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Influence of Emotional Intelligence, Communication, and Organizational Commitment on Nursing Productivity among Korean Nurses

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Purpose: Improving productivity in nursing practice is an important issue. This study investigated factors affecting nursing productivity of Korean clinical nurses. **Methods:** A structured survey tool was used in a cross-sectional design with a convenience sample of 239 nurses working in university hospitals. Stepwise multiple regressions were done to identify influential factors. **Results:** The level of nursing productivity was at a moderate level (3.3 out of 5). Those nurses who were over 36, married, over master-graduated, regularly employed, on day duty, and with experiences as a charge or head nurse reported better achievements in nursing productivity than the other groups of nurses. All three independent variables, age, and employment status explained 55.4% of the variance in nursing productivity. **Conclusion:** The leaders and managers of nursing organizations should develop educational programs aimed at increasing nurses' competencies in relation to emotion controls and communication skills, which consequently should improve nursing productivity.

Key Words: Nurses; Communication; Emotional intelligence

INTRODUCTION

I. Introduction

It is widely recognized that the nursing profession has made significant contributions to increase productivity in health care services. During the last fifteen years, nursing productivity has been increased by about 45 times worldwide [1].

The productivity of nurses generally is explained to be achieved in terms of economic labor trends and costs to an organization [2]. Productivity has been commonly associated with efficiency in terms of services provided, costs, material resources, output per input of labor, nurse ratio at the department level and so on and accordingly, has been presented using quantitative measures [2,3]. In addition, productivity produced by nurses or nursing departments overlap and has not clearly been differentiated, making it difficult to develop a coherent understanding of 'productive' nursing practice. We use nursing productivity in the current study.

A nursing productivity model showed that human-related factors including a significant number of nurses with adequate knowledge, skill, and experiences were important components of productivity for 360 Iranian clinical nurses [4]. Similarly, organizational trusts such as loyalty, competency, honesty and stability were multiply correlated with nurse administrators' productivity [5]. In the case of primary care nurse practitioners in ambulatory settings, nursing productivity was associated with some modifiable practice characteristics such as autonomy [6]. In addition, nursing productivity has been examined in relation to nurses' demographic and organization characteristics in the literature. McNeese-Smith and Van Servellen [3] found that older nurses with many nursing experiences and/or a high job satisfaction showed greater productivity. Farhadi et al.[1] reported that nurse productivity was significantly high in nurses who were male,

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married, and attained a bachelor's degree from the nurses' perspective, while the priority factors affecting nursing productivity were clear role perception, knowledge and skills, motivation, performance feedback coaching, organizational support, and environmental adjustment from the head nurses' perspective. As mentioned in above studies, although the variables related to nurses or nursing productivity are different depending on the study purpose or even the perspectives, it is believed that nursing productivity is affected by the overall work environment as well as the characteristics of individual nurses.

In a similar trend, according to the results of studies in Korea, the level of productivity in Korean clinical nurses differed by their individual characteristics such as age, marital status, shift, position, salary, nursing experiences, and educational level [7,8] as well as organizational characteristics such as commitment or internal marketing activities [9-11].

In additions, there have been studies exploring which factors have an impact on the role of nurses in delivering patient care from an organizational perspective such as nurses' level of emotional intelligence, communication skills in practice, and commitment to their organizations [7,11-14]. These variables have contributed to the productivities of nurses by controlling their emotions, effectively communicating with other staff, and committing to the goals of the organizations. A couple of studies have investigated the associations between emotional intelligence and communication and their roles in the accomplishments of the organizations [14,15] or the relatedness between some other variables. However, very few studies have shown associations between these organization-related variables (i.e., emotional intelligence) and productivity in nursing practice. Similarly, little attention has been given to the role of individual characteristics (e.g., age) of Korean clinical nurses in the assessment of work productivity.

2. Purpose

Given this gap in the literature, this study was designed to identify the perceived levels of emotional intelligence, communication, organizational commitment, and nursing productivity, to explore the associations among the four measured variables, and to identify factors substantially predicting nursing productivity among the subjects.

3. Theoretical Background

To date, several models have been used to explain the concept or components of nursing productivity. The original study defining nursing productivity proposed four characteristics: human measures, material resources, patient qualities, and service provided [16]. In this study, the authors concluded nursing productivity is the ratio of output to input, and productivity was most commonly associated with efficiency. The perspectives of North and Hughes [2] are similar to the original definition to some extent. However, North and Hughes [2] took a system approach to nursing productivity, focusing on the importance of nurses and the working environment and proposed to reconceptualize nurses not as a capital asset but as an intellectual asset. Similarly, factors affecting nursing productivity were prioritized based on the ACHIEVE model (ability, clarity, help, incentive, evaluation, environment, and validity) from the perspectives of nurses and head nurses [1]. According to the results expressed by the two groups, nurses and head nurses, the strategies to improve nursing productivity are mainly associated with organizational systems or programs such as orientation, retraining courses, supporting systems and so on. Although these efforts for the conceptual building of nursing productivity were attempted, nursing productivity mostly has been based on the individual needs of patients or a cost-effective care system. It seems clear that factors related to organizations as well as the enhancement of nurse-related resources received very little attention. Therefore, we included variables that would show significant relationships with nurse productivity from organization-based but non-cost-related variables such as nurses' competency in controlling their emotions, communication, and perceived level of their commitments to their organizations in daily nursing practice. It is assumed that the variables selected for this study (i.e., emotional intelligence, communication, and organizational commitment) are appropriate to explain the correlates of nursing productivity in this study, considering this is the first time these variables have been investigated.

METHODS

1. Study Design, Sample, and Setting

An exploratory cross-sectional design was used with a convenience sample of 239 Korean nurses working in three different university hospitals (size, 500~1300 beds). The subjects were registered nurses working in hospitals located in three different areas of Korea. The hospitals were selected based on the author's convenience and university hospitals, which included a variety of clinical depart-

ments. Eligibility criteria for study inclusion were Korean nurses who have been currently working for more than 6 months at their current organizations. Nurses employed in emergency and specialty areas were excluded.

This survey was reviewed and approved by the Institutional Review Board of Jeju National University (IRB No.: JJNU_IRB 20140512-HR-004-01). Data were collected from October 2014 to June 2015. Before administrating the survey, the researcher contacted three hospitals to encourage survey participation and explained to the supervisors at each nursing organization the purpose of the study and the potential benefits for participating. All organizations participated voluntarily in the survey. The subjects were asked to respond to a paper survey which was in an envelope containing the following: a cover letter, questionnaire, consent form, and instructions for completing the survey. Confidentiality and anonymity of the participants were assured by not using real names but rather a participant code. Participants were informed that they were able to drop out of the study at any time.

During the survey period, 246 participants completed the survey with a response rate of 82 percent. Of the 246 responses, 7 cases were excluded due to incomplete responses. Therefore, a total of 239 responses were identified as participants in this study. After completing the survey, all the participants received a small gift (measuring tape). The total numbers included in the data analysis, that was deemed appropriate to ensure statistical significance for the stepwise multiple regressions, was estimated by G* Power 3.0 for Windows (power=80%, α=.05, and effect size=.25).

2. Measures

1) General Characteristics

The general characteristics consisted of two parts: the demographic characteristics of the nurses (gender, age, marital status, and education), and questions related to work experiences and conditions (nursing experiences, employment, shift, position, and working hours).

2) Emotional Intelligence

In the present study, emotional intelligence was assessed using the Wong and Law Emotional Intelligence Scale (WLEIS), an extensively used instrument which measures nurses' intelligence in terms of emotions [17]. In this study, we used the Korean version of the tool [18]. This instrument is composed of 16 items measuring the level of emotional intelligence in four components: self-emotional appraisal (4 items), other's emotional appraisal (4 items), regulation of emotions (4 items), and use of emotions (4 items). To measure a subject's emotional intelligence, a 5-point Likert scale was used ranging from 1 (strongly disagree) and 5 (strongly agree). Higher scores indicated an increased level of emotional intelligence. Cronbach's α was .76~89 [17], and .93 in this study.

3) Communication

The ability to deliver and understand the thinking and emotions of people was measured using Hur [19]'s communication scale (Global Interpersonal Communication Competence Scale, GICC-15). This instrument is composed of 15 items with a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A higher score indicated that nurses were very good at communicating with nurses and other people in their organizations. Its psychometric properties such as content validity, concurrent validity, and convergent validity were assured in the original study [19]. Cronbach's α was .72 [19], and .90 in this study.

4) Organizational Commitment

The Organizational Commitment Questionnaire (OCQ), developed by Mowday et al.[20] and revised by Kim [21], was used to measure the perceived level of Korean nurses' organizational commitment. This instrument is composed of 15 items and uses a 5-point Likert scale format ranging from 1 (strongly disagree) to 5 (strongly agree). A higher score indicated a higher level of nurses' commitment to their current organizations. Cronbach's α was .91 for the current sample.

5) Nursing Productivity

Nursing productivity was measured using an instrument that was originally developed by McNeese-Smith and Van Servellen [3] and translated by Lee [22]. This instrument consists of 15 items and measures nurses' self-assessment of success in meeting productivity indicators, including level of nurses' commitment to the achievement of the goal, reduce costs, labor savings, problem solving, job accuracy, use of sick leave, and resources used. All items were measured by a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Internal consistency was verified by Cronbach's α (=.91) in this study, which was .91 in the original study [3]. A higher score indicated that the nurses' degree of perception on nursing productivity is high.

6) Statistical Analysis

The data were analyzed with the Statistical Package for the Social Science software version 18.0.3 (Chicago, Illi-

nois). *p*-values of <.05 were considered to be statistically significant. Descriptive statistics were used to understand the general characteristics of the sample and the levels of the measured variables. t-tests and analysis of variance were employed to compare nurse productivity according to the selected demographic and work-related characteristics. The associations among the four measured variables were estimated with Person's Correlations. The normality of each variable and the summated mean scale of the measurements were assessed by normal Q-Q plots and Kolmogorov-Smirnov. Stepwise multiple regressions were done to identify factors associated with nursing productivity. Before performing the regression analysis, multicollinearity was confirmed by reviewing the values for the tolerance and the variance inflation factor (VIF=1/tolerance).

RESULTS

1. Descriptive Statistics of the Participants and the Four Variables

Table 1 presents the general characteristics of the sample. Of the 239 subjects, the overwhelming majority were females (99.2%), aged less than 30 years old (39.4%), and unmarried (69.5%). Forty-three percent of nurses attained BSN degrees. Of the 239 subjects, 21.3% had less than 2 years of nursing experience. Many of them worked on a regular basis (95.0%), as rotation duty (94.1%), and as staff (81.6%). About one third of the sample (34.7%) worked more than 50 hours per week.

Table 2 presents the mean scores of the four measurements used. Of them, the highest mean scores were emo-

Table 1. Comparison of Nursing Productivity by Participants Characteristics (*N*=239)

Factors	Characteristics	Categories	n (%)	Nursing productivity		
				M±SD	t or F	*p*
Demographics	Gender	Male	2 (0.8)	3.26±0.47	-0.16	.872
		Female	237 (99.2)	3.31±0.46		
	Age (year)	≤25	89 (7.2)	3.08±0.38[c]	23.33	<.001
		26~30	77 (32.2)	3.37±0.45[b]		
		31~35	47 (19.7)	3.43±0.39[b]		
		≥36	26 (10.9)	3.78±0.34[a]		
	Marital status	Not married	166 (69.5)	3.22±0.44	-5.45	<.001
		Married	73 (30.5)	3.55±0.42		
	Education	Diploma	69 (28.9)	3.16±0.35[a]	11.25	<.001
		BSN	103 (43.1)	3.28±0.48a[c]		
		RN-BSN	38 (15.9)	3.41±0.43[bc]		
		≥Master's	29 (12.1)	3.69±0.41[b]		
Work-related	Total nursing experiences (years, except <6 months)	≤2	51 (21.3)	3.08±0.42	11.68	<.001
		3~5	67 (28.0)	3.25±0.48		
		6~10	66 (27.6)	3.36±0.36		
		≥11	55 (23.0)	3.56±0.44		
	Employment status	Irregular	12 (5.0)	2.88±0.29	-3.45	.001
		Regular	227 (95.0)	3.34±0.45		
	Work shift	Daytime	14 (5.9)	3.96±0.25	5.83	<.001
		Rotation	225 (94.1)	3.28±0.44		
	Current position	Staff	195 (81.6)	3.23±0.44[a]	26.86	<.001
		Charge	33 (13.8)	3.60±0.29[b]		
		Head	11 (4.6)	3.99±0.46[c]		
	Working hours (per week)	40~44	69 (28.9)	3.34±0.42[ab]	3.12	.027
		45~49	87 (36.4)	3.35±0.46[a]		
		50~54	61 (25.5)	3.34±0.48[ab]		
		≥55	22 (9.2)	3.04±0.39[b]		

Post-hoc test: a < b < c; BSN=bachelor in science of nursing; RN-BSN=registered nurse-baccalaureate student nurse.

tional intelligence (3.39±0.44) and communication (3.39±0.47), followed by nursing productivity (3.31±0.46), and organizational commitment (2.92±0.22).

2. Comparison of Nurse Productivity according to General Characteristics

As shown in Table 1, differences in the subjects' nurse productivity were measured according to demographic and work-related characteristics. Overall, nursing productivity was significantly different in the subjects' general characteristics except for gender. Those Korean nurses, who were over 36 years of age ($p<.001$), married ($p<.001$), and over master-graduated ($p<.001$), were more likely to show higher productivity in nursing practice compared to the other groups of nurses. In relation to work-related conditions, nurses who had more than 11 years of nursing experiences ($p<.001$), were regularly employed ($p=.001$) in a hospital, worked in the day time ($p<.001$), was a charge or head nurse ($p<.001$), worked for less than 50 hours per week ($p=.027$) and were more likely to report higher nurse productivity than the nurses in the other groups. There were no specific significant differences between the groups by gender.

3. Correlations among the Measured Variables

Pearson correlation coefficients were calculated to determine the relationships among the four variables (Table 3). Nurse productivity was moderately positively correlated with emotional intelligence (r=.65, $p<.001$), followed by the associations with communication (r=.58, $p<.001$) and organizational commitment (r=.34, $p<.001$). In addition, the other three variables were significantly positively correlated with each other ($p<.001$).

Table 2. Levels of Emotional Intelligence, Communication, Organizational Commitment, and Nursing Productivity

Variables	Min	Max	M±SD
Emotional intelligence	2.06	4.75	3.39±0.44
Communication	2.13	5.00	3.39±0.47
Organizational commitment	2.07	3.73	2.92±0.22
Nursing productivity	2.00	4.67	3.31±0.46

4. Predictive Factors for Nurse Productivity

Stepwise Multiple regressions (enter method) were done to determine the effects of the selected variables included in this study which could have a significant influence on the nurse productivity of the subjects. The final model showed that the five variables (age, employment, emotional intelligence, communication, and organizational commitment) significantly predicted nursing productivity among the sample surveyed (F=27.84, $p<.001$). The model explains 55.4% of the variance in nurse productivity, with most of the variation explained by emotional intelligence (Table 4).

DISCUSSION

Based on the empirical evidence, it seems that previous studies have not yet identified what factors, excepting economic values (i.e., staff ratio and cost), improve practices in nursing which consequently enhance nursing productivity. This current study investigated factors affecting the productivity of Korean clinical nurses and their implications for enhancing nursing practice. Emotional intelligence was the strongest predictor of productivity in Korean nurse, and nursing productivity was associated with nurses' individual characteristics and other organization-related factors in this study.

Factors affecting nursing productivity have been documented in the literature. The factors that have been defined are inconsistent throughout these studies, and different depending on the subjects' specialties such as clinical nurses [4], nurse administrators [5], and nurse practi-

Table 3. Associations among Emotional Intelligence, Communication, Organizational Commitment, and Nursing Productivity

Variables	Emotional intelligence	Communication	Organizational commitment	Nursing productivity
	r (p)	r (p)	r (p)	r (p)
Emotional intelligence	1			
Communication	.81 (<.001)	1		
Organizational commitment	.36 (<.001)	.32 (<.001)	1	
Nursing productivity	.65 (<.001)	.58 (<.001)	.34 (<.001)	1

Table 4. Stepwise Multiple Regression for Factors Affecting Nursing Productivity of Participants (*N*=239)

Variables	B	SE	β	t	*p*	Tolerance	Variance inflation
Age †	0.11	0.04	.24	2.45	.015	.91	1.10
Employment †	0.20	0.09	.10	2.20	.029	.95	1.05
Emotional intelligence	0.34	0.08	.33	4.24	< .001	.32	3.15
Communication	0.22	0.07	.23	3.01	.003	.34	2.96
Organizational commitment	0.19	0.10	.10	2.00	.047	.87	1.15
F=27.84, p < .001, Adjusted R^2=.55							

SE=standard error; † Dummy coded variables; "≥36" is equal to 1 otherwise "0" for age, and regular is equal to "1" otherwise "0" for employment status.

tioners [6], on nurses' negative experiences such as workplace bullying [23], on nurse's quality of work life [24], and organizational characteristics such as organizational trust [5] as well as on the supporting theoretical model for productivity [1,2,4].

The research trends for Korean nurses are similar to those of previous studies. For instance, customer orientation was found to be the most important factor in explaining the variance in the productivity of Korean nurses working at a university hospital (35.3%), providing evidence that a high orientation toward customer (i.e., patient) service was related to the delivery of a high level of healthcare services [8]. Park et al. [25] reported that sleep quality was a significant predictor of nursing productivity, suggesting poor sleep quality may lead to lower nurse productivity. Similarly, experiences of workplace bullying and burnout affected organizational behaviors and nursing productivity [11], which is consistent with the result of Berry et al.[23].

In this study, nursing productivity was moderately significantly correlated with emotional intelligence, followed by communication and organizational commitment (p < .001 for all), confirming the results of previous studies: nursing productivity was positively correlated with emotional intelligence [7], and commitment [11]. Especially, a significant relationship between emotional intelligence and communication appeared to be the most significant finding (r=.81, p < .001) in this study, a finding which is also supported by the literature [14]. From these findings, it is assumed that nurses who are good at controlling their emotions, adequately communicating with other members, which are necessary for the delivery of patient care, and committing to their current organizations will be able to improve their productivity in their nursing practices. Consequently, the high level of those variables may contribute to increasing the level of nursing productivity

In addition, nursing productivity was significantly different according to the demographics and career characteristics in the current study. Regarding the age of nurses, it was observed that the productivity of a nurse was significantly lower in younger nurses in this study as well as in previous studies with similarly aged populations [7, 11]. Similarly, Wei and Richardson [26] showed that older workers are not less productive than the other groups, suggesting that older workers are good substitutes for younger workers. A stronger relationship was observed between age group and nursing productivity; older nurses and a higher commitment to the organization [3]. However, there is a study that showed older nurses had a higher health-related productivity loss than that of younger nurses [27]. Based on these evidences, it is assumed that, beyond the age differences between groups, there might be some other factors affecting nursing productivity such as the nurses' roles (e.g., bedside patient care vs administrative) or type of institution employed at (e.g., nursing home vs hospital) although the age groups were the same [26]. These inconsistent results may suggest the need for further studies investigating other additional underlying factors.

There were a number of limitations associated with this study. First, the target population in this study was limited to nurses from three university hospitals in Korea, resulting in lack of generalizability of the findings. Various sized-samples with multi-institutional backgrounds are needed in future studies. Second, because of the nature of the cross-sectional design used in this study, we were not able to establish causal relationships among the four variables. Additionally, this study did not clearly reveal whether each variable directly affects nurse productivity or whether one of them acts as a mediator which affects the other remaining variables. Future studies using longitudinal designs are strongly recommended.

One of the practical implications of this study is that organization-related but non-cost variables such as emotional intelligence could affect the productivity of Korean nurses in daily practice. Generally, emotional intelligence has only been considered on an individual basis in terms of a nurse's competency in controlling emotions. However, it is also affected by interactions with other staff members or patients, indicating that its development is also associated with the organizational environment as well as the nurse's characteristics. Therefore, the importance of the hospital workplace environment to improve nurses' competencies such as emotional intelligence and communication skills, which in turn, provides quality care, ultimately increases the productive outputs of nurses, needs to be emphasized. Another implication is that this is the first study to investigate the associations between communication and nursing productivity, not between communication and nursing performance [14], which is a variable used often as a similar concept of productivity in studies [9,22]. A previous study reported that the majority of medical errors involves faulty communication [28] and emotionally intelligent nurse leaders influence patient care and outcomes [29]. The continuous education program of enhancing emotional intelligence and communication skill for nurse managers as well as nurses can be a way to improve nurse productivity. Making the organizational climate influence on emotional intelligence and communication competency in a positive way can be another strategy [30]. Given these results, further studies need to be conducted to investigate the predictive powers of the variables; moreover, the various elements of the factors need to be explored because their influence on nursing productivity has yet to be elucidated.

CONCLUSION

This study provides insights into the importance of emotional intelligence and communication skills in that these variables affect nursing productivity. First, identification of emotional intelligence as well as nurses' general characteristics provides an opportunity for occupational health managers and nurse leaders to recognize how they are related to nursing productivity. In addition, considering that the productivity of individual nurses in nursing practice is dependent basically on their competency such as communication skills, these findings suggest the necessity to design nurse-centered staff development programs.

Most importantly, beyond cost-related value, reframing nursing productivity based on improvable and controllable variables in nurses along with the supporting management of organizations is strongly recommended for better quality of patient care and nurse outcomes.

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