between explanatory and objective variables) was 0.1 or higher, a significant value. Other variables in Table 4 were significant ( $p < .05$ ), but the standard partial regression coefficients were low (Table 3).

*F. Results of the multiple regression analysis, excluding 'I think I can demonstrate my ability in this job'*

As a result of the multiple regression analysis, and excluding 'I think I can demonstrate my ability in this job', the adjusted coefficient of determination was 0.52, accounting for 52% of the variance. The following factors showed strong

relationships: I think I am decisive ( $\beta = 0.25, p < .05$ ); my decisions in nursing are correct ( $\beta = 0.17, p < .01$ ); I read newly published books related to nursing and medical care ( $\beta = 0.15, p < .01$ ); I fulfill my responsibilities to achieve goals in accordance with my beliefs ( $\beta = 0.14, p < .01$ ); I became less kind to patients since I became a nurse ( $\beta = -0.11, p < .01$ ); I belong to academic societies and study groups ( $\beta = 0.11, p < .01$ ); and I think I am fair and just for everyone ( $\beta = 0.11, p < .01$ ). The standard partial regression coefficients of these factors were 0.1 or higher, a significant value. 'The present ward (department) has an active atmosphere that makes work enjoyable' is also a selected variable although the standard partial regression coefficient is low (Table 4).

**Table 3 Factors related to administrative abilities of nurses**

N=880

Explanatory variable	$\beta$	<i>p</i> - value
I am decisive. <sup>a</sup>	0.21	0.000
I think my judgment in nursing is appropriate. <sup>b</sup>	0.16	0.000
I read newly published books related to nursing and medical care. <sup>c</sup>	0.14	0.000
I think I can demonstrate my ability in this job. <sup>d</sup>	0.12	0.005
I fulfill my responsibilities to achieve goals in accordance with my beliefs. <sup>e</sup>	0.11	0.008
I am fair and just to everybody. <sup>f</sup>	0.11	0.001
I became less kind to patient since I became a nurse. <sup>g</sup>	-0.11	0.001
I affiliated to academic societies and research associations <sup>h</sup>	0.10	0.001
Participation in non-institutional workshops for nurse administrators: counseling and coaching workshops <sup>i</sup>	0.08	0.006
Participation in workshops for administrators held outside the hospital : Second level <sup>j</sup>	0.08	0.011
Participation in workshops for administrators held outside the hospital : teacher training courses <sup>k</sup>	0.07	0.018
Experience of clinical fields (before administrator): pediatric ward <sup>l</sup>	0.07	0.028
<b>R<sup>2</sup></b>		0.53
<b>Adjusted R<sup>2</sup></b>		0.52

a : Continuous variables

b : Continuous variables

c : I read newly published books related to nursing and medical care, No = 0, Yes = 1

d : Continuous variables

e : Continuous variables

f : Continuous variables

g : Continuous variables

h : Affiliated to academic societies and research associations: No = 0, Yes = 1

i : Participation in workshops for nurse administrators: counseling and coaching workshops, No = 0, Yes = 1

j : Participation in workshops for nurse administrators: Second level, No = 0, Yes = 1

k : Participation in workshops for nurse administrators: teacher training courses, No = 0, Yes = 1

l : pediatric ward: No = 0, Yes = 1

**Table 4 Results of the multiple regression analysis, excluding ‘I think I can demonstrate my ability in this job’**

N=880

Explanatory variable	$\beta$	<i>p</i> - value
I am decisive. <sup>a</sup>	0.25	0.000
I think my judgment in nursing is appropriate. <sup>b</sup>	0.17	0.000
I read newly published books related to nursing and medical care. <sup>c</sup>	0.15	0.000
I fulfill my responsibilities to achieve goals in accordance with my beliefs. <sup>d</sup>	0.14	0.001
I became less kind to patient since I became a nurse. <sup>e</sup>	-0.11	0.000
I affiliated to academic societies and research associations <sup>f</sup>	0.11	0.000
I am fair and just to everybody. <sup>g</sup>	0.10	0.002
Participation in non-institutional workshops for nurse administrators: counseling and coaching workshops <sup>h</sup>	0.09	0.004
Participation in workshops for administrators held outside the hospital : Second level <sup>i</sup>	0.09	0.007
Participation in workshops for administrators held outside the hospital : teacher training courses <sup>j</sup>	0.07	0.017
The present ward has an active atmosphere that makes work enjoyable <sup>k</sup>	0.06	0.043
<b>R<sup>2</sup></b>		0.53
<b>Adjusted R<sup>2</sup></b>		0.52

a : Continuous variables

b : Continuous variables

c : I read newly published books related to nursing and medical care, No = 0, Yes = 1

d : Continuous variables

e : Continuous variables

f : Affiliated to academic societies and research associations: No = 0, Yes = 1

g : Continuous variables

h : Participation in workshops for nurse administrators: counseling and coaching workshops, No = 0, Yes = 1

i : Participation in workshops for nurse administrators: Second level, No = 0, Yes = 1

j : Participation in workshops for nurse administrators: teacher training courses, No = 0, Yes = 1

k : The present ward has an active atmosphere that makes work enjoyable, No = 0, Yes = 1

**Table 5 Results of the multiple regression analysis, excluding ‘My decisions in nursing are correct’**

N=880

Explanatory variable	$\beta$	<i>p</i> -value
I am decisive. <sup>a</sup>	0.29	0.000
I read newly published books related to nursing and medical care. <sup>b</sup>	0.15	0.000
I think I can demonstrate my ability in this job. <sup>c</sup>	0.14	0.001
I fulfill my responsibilities to achieve goals in accordance with my beliefs. <sup>d</sup>	0.14	0.001
I am fair and just to everybody. <sup>e</sup>	0.13	0.000
I became less kind to patient since I became a nurse. <sup>f</sup>	-0.11	0.001
I affiliated to academic societies and research associations <sup>g</sup>	0.11	0.001
Participation in non-institutional workshops for nurse administrators: counseling and coaching workshops <sup>h</sup>	0.09	0.006
Participation in workshops for administrators held outside the hospital : teacher training courses <sup>i</sup>	0.08	0.013
Participation in workshops for administrators held outside the hospital : Second level <sup>j</sup>	0.07	0.020
Experience of clinical fields (before administrator): pediatric ward <sup>k</sup>	0.07	0.029
<b>R<sup>2</sup></b>		0.52
<b>Adjusted R<sup>2</sup></b>		0.51

a : Continuous variables

b : I read newly published books related to nursing and medical care, No = 0, Yes = 1

c : Continuous variables

d : Continuous variables

e : Continuous variables

f : Continuous variables

g : Affiliated to academic societies and research associations: No = 0, Yes = 1

h : Participation in workshops for nurse administrators: counseling and coaching workshops, No = 0, Yes = 1

i : Participation in workshops for nurse administrators: teacher training courses, No = 0, Yes = 1

j : Participation in workshops for nurse administrators: Second level, No = 0, Yes = 1

k : pediatric ward: No = 0, Yes = 1

**Table 6 Results of the multiple regression analysis, excluding ‘I think I can demonstrate my ability in this job’**

N=880

Explanatory variable	$\beta$	<i>p</i> -value
I am decisive. <sup>a</sup>	0.33	0.000
I fulfill my responsibilities to achieve goals in accordance with my beliefs. <sup>b</sup>	0.18	0.000
I read newly published books related to nursing and medical care. <sup>c</sup>	0.16	0.000
I am fair and just to everybody. <sup>d</sup>	0.13	0.000
I became less kind to patient since I became a nurse. <sup>e</sup>	-0.12	0.000
I affiliated to academic societies and research associations <sup>f</sup>	0.11	0.000
Participation in non-institutional workshops for nurse administrators: counseling and coaching workshops <sup>g</sup>	0.09	0.005
Participation in workshops for administrators held outside the hospital : teacher training courses <sup>h</sup>	0.08	0.008
Participation in workshops for administrators held outside the hospital : Second level <sup>i</sup>	0.07	0.032
Academic background: Other university/graduate school <sup>j</sup>	0.06	0.045
I am working with awareness of work life balance <sup>k</sup>	0.06	0.043
<b>R<sup>2</sup></b>		0.52
<b>Adjusted R<sup>2</sup></b>		0.51

a : Continuous variables

b : Continuous variables

c : I read newly published books related to nursing and medical care, No = 0, Yes = 1

d : Continuous variables

e : Continuous variables

f : Affiliated to academic societies and research associations: No = 0, Yes = 1

g : Participation in workshops for nurse administrators: counseling and coaching workshops, No = 0, Yes = 1

h : Participation in workshops for nurse administrators: teacher training courses, No = 0, Yes = 1

i : Participation in workshops for nurse administrators: Second level, No = 0, Yes = 1

j : Academic background: Nursing vocational school, nursing junior college, nursing college, nursing graduate school = 0 Other university/graduate school = 1

k : I work with an awareness of WLB: No = 0, Yes = 1

*G. Results of the multiple regression analysis, excluding 'My decisions in nursing are correct'*

As a result of the multiple regression analysis, after excluding 'My decisions in nursing are correct', the adjusted coefficient of determination was 0.51, accounting for 51% of the variance. The following factors showed strong relationships: I think I am decisive ( $\beta = 0.29, p < .01$ ); I read newly published books related to nursing and medical care ( $\beta = 0.15, p < .01$ ); I think I can demonstrate my ability in this job ( $\beta = 0.14, p < .01$ ); I fulfill my responsibilities to achieve goals in accordance with my beliefs ( $\beta = 0.14, p < .01$ ); I think I am fair and just towards everyone ( $\beta = 0.13, p < .01$ ); I became less kind to patients since I became a nurse ( $\beta = -0.11, p < .01$ ); and I belong to academic societies and study groups ( $\beta = 0.11, p < .01$ ). The standard partial regression coefficients of these factors were 0.1 or higher, a significant value (Table 5).

*H. Results of the multiple regression analysis, excluding 'I think I can demonstrate my ability in this job' and 'My decisions in nursing are correct'*

As a result of the multiple regression analysis, after excluding 'I think I can demonstrate my ability in this job' and 'My decisions in nursing are correct', the adjusted coefficient of determination was 0.51, accounting for 51% of the variance. The following factors showed strong relationships: I think I am decisive ( $\beta = 0.33, p < .01$ ); I fulfill my responsibilities to achieve goals in accordance with my beliefs ( $\beta = 0.18, p < .05$ ); I read newly published books related to nursing and medical care ( $\beta = 0.16, p < .01$ ); I think I am fair and just towards everyone ( $\beta = 0.13, p < .01$ ); I became less kind to patients since I became a nurse ( $\beta = -0.12, p < .01$ ); and I belong to academic societies and study groups ( $\beta = 0.11, p < .01$ ). The standard partial regression coefficients of these factors were 0.1 or higher, a significant value. Academic background and awareness of WLB is an additionally selected variable although the standard partial regression coefficient is low (Table 6).

*I. Variables selected in common with the four multiple regression analyses above*

Factors related to administrative abilities of nurses selected in common with the four multiple regression analyses above include: I think I am decisive, I fulfill my responsibilities to achieve goals in accordance with my beliefs, I read newly published books related to nursing and medical care, I think I am fair and just towards everyone, I became less kind to patients since I became a nurse, I belong to academic societies and study groups, and I participated in workshops for administrators (second and third levels of Certified Nurse Administrator Training, teacher training courses, workshops for counseling and coaching).

*A. Characteristics of the study population*

This study focused on 69 hospitals with 300 beds or more in the Kanto and Tokai regions operated by national research and development institutes, national hospitals, national universities, private education institutions, municipalities, and a private organization A. A breakdown of the hospitals by the organization operating the facility (operating body) is as follows: 12 national research and development institutes and national hospitals, 17 municipally operated, 7 medical institutions operated by the private organization A, and 33 national university and private educational institutions. A significant difference was found in the mean total scores of administrative abilities among the different operational categories. For this reason, we added the operating body to the explanatory variables of the multiple regression analysis.

1) *Decisiveness (readiness to decide), confidence in nursing, and beliefs*: Participants who reported that I think I am decisive and I fulfill my responsibilities to achieve goals in accordance with my beliefs had better administrative abilities. This result is similar to that in our previous study [13]. Participants who express confidence in nursing had better administrative abilities. Michihiro et al. (2006) investigated general nurses and nurse administrators who were participating in workshops organized by the nursing association, and reported that having confidence in nursing increases administrative abilities [11]. This result is similar to that in our previous study which focused on nurse administrators [13]. Therefore, this clearly shows that in the case of nursing administrative staff, stronger confidence in nursing may be linked to better administrative abilities. Participants who are decisive, who have confidence in nursing, and who fulfill their responsibilities to achieve goals in accordance with their beliefs may have better administrative abilities.

2) *Satisfaction*: Participants who reported that 'I think I can demonstrate my ability in this job' had better administrative abilities. In our previous study [13], we reported that nurses with high job satisfaction levels have better administrative abilities. We also obtained similar results in the present study. This illustrates that nurses who think they can demonstrate their ability in the present job have better administrative abilities.

3) *Skill in collecting information*: In this study participants who reported that 'I read newly published books related to nursing and medical care' had better administrative abilities. In our previous study [13], we reported the relationship between the skills to collect information and administrative abilities. We obtained similar results for these items in the present study, and this suggests that nurses who read newly published books related to nursing and medical care do have better administrative abilities.



4) *Cynicism*: In this study participants who reported that ‘I became less kind to patients since I became a nurse’ had poorer administrative abilities. Nishibori et al. analyzed the results of burnout subscales targeting non-administrative staff including chief, assistant chief, and subhead nurses in public hospitals, and reported that being at higher positions tends to suppress this kind of cynicism [15]. In our previous study [13], we reported the negative relationship between cynicism and administrative abilities. We also obtained similar results in the present study. This suggests that the lower the score in cynicism the better the administrative abilities.

5) *Fairness and justice*: In this study participants who reported that ‘I think I am fair and just towards everyone’ had better administrative abilities. In our previous study [13], we reported that nurses who think themselves fair and just towards everyone had better administrative abilities. The present study showed similar results and this suggests that nurses who think themselves fair and just towards everyone have better administrative abilities.

6) *Participation in academic societies and study groups*: In this study participants who reported that ‘I belong to academic societies and study groups’ had better administrative abilities. In our previous study [13], we reported that nurses who belong to academic societies and study groups had better administrative abilities. We obtained similar results in the present study, suggesting that nurses who belong to academic societies and study groups have better administrative abilities.

7) *Participation in workshops/training*: In this study participants who had participated in workshops for counseling and coaching, second level of Certified Nurse Administrator Training, and teacher training courses had better administrative abilities. Nakagiri et al. investigated administrative abilities of nurses who completed nursing administrative training, and reported that the administrative skills of participants in the second level were better than those of the first level participants [16]. In our previous study [13], we reported the relationship between the participation in these workshops and administrative abilities. We obtained similar results here. We have not located studies that investigated the relationship between the participation in teacher training courses and administrative abilities. However, as skills in teacher training are important skills for administrators taking on the roles of administrators, it may be inferred that participants in teacher training would have better administrative abilities.

8) *Comparison of the results of three multiple regression analyses that exclude ‘I think I can demonstrate my ability in this job’ and ‘My decisions in nursing are correct’, that excludes only ‘I think I can demonstrate my ability in this job’, and that excludes only ‘My decisions in nursing are correct’*: The items ‘I think I can demonstrate my ability in this job’ and ‘I think my judgment in nursing is appropriate’ may be affected by the attitude that nurse administrators may have

confidence in their administrative abilities. Because the present study is a self-rating questionnaire survey, we hypothesized that those who have confidence in themselves tend to rate themselves highly. For this reason, we performed multiple regression analyses by excluding these two items.

- (1) Multiple regression analysis that excluded ‘I think I can demonstrate my ability in this job’ showed a new factor affecting administrative abilities, workplace climate that allows nurses to work comfortably.
- (2) Multiple regression analysis that excluded ‘My decisions in nursing are correct’ showed similar variables as with factors related to administrative abilities.
- (3) As a result of the multiple regression analysis that excluded both ‘I think I can demonstrate my ability in this job’ and ‘My decisions in nursing’, it was suggested that academic background and awareness of WLB are closely related to better administrative abilities.

These findings suggest that the satisfaction level at which nurses feel they can demonstrate their ability in nursing, workplace climates that allow nurses to work comfortably, and awareness of WLB may be confounding factors.

#### B. Limitations of the present study and issues to be addressed in future studies

As this study focused on a specific population working in hospitals with 300 beds or more in the Kanto and Tokai regions of Japan, there are limitations on how far it is meaningful and acceptable to generalize the findings. Further, as this is a cross-sectional study, we could not clarify the causal relationship of administrative abilities. To overcome these limitations, we need to conduct longitudinal studies to determine factors affecting administrative abilities by expanding the survey areas and the number of participants and by improving the collection rate.

## V. CONCLUSIONS

We conducted this study to identify factors related to the administrative abilities of administrative and supervisory nursing staff working in hospitals with 300 or more beds in the Kanto and Tokai regions of Japan. The findings from the results of the analysis are summarized as below:

- (1) The main factors related to administrative abilities found by the multiple regression analysis include decisiveness, confidence in nursing, beliefs, job satisfaction, skills in collecting information, fairness/justice, cynicism, and participation in academic societies and study groups for nurse administrators.
- (2) Nurse administrators with low cynicism (only little of negative attitudes) scores, a subscale of the burnout score, appear to have better administrative abilities. This shows the necessity for developing measures to prevent nurse administrators from developing cynical attitudes.
- (3) It was suggested that nurse administrators who feel their workplace climate easy to work in and who work with an

awareness of WLB may have better administrative abilities. This would make it necessary to provide support that enables nurse administrators to work assuredly with an awareness of WLB.

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#### AUTHORS



Ms. Kyoko Sato, Certified nursing administrator. Master of Business Administration (MBA). She currently teaches Adult Nursing at Shoin University.



Takae Machida, Assistant Professor, master’s degree of Nursing management. Saitama Medical University, Japan



Ms. Eiko Suzuki, obtained her Phd of Science in Nursing at Tokyo Medical and Dental University. She currently professor at International University of Health and Welfare Graduate School.



Ms. Hiroe Yanahara, obtained her Bachelor of Science in Nursing at Kurume University in 1998 and passed the Nursing and Public health nursing Licensure Examination on the same year. After working in a hospital for 9 years she worked as a public health nurse and a visiting nurse. She currently teaches Home Care Nursing at Shumei University.