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Mediating effect of work engagement between job characteristics and nursing performance among general hospital nurses

Original article

Eun-Kyung Lee, Sun-Hee Kim*, Jin-Hwa Park

College of Nursing, Research Institute of Nursing Science, Daegu Catholic University, Daegu 42472, South Korea

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Abstract: **Objective:** This study aimed to determine the effects of job characteristics and work engagement on the nursing performance of nurses working in general hospitals.
Methods: Data were collected from 169 nurses who are working in a general hospital in South Korea by using a cross-sectional descriptive survey design.
Results: Nurses' job characteristics and work engagement showed positive effects on nursing performance. This effect was magnified when work engagement was used as a mediating variable.
Conclusions: The findings elucidate the factors influencing job performance and provide managers with important information for developing programs to improve the job skills and work engagement of nurses.

Keywords: *general hospitals • job characteristics • nurse • work engagement • work performance*

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1. Introduction

Globally, medical institutions are striving to improve their quality of care in numerous ways amid a rapidly changing medical environment. In South Korea, the medical institution assessment system began in 1963 and changed to a system of accreditation programs in 2009.[1] Currently, some medical institutions are also working to obtain certification from the Joint Commission International (JCI – an international accreditation and certification). As nurses, who make up the largest portion of a hospital's workforce, directly impact the quality of medical services, the emphasis is being placed on nursing performance in the evaluations of these medical institutions to improve the quality of medical services.[2] Nursing performance refers to nurses achieving organizational goals by rationally performing their responsibilities and obligations.[3] In other words, nursing

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* *Corresponding author.*
E-mail: Sunhee421@cu.ac.kr (S. -H. Kim).

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performance shows how effectively a nurse in a hospital performs his/her roles and responsibilities related to patient care.[4] In particular, the nursing performance of nurses in general hospitals, where the severity of patients' conditions is higher than in other medical institutions, directly involves the effective performance of nursing interventions in terms of their obligations and responsibilities toward the patients.

Nurses' job characteristics are related to their nursing performance.[5] Job characteristics theory posits that for workers who perform specific tasks, the tasks themselves affect individual and job performance.[5] Consequently, the unique job characteristics of nurses working in general hospitals are considered to affect the nursing performance required to them. A previous study based on the job characteristics model showed that the core job characteristics of intensive care unit nurses were found to influence nursing job performance through job preference.[6] In addition, job characteristics have been reported to positively affect job performance, along with individual performance, through the mediation of the individual's psychological state.[5] That is, job characteristics increase the motivation, job quality and performance, and work satisfaction of individuals and reduce their absenteeism and turnover rates.[5]

Work engagement is defined as a positive, fulfilling work-related state of mind.[7] Studies have reported that the job characteristics of nurses affect their work engagement[8,9] and that work engagement plays a mediating role between job characteristics and turnover intention[10] and is positively associated with nursing performance.[11] Hackman and Oldham[5] identified the psychological state of the individual performing work as a mediating factor between job characteristics and work outcomes, noting that work engagement can be considered the psychological state of individual-related job performance. Therefore, since nursing performance plays an important role in achieving organizational goals, it is necessary to confirm the job characteristics and work engagement of nurses to improve their nursing performance at the organizational level.

Although previous research studied work alienation[12] and resilience[13] and developed a work performance scale[14] to explore different ways of improving nursing performance, yet there has been a paucity of research confirming the mediating effect of nurses' work engagement on the relation between the job characteristics and nursing performance of nurses working in general hospitals. Hence, we expected that nurses' work engagement would mediate between the job characteristics and nursing performance. Therefore, this study aimed to describe the nursing performance of nurses working in general hospitals and explore the effects of job characteristics and work engagement on nursing performance.

2. Methods

2.1. Design

This study adopted a cross-sectional descriptive survey design.

2.2. Participants

The participants were nurses working at hospitals in a metropolitan city and a province area in South Korea. The purpose of this study was explained to them; subsequently, they provided their consent to participate. The required minimum number of participants for the structural equation analysis of this study was 10 times the number of variables,[15] which is 120. The questionnaires were administered to 200 participants through convenience sampling and assuming that there would be some dropout rate. Only 172 participants returned the questionnaires with their response and the remaining 28 did not return the questionnaires. We used the data from only 169 participants in the analysis because questionnaires of 3 participants were excluded due to insufficient responses.

2.3. Measurements

2.3.1. Job characteristics

Job characteristics refer to key characteristics that elicit intrinsic motivation when workers perform their jobs.[5] We used items, excluding skill variety, drawn from the subcategories of the instrument developed by Sims et al.[16] based on the Job Diagnostic Survey of Hackman and Oldham[17] and translated by Lee.[18] The subcategories of the instrument included 12 items, including task identity (3 items), task significance (3 items), autonomy (3 items), and feedback (3 items). Each item was measured on a 4-point Likert scale, where 1 = *strongly disagree* and 4 = *strongly agree*; a higher score indicated higher job characteristics. Lee's study,[18] which was the first to use the Korean version of the scale, administered it to employees of companies, financial institutions, government offices, and research institutions, while Kim and Park[19] were the first to apply it to clinical nurses. However, neither study reported the validity of the scale. This scale has since been used in several studies on clinical nurses in Korea, but there is no report about its validity. In the study of Kim and

Park,[19] Cronbach's α of task identity was 0.69, task significance was 0.79, autonomy was 0.67, and feedback was 0.77. In this study, Cronbach's α for the total scale was 0.81.

2.3.2. Nursing performance

Nursing performance refers to the actual execution of work related to various activities required to provide patients with nursing care.[20] This study used a nursing performance instrument developed by Ko et al.[4] to measure this variable. The subcategories of the instrument consist of 17 items, including work competency (7 items), work attitude (4 items), willingness to improve work (3 items), and application of nursing process (3 items). Each item was scored on a 5-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*; a higher score indicated higher nursing performance. At the time of development of the scale, a study by Ko et al.[4] confirmed content validity and construct validity and reported that Cronbach's α for all items was 0.92. In this study, the value of Cronbach's α for the total scale was 0.95.

2.3.3. Work engagement

Work engagement refers to a positive and fulfilling state of mind related to work.[7] This study used the Korean version of Utrecht Work Engagement Scale (UWES)-9,[21] which is a 9-item version of the 17-item UWES,[7] which was translated into Korean and its validity and reliability tested by Kim et al.[22] The 3 subcategories consist of 9 items, including vigor (3 items), dedication (3 items), and absorption (3 items). Each item was measured on a 6-point Likert scale ranging from 0 = *never felt* to 6 = *always felt*; a higher score indicated a higher frequency of feeling work engagement. Kim et al.[22] confirmed construct validity, convergent and discriminant validity, and Cronbach's α for each subcategory; and finding values of vigor, dedication, and absorption were 0.91, 0.89, and 0.90, respectively. In this study, Cronbach's α for the total scale was 0.93.

2.4. Data collection

Data were collected from August 5 to October 20, 2017. Random sampling in proportion to hospital size was conducted under the expectation that hospital work environments would differ according to the size and grade of the hospital in the Daegu Metropolitan City and Gyeongsang Province area. The purpose, survey method, and the number of participants were explained to the directors of nursing services of the 6 selected hospitals, whose cooperation was requested. Research assistants explained the study to participants who had finished their work, had them sign the consent form, and conducted the survey.

2.5. Data analysis

The collected data were first analyzed using SPSS 25.0 (IBM Corporation, Armonk, New York, United States). Descriptive statistics were used for general and job characteristics, nursing performance, and work engagement; an internal consistency test (Cronbach's α) was used to confirm the reliability of the instruments. Correlations between the subcategories of the variables were analyzed using Pearson's correlation coefficients. IBM Statistics AMOS 22.0 (IBM Corporation, Armonk, New York, United States) was used to test the mediating effect of work engagement in the relation between job characteristics and nursing performance. The maximum likelihood method was implemented to estimate the parameters. Multivariate normal distributions were examined, and bootstrapping was used when the normality assumption was violated. The expectation–maximization method was used for missing data. The analysis was divided into 2 stages: measurement model test and structural model test using item parcels. The model fitness was determined by comprehensively considering χ^2 statistics (degrees of freedom, *P*-values), normed chi-square, standardized root mean residual, Tucker–Lewis index, comparative fit index, and root mean square error of approximation. Bootstrapping was used to test the significance of the mediating effect of work engagement in the relation between job characteristics and nursing performance.

3. Results

3.1. General characteristics

The participants' average age was 31.44 (SD = 8.33) years; 97.0% were women; 41.4% had a spouse; and 66.3% had a bachelor's degree. General-duty nurses comprised 78.7% of the sample, whereas nurses working in the internal medicine ward made up 35.0%. Their monthly pay was between 3,000 and 4,000 USD, and their total clinical experience was 9.20 (SD = 8.24) years. Their length of employment at their present hospital was 7.98 (SD = 7.43) years (Table 1).

Pearson's correlation coefficient between subcategories of work engagement, job characteristics, and nursing performance were <0.81 ($P < 0.001$), indicating that multicollinearity was nonsignificant because the correlation was not >0.85 (Table 2).

Variables	n (%)	Mean (SD)
Age (year)		31.44 (8.33)
≤29	93 (55.0)	
30–39	47 (27.8)	
≥40	29 (17.2)	
Gender		
Male	5 (3.0)	
Female	164 (97.0)	
Spouse		
Yes	70 (41.4)	
No	99 (58.6)	
Education		
Associate degree	43 (25.4)	
Bachelor's degree	112 (66.3)	
Master's degree or more	14 (8.3)	
Position		
Nurse	133 (78.7)	
Charge nurse	16 (9.5)	
Head nurse, unit manager	20 (11.8)	
Units of clinical practical		
Internal ward	57 (35.0)	
Surgical or neurology ward	56 (34.3)	
Emergency ward	8 (4.9)	
Intensive care unit	21 (12.9)	
The others	21 (12.9)	
Monthly salary (USD)		
<3,000	69 (41.1)	
≥3,000 to <4,000	80 (47.6)	
≥4,000	19 (11.3)	
Total career years		9.20 (8.24)
Career years at the current hospital		7.98 (7.43)

Table 1. General characteristics.

3.2. Mediating effect of work engagement in the relation between job characteristics and nursing performance

The results for the goodness of fit of the measurement model, tested to verify the hypothetical model, are presented in Table 3. All indices were within acceptable ranges except for $\chi 2$, which was influenced by the number of samples. Examination of differences in $\chi 2$ and degrees of freedom between the two models showed that the degree of freedom decreased by 10, but the difference in χ^2 was nonsignificant ($P < 0.121$).

The hypothetical models were tested in 3 stages. In the first stage, the exogenous variable "job characteristics" affected the endogenous variable "nursing performance" ($\beta = 0.62$, $P = 0.025$). In the second stage, job characteristics affected work engagement ($\beta = 0.48$, $P = 0.012$), and work engagement affected nursing performance ($\beta = 0.50$, $P = 0.011$). In the third stage, job characteristics affected work engagement ($\beta = 0.46$, $P = 0.009$), work engagement affected nursing performance ($\beta = 0.26$, $P = 0.039$), and job characteristics affected nursing performance ($\beta = 0.49$, $P = 0.012$) (Table 3).

The direct effects of job characteristics on work engagement (0.461), of work engagement on nursing performance (0.261), and of job characteristics on nursing performance (0.492) were all significant,

Variables	1 r	2 r	3 r	4 r	5 r	6 r	7 r	8 r	9 r	10 r	11 r
Job characteristics											
Task identity	1										
Task significance	0.37**	1									
Autonomy	0.30**	0.46**	1								
Feedback	0.13	0.35**	0.33**	1							
Nursing performance											
Work competency	0.40**	0.30**	0.27**	0.34**	1						
Work attitude	0.24*	0.37**	0.30**	0.42**	0.73**	1					
Willingness to improve work	0.30**	0.28**	0.29**	0.35**	0.69**	0.71**	1				
Application of nursing process	0.27**	0.32**	0.21*	0.33**	0.71**	0.68**	0.70**	1			
Work engagement											
Vigor	0.18*	0.29**	0.22*	0.21*	0.37**	0.39**	0.36**	0.28**	1		
Dedication	0.23*	0.29**	0.25*	0.16*	0.37**	0.36**	0.30**	0.34**	0.73**	1	
Absorption	0.22*	0.25*	0.30**	0.19*	0.43**	0.42**	0.36**	0.31**	0.70**	0.81**	1
Cronbach's α	0.62	0.83	0.81	0.56	0.92	0.85	0.84	0.86	0.84	0.80	0.88
Mean	2.86	2.52	2.74	2.92	3.08	2.81	2.97	3.78	3.41	3.19	3.65
Standard deviation	0.29	0.36	0.43	0.48	0.52	0.52	0.40	0.52	0.98	1.07	1.01

(*Continued*)

(*Continued*)

Variables	1 r	2 r	3 r	4 r	5 r	6 r	7 r	8 r	9 r	10 r	11 r
Skewness	0.08	−0.08	0.08	−0.02	−0.05	0.03	0.15	−0.16	−0.14	0.07	−0.26
Kurtosis	0.68	0.82	0.94	−0.19	−0.04	0.53	1.55	0.81	−0.09	−0.66	0.31

Note: *≤0.05; **≤0.001.
1 = task identity; 2 = task significance; 3 = autonomy; 4 = feedback; 5 = work competency; 6 = work attitude; 7 = willingness to improve work; 8 = application of nursing process; 9 = vigor; 10 = dedication; 11 = absorption.

Table 2. Descriptive statistics, Cronbach's α, and correlations for major study variables.

Steps	Endogenous variables	Exogenous variables	χ^2 (*P*)	DF	NC	SRMR	TLI	CFI	RMSEA (low-high)	β	C.R.	*P*-value
1	Nursing performance	Job characteristics	38.43 (0.005)	19	2.02	0.05	0.95	0.97	0.08 (0.04–0.11)	0.62	4.57	0.025
2	Work engagement	Job characteristics	86.18 (<0.001)	42	2.05	0.10	0.94	0.95	0.08 (0.06–0.10)	0.48	3.86	0.012
	Nursing performance	Work engagement								0.50	5.97	0.011
3	Work engagement	Job characteristics	62.73 (0.016)	41	1.53	0.05	0.97	0.98	0.06 (0.03–0.08)	0.46	3.84	0.009
	Nursing performance	Work engagement								0.26	2.88	0.039
		Job characteristics								0.49	3.85	0.012

Note: β standard estimate; CFI, comparative fit index; CR, critical ratio; DF, degree of freedom; NC, normed chi-square; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Turker–Lewis index.

Table 3. Parameter estimates according to the testing steps of the structural models.

		Effects			
Endogenous variables	Exogenous variables	Direct (*P*)	Indirect (*P*)	Total (*P*)	SMC
Work engagement	Job characteristics	0.461 (0.009)	–	0.461 (0.009)	0.213
Nursing performance	Work engagement	0.261 (0.035)	–	0.261 (0.035)	0.428
	Job characteristics	0.492 (0.015)	0.121 (0.033)	0.612 (0.026)	

Note: CR, critical ratio; SE, standard error; SMC, squared multiple correlation.

Table 4. Mediating effect of work engagement in the relationship between job characteristics and nursing performance.

as was the indirect effect (0.121) mediated by work engagement. The squared multiple correlations of work engagement and nursing performance were 213 and 428, respectively (Table 4).

4. Discussion

In this study, among the subcategories of job characteristics, task significance and autonomy scores were below average. In particular, the task significance score, which was the lowest, indicated that the participants perceived their work as unimportant. However, this contrasts with the finding of high task significance in domestic intensive care unit nurses[6] and Chinese general hospital nurses.[10,23] The reason why the task significance scores of the subjects were low can be considered as due to differences in the subjects. In this study, our participants were working in wards of general hospitals, unlike the subjects of previous studies. Second, media reports on nurses at the time of data collection seem to have affected the results. The recent compulsory mobilization of nurses to intra-hospital events, unwanted performance, burnout in nurse organizations, and increases in media reports on hospitals' high-handedness also appeared to have contributed to lowering their self-esteem as professional nurses. The finding that a positive image of nurses improves the nursing professionalism of nursing college students[24] supports this reasoning. Thus, measures to correctly promote nurses' work among the public are necessary.

According to a study that examined the nursing-related content in middle- and high-school textbooks, nursing is described as a sacrifice or community-service type of profession, and nurses are classified as a technician/semiprofessional group rather than part of the professional group that includes health and medical professionals.[25] Therefore, for nurses to be regarded as professionals by patients, they should perform nursing in a professional manner in the hospital. At the same time, the efforts of related organizations, including nurses' associations, should be coordinated to improve the distorted perception of nurses and promote the role of professional nurses. However, since this study concerned only one area of nursing, the results are not generalizable, so it will be necessary to identify the job characteristics of nurses in future studies. We noted, in particular, that autonomy scores were lower than those of other subcategories in the previous studies[6,8–10,] as well as in this study, which seems to be the result of the fact that nursing work in hospitals focuses on order performance. As autonomy affects work engagement, it is necessary to find ways to increase the autonomy of nurses in hospitals.[8]

The results of the present study showed a direct effect of nurses' job characteristics on nursing performance and an indirect effect through work engagement. This finding suggests the importance of nurses valuing their work and taking increasing responsibility for their work on their own to improve nursing performance. One study of nurses in intensive care unit in Korea found job characteristics to be related to nursing performance,[6] as with the results of this study. The findings also support job characteristics theory,[5] which states that performance increases when work is designed to ensure a high level of the subcategories of job characteristics, namely, task identity, in which workers are involved in tasks from the beginning to the end; task significance, which refers to the level of effect of one's work on people inside and outside the organization; autonomy, which means the level of decision-making authority or discretionary power allowed to an individual during work; and feedback, which involves obtaining accurate information about the results of their work activities. In the future, efforts to improve job characteristics by finding factors related to job characteristics will help to achieve a high level of nursing performance. In this study, job characteristics were positively associated with work engagement, which is similar to the findings of studies on nurses in China and Malaysia that job characteristics were associated with improved work engagement.[8,9] In the job characteristics model, an internal psychological process is required to stimulate the efficient completion of work, and this motivational process is determined by 5 subfactors that constitute job characteristics.[5] Therefore, job characteristics have a positive effect on psychological state, which results in an improvement in work engagement. In this study, work engagement was found to have a mediating effect in the relation between job characteristics and nursing performance. Job characteristics thus ultimately influenced the improvement of nursing performance because they promoted work engagement by inducing a positive psychological status of organizational members.[26] A study of Chinese nurses also reported that job characteristics constitute an influencing factor on work engagement.[10] Thus, strategies to improve work engagement need to be established because nursing performance can change depending on work engagement at the same level of job characteristics. According to a meta-analysis of the work engagement of nurses, approaches at the organizational level, such as the establishment of a system that induces autonomous work performance by assigning responsibility and authority to nurses, strengthening leadership, and ensuring fair treatment and compensation, as well as nurses' personal efforts for professional development have been reported to be factors influencing work engagement.[11] Therefore, nurses should strive for professional development on their own to improve their work engagement, whereas the nursing organization of each hospital also needs to support the professional development of nurses and creates an environment in which nurses are treated reasonably and fairly.

This study has some limitations. First, the data collection period of this study was at a time when negative problems about the treatment of nurses were publicized in social media and the mass media, so it will be necessary to recheck the results of this study through repeated studies. Second, caution is needed when generalizing the present findings to other types of hospitals, such as small- and medium-sized hospitals or geriatric hospitals, because this study involved general hospital nurses in only one city and one province area. Third, as the job characteristics scale used in this study was an instrument originally developed for general organizations but modified for nurses, the instrument might not adequately reflect the unique traits of nursing work. Fourth, we used a cross-sectional design, so it is not possible to confirm causal inferences about the relationships among variables. Nevertheless, this study presented the possibility of increasing nursing performance by improving nurses' intrinsic motivation. We also presented suggestions for intervention strategies to improve nursing performance by confirming the mediating effect of work engagement,[27] an important motivator of job performance, in the relationship between job characteristics and nursing performance.

5. Conclusions

This study confirmed that nurses' performance was strengthened through work engagement. Therefore, nursing organizations should improve nursing performance by motivating nurses to perform their work and finding methods that can measure the related outcomes. In addition, nurses' professional development should be encouraged to increase their work engagement, and efforts to create a horizontal organizational climate should be continued.

Ethical approval

This study was approved by the Institutional Bioethics Review Board of Daegu Catholic University (Approval No. CUIRB-2017-0036) before the initiation of research procedures to protect the participants. Written informed consent was obtained from all the participants.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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