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Aims and Scope

The Research in Community and Public Health Nursing (RCPHN) is the official journal of the Korean Academy of Community Health Nursing.

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RCPHN coverage includes theoretical, practical, and educational issues related to community and public health nursing. Articles include original research articles, reviews, and editorials. This journal aims to provide worldwide access to timely research and practice features of use to community health nurses, educators, school health teachers, occupational nurses, and administrators in the field of community and public health nursing.

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Factors Affecting the Performance of Infection Control of Multidrug Resistant Organisms in Intensive Care Unit Nurses of General Hospitals based on the Theory of Planned Behavior: The Mediating Effect of Intention

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Purpose: The purpose of this study is to analyze the factors that affect the performance of infection control of multidrug-resistant organisms (MDROs) by nurses in intensive care units (ICU) in general hospitals.
Methods: Participants were 105 ICU nurses from 6 general hospitals. The questions for the survey performed were based on the theory of planned behavior, such as attitude towards infection control of MDROs, subjective norms, perceived behavioral control, intention, and performance.
Results: In the relationship between subjective norms towards infection control of MDROs and performance, intention showed a significant complete mediating effect; and in the relationship between perceived behavioral control and performance, intention showed a partial mediating effect. The attitude towards infection control of MDROs was excluded from the mediating effect verification because there was no significant correlation between intention and performance.
Conclusion: The results of this study suggest that department atmosphere and perceived behavior control promotion programs should be developed to enhance subjective norms in order to promote the performance of infection control of MDROs.

Keywords: Intensive care units; Nurses; Infection control; Theory of planned behavior; Mediation analysis

Introduction

1. Background

The development of antibiotics has been used as an innovative method to treat bacterial infections, but the misuse and overuse of antibiotics have led to the emergence of multi-drug resistant organisms (MDROs) [1]. MDROs are defined as microorganisms that are resistant to one or more classes of antimicrobial agents [2], and MDRO infections are reported to increase the economic burden due to prolonged hospital stay and the incurrence of additional medical costs, and show high morbidity and mortality rates [3,4]. Various intervention strategies for infection control of MDROs can decrease medical costs of individual patients, and reduce the increase of national healthcare expenditure at a national level [3]. Therefore, in the U.S., the Centers for Disease Control and Prevention (CDC) has been implementing systematic infection control against MDROs through standardized, evidence-based clinical practice guidelines, including accurate diagnosis and treatment, a judicious use of antibiotics, and compliance with standard precautions and contact precautions to prevent the transmission of MDRO infections [2]. In Korea, a sentinel surveillance system for healthcare-associated infectious diseases has been established and operated for 6 types of MDROs [5]. Also, Methicillin-resistant Staphylococcus aureus (MRSA), Vancomy-

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cin-resistant Enterococci (VRE), multi-drug resistant Acinetobacter baumannii (MRAB), and multi-drug resistant Pseudomonas aeruginosa (MRPA) have been designated as Group 4 infectious diseases, and a sentinel surveillance system for them has been implemented [5]. These policy changes regarding infection control reflect the increasing seriousness of MDORs in healthcare settings [6]. MDORs can be spread within medical institutions mainly through direct and indirect contact with patients or medical devices, and in particular, there is an increasing risk of infection through invasive medical devices [7]. Especially, patients in intensive care units (ICUs) have difficulty maintaining skin integrity due to the application of invasive medical devices such as peripheral and central venous catheters, and they are at increased risk for infection because the use of immunosuppressants and underlying diseases such as diabetes can compromise host defense mechanisms against infection [8]. In a study on the comparison between antibiotic resistance rates of isolated strains from ICU patients and non-ICU patients, the antibiotic resistance rates of MRSA strains from ICU patients and non-ICU patients were 84% and 58%, respectively, and the antibiotic resistance rates of VRE strains from ICU patients and non-ICU patients were 34% and 19%, respectively, revealing that isolates from ICU patients showed higher antibiotic resistance rates [9]

MDRO infections may be transmitted to other patients through medical personnel who have frequent contact with patients [2], and among medical staff members of medical institutions, nurses have many opportunities to come into contact with patients since they provide patients with various non-invasive or invasive nursing activities, so nurses have a very important role in the implementation of infection control in healthcare settings [10]. In studies on the actual status of infection control of MDROs, a larger size of medical institutions and greater availability of manpower and other resources for infection control were found to be associated with a stricter implementation of infection control against MDROs [11]. In addition, general hospitals were shown to have a lack of resources for infection control in overall areas, including manpower, a system, and facilities for infection control [12]. In addition, the percentage of hospitals with the ICU equipped with isolation rooms for isolation treatment of patients infected with MDROs was found to be 100% for tertiary hospitals and 86.6% for general hospitals [13]. As described above, since general hospitals are more likely to experience a lack of resource support for infection control against MDROs compared to tertiary general hospitals, ICU nurses of general hospitals are expected to have greater difficulty in carrying out infection control against MDROs than ICU nurses of tertiary general hospitals.

Regarding previous studies on infection control against MDROs among ICU nurses in Korea, prior studies on infection control among ICU nurses of tertiary general hospitals examined perception of infection control [14] or investigated the knowledge and practice of inflection control [15-17]. Meanwhile, in prior studies on infection control among ICU nurses of general hospitals, the knowledge and practice of inflection control [18] and infection control against VRE [19] were investigated. In these studies, the method of infection control education, satisfaction with infection control education, perception of empowerment and environmental safety [18], age, education level, and isolation environment [15] were identified as factors affecting the performance of infection control against MDROs among ICU nurses, and research was mostly focused on analysis of relationships between variables or the investigation of influencing factors. As described above, since a number of previous studies in Korea were conducted without applying a conceptual framework or a theory,

they had limitations in systematically investigating factors affecting the practice of infection control of MDROs and relative effects of influencing factors. Therefore, this study intends to apply the theory of planned behavior (TPB) proposed by Ajzen [20], since the TPB is generally regarded as an excellent theory for predicting the behaviors of individuals. According to the TPB, since intention is a motivation factor for performing a behavior, stronger intention is associated with a higher likelihood of performing the behavior, and intention is influenced by three variables: attitude toward the behavior, subjective norm, and perceived behavioral control. In other words, the TPB claims that 'attitude' toward the behavior, 'subjective norm', which is related to other people's opinions or perceptions, and 'perceived behavior control', which is related to one's perception of factors hindering the behavior, influence a particular behavior through intention acting as a mediating variable [20].

With respect to previous studies on infection control applying the TPB, a prior research reported that attitude, subjective norm, and perceived behavioral control were found to be predictors for behavioral intention, and that perceived behavioral control was identified as a direct predictor for performance [22]. In addition, some previous studies found that perceived behavioral control, subjective norm, and intention had a direct effect on performance, while attitude was not an influencing factor for performance [17,23]. Meanwhile, some research found that intention had a direct effect on performance, but perceived behavioral control did not have any effect on it [21]. As described above, the findings of previous studies applying the TPB are partially inconsistent in terms of the explanatory power of measured variables and rela-

tionships between variables, depending on study participants and the type of behavior studied. However, the results of prior studies applying the TPB suggest that intention is a strong influencing factor for behavior. Therefore, noting the importance of the role of ICU nurses in the implementation of infection control to prevent MDRO infections in patients in the ICU, in order to improve the performance of infection control against MDROs in ICU nurses, this study aimed to identify factors affecting the performance of infection control against MDROs based on the TPB through the verification of the mediating effect of intention among major variables of the TPB. Through this investigation, the present study purported to provide basic data for the development of intervention strategies to enhance the performance of infection control against MDROs among ICU nurses of general hospitals.

2. Objectives

Based on the theory of planned behavior (TPB), this study aimed to identify factors influencing the performance of infection control against MDROs in ICU nurses of general hospitals through the verification of the mediating effect of intention, an antecedent factor of behavior, among major variables of the TPB. The specific objectives of this study are as follows:

1) To examine differences in attitude, subjective norm, perceived behavioral control, intention, and performance regarding infection control of MDROs according to the characteristics of participants:
   a. To examine attitude, subjective norms, perceived behavioral control, intention, and performance regarding infection control of MDROs;
   b. To investigate correlations between attitude, subjective norm, and perceived behavioral control, intention, and performance regarding infection control of MDROs;
2) To investigate the mediating effect of intention in the relationships between attitude, subjective norm, perceived behavioral control, and performance regarding infection control of MDROs.

Methods

1. Study design

This study is a descriptive survey research based on the theory of planned behavior, and this research aimed to identify factors affecting the performance of infection control of MDROs among ICU nurses of general hospitals, and investigate the mediating effect of intention, an antecedent variable of behavior, among major variables from the theory of planned behavior.

2. Participants

The participants of this study were nurses working in intensive care units (ICUs) of 6 general hospitals located in J Province, and they were selected by convenience sampling. The sample size was calculated using the G-power 3.1 program. The effect size was determined using an explanatory power of 23.4%, based on a previous study by Gu et al. [17], which reported that the explanatory power of factors influencing the performance of MDRO infection control guidelines was 23.4%. The minimum sample size for multiple regress analysis was determined to be 96 persons with a significance level of . 05, a power of 0.80, and 19 predictor variables. The 19 predictor variables included 14 general characteristics as well as variables from the theory of planned behavior, such as attitude, subjective norms, perceived behavioral control, and intention. Taking into account the dropout rate of 10% and the return rate of questionnaires, questionnaires were distributed to 110 persons, and a total of 110 copies were collected. Among them, a total of 105 copies were finally used in data analysis, excluding 5 respondents due to insincere responses. Regarding the inclusion criteria, participants were selected among nurses with at least 3 months of experience in working as an ICU nurse, and only persons who understood the purpose of the study, and provided written informed consent to participate were included in this study. Nursing managers of ICUs who did not directly participate in the care of ICU patients and newly employed nurses were excluded from this study.

3. Measures

1) Attitude toward infection control of MDROs

Attitude toward infection control of MDROs was measured using the assessment tool presented by Gu et al. [17] after obtaining approval for its use from the authors. Gu et al. [17] created an assessment tool for attitude toward performance of MDRO infection control guidelines by modifying an instrument developed by Moon & Song [23]. The original instrument proposed by Moon & Song [23] was intended to assess attitude toward the performance of healthcare-associated infection control guidelines. The scale for attitude toward infection control of MDROs used in this study is composed of 5 items. Each item was rated on a 7-point Likert scale ranging from 1 point (Strongly disagree) to 7 points (Strongly agree). Higher scores indicate more positive attitude toward the performance of MDRO infection control guidelines. Regarding the reliability of the scale, the value of Cronbach α was .75 in the study by Gu et al. [17], and it was .80 in this study.

2) Subjective norm about infection control of MDROs

Subjective norm about infection control of MDROs was assessed using the assessment tool proposed by Gu et al. [17] after obtaining approval for its use. Gu et al. [17] devised a measurement tool for subjective norm about performance of MDRO infection control guidelines by modifying a tool developed by Moon & Song [23]. The original scale created by Moon & Song [23] is an instrument designed to measure subjective norm about the performance of healthcare-associated infection control guidelines. The assessment tool used in this study consists of 2 items. Each item was rated on a 7-point Likert scale ranging from 1 point (Strongly disagree) to 7 points (Strongly agree). Higher scores indicate higher pressure from people around the individual about the performance of infection control against MDROs. Regarding the reliability for the assessment scale, the value of Cronbach α was .78 in Gu et al. [17] and it was .66 in this study.

3) Perceived behavioral control about infection control of MDROs

Perceived behavioral control about infection control of MDROs was measured with the tool presented by Gu et al. [17] after receiving approval for its use. Gu et al. [17] created an assessment tool for perceived behavioral control about the performance of MDRO infection control guidelines by revising a tool developed by Moon & Song [23], which was an assessment tool for perceived behavioral control about the performance of healthcare-associated infection control guidelines. The assessment tool for perceived behavioral control used in this study is composed of 5 negative questions. Each item was rated on a 7-point Likert scale ranging from 1 point (Strongly disagree) to 7 points (Strongly agree). All items were reverse scored, and higher scores indicate higher levels of the ability to control factors that impede the performance of infection control of MDROs. As to the reliability of the tool, the value of Cronbach α was .74, and it was .76 in the present study.

4) Intention of infection control of MDROs

Intention for infection control of MDROs was assessed using a tool presented by Gu et al. [17] after obtaining approval for its use. Gu et al. [17] created an assessment instrument for intention about the performance of MDRO infection control guidelines by revising a tool developed by Moon & Song [23]. The original scale developed by Moon & Song was an instrument designed to assess subjective norm about the performance of healthcare-associated infection control guidelines [23]. The assessment tool for intention of infection control of MDROs is composed of 3 items. Each item was rated on a 7-point Likert scale ranging from 1 point (Strongly disagree) to 7 points (Strongly agree). Higher scores indicate stronger intention to perform MDRO infection control guidelines. Regarding the reliability for the assessment tool, the value of Cronbach α was .77 in Gu et al. [17], and it was .84 in this study.

5) Performance of infection control of MDROs

The performance of infection control of MDROs was measured using a tool presented by Gu et al. [17] after obtaining approval for its use from the authors. Gu et al. [17] created an assessment tool for the performance of MDRO infection control guidelines by revising a tool developed by Shon & Park [15]. The original tool developed by Shon & Park [15] was an assessment scale for infection control performance of ICU nurses.

The assessment scale for MDRO infection control performance used in this study is composed of a total of 22 items, which include questions about general infection control measures, such as sharing information about precautions, hand washing, wearing protective equipment, instrument management, and environment management, as well as questions about guidelines specific to each of the 6 types of MDROs. Respondents were asked to indicate their self-rated level of performance for each item. Each item was rated on a 5-point Likert scale ranging from 1 point (Hardly) to 5 points (Always). Higher total scores indicate higher levels of infection control performance of MDROs. Regarding the reliability for the assessment tool, the value of Cronbach α was .92 in both Gu et al. [17] and this study.

4. Data collection

The participants of this study were nurses working in the ICUs of six general hospitals located in J Province. The researcher personally visited the ICUs of the six general hospitals over a period from November 15 to December 7, 2019, and obtained consent to participate from each hospital after explaining the purpose and methods of the study to the hospital director and nursing manager of each hospital. After explaining the purpose and procedures of the study to participants, a self-administered questionnaire survey was conducted only with persons who voluntarily agreed to participate and signed written informed consent. The completed questionnaires were collected by personal visit or by mail when it was difficult to collect questionnaires by personal visit.

5. Ethical Considerations

To protect the rights of participants, this study was conducted after obtaining approval from the Institutional Review Board (IRB) of Mokpo National University after IRB review (Approval No.: MNUIRB-20190902-SB-006-01). Participants were given

explanations about the purpose and methods of the study, and they were informed about their right to withdraw from this study at any time without any consequences if they wanted to. They were also informed that collected data would not be used for purposes other than research, and that all research data and records would be destroyed after storing them for 3 years from the date of study completion.

6. Statistical analysis

The collected data was analyzed using SPSS/WIN 25.0, and specific analysis methods were as follows.

Differences in the levels of attitude, subjective norm, perceived behavioral control, intention and performance regarding infection control of MDROs according to the characteristics of participants were examined using the t-test and one-way ANOVA. The levels of attitude, subjective norm, perceived behavioral control, intention and performance regarding infection control of MDROs were analyzed by calculating frequencies, percentages, means, and standard deviations. Also, Pearson's correlation coefficient was used to examine relationships between attitude, subjective norm, perceived behavioral control, intention, and performance regarding infection control of MDROs.

In addition, the three-step mediated regression analysis proposed by Baron & Kenny [24] was used to examine the mediating effect of intention in the relationship of the performance of infection control of MDROs with attitude, subjective norm, and perceived behavioral control regarding infection control of MDROs. In the Baron and Kenny method of mediation analysis [24], the first step is regression analysis for the effect of independent variable on the mediating variable, the second step is regression analysis for the effect of the independent variable on the dependent variable, and the third step is regression analysis for the effects of the independent and mediating variables on the dependent variable. In the third step, both the independent and mediating variables are simultaneously entered into the regression model to conduct regression analysis after controlling for the effects of the variables on each other. To demonstrate that a variable has a significant mediation effect, it needs to be shown that the mediating variable has a significant effect in the first and second regression analyses, and additionally, the effect size for the effect of the independent variable on the dependent variable needs to be reduced in the third regression analysis compared to the effect size in the second regression analysis. At this time, if there is still a significant relationship between the independent and dependent variables, the mediating variable is considered to have a partial mediation effect, and if not, the mediating variable is considered to have a full mediation effect. The mediation test for the significance of the mediation effect was performed using the Sobel mediation formula (Z) [25].

Results

1. Differences in attitude, subjective norm, perceived behavioral control, intention, and performance regarding infection control against MDROs according to the characteristics of participants

The participants consisted of 86 females (81.9%) and 19 males (18.1%). In age, the 25-29 age group made up the largest proportion of participants at 45.7% (48 persons). As for education level, nurses with a bachelor's or higher degree were 81 persons (77.1%), taking the largest proportion of participants, and nurses with an associate degree from three-year colleges made up 22.9% (24 persons). As to the length of clinical career, nurses with 1 to less than 5 years of clinical career made up the largest proportion of participants at 41% (43 persons). For the length of current position career, nurses with 1 to less than 3 years of career as an ICU nurse took the largest proportion of participants at 30.5% (32 persons). Regarding education on infection control against MDROs, 89 persons (84.8%) had the experience of receiving education on infection control against MDROs. In addition, both the rate of nurses with the experience of caring for patients with MDRO infections and the rate of hospitals with MDRO infection control guidelines were 100%. Regarding the level of satisfaction with MDRO infection control guidelines, 92 persons (87.6%) reported that they were satisfied with the guidelines. As a result of the analysis of differences in attitude, subjective norm, perceived behavioral control, intention, and performance regarding infection control against MDROs according to general characteristics of participants, it was found that there were no significant differences ($p > .05$) (Table 1).

2. The levels of attitude, subjective norm, perceived behavioral control, intention, and performance regarding infection control of MDROs

The mean scores for attitude, subjective norm, perceived behavioral control, intention, and performance regarding MDROs infection control were 5.97(±1.07) points, 6.51(±0.62) points, 5.61(±0.97) points, 5.74(±0.98) points, and 4.44(±0.46) points, respectively (Table 2).

Table 1. Differences in Attitude toward Multidrug-resistant organisms (MDROs) infection control, Subjective norms, Perceived behavior control, Intention and Performance by Characteristics (*N*=105)

Characteristics	Categories	n(%)	Attitude		Subjective norms		Perceived behavior control		Intention		Performance	
			M±SD	t or F (*p*)	M±SD	t or F (*p*)	M±SD	t or F (*p*)	M±SD	t or F (*p*)	M±SD	t or F (*p*)
Gender	Male	19(18.1)	6.13±0.88	0.70	6.55±0.66	0.33	5.36±1.33	-0.96	5.51±1.32	-0.89	4.30±0.50	-1.46
	Female	86(81.9)	5.94±1.10	(.487)	6.50±0.61	(.740)	5.67±0.87	(.347)	5.79±0.89	(.385)	4.47±0.45	(.147)
Age(year)	22-24	24(22.9)	6.09±0.95	0.27	6.44±0.45	1.31	5.61±0.91	3.10	5.89±0.90	1.90	4.33±0.48	1.38
	25-29	48(45.7)	5.87±1.17	(.846)	6.43±0.77	(.276)	5.50±1.01	(.030)	5.54±1.08	(.134)	4.43±0.48	(.253)
	30-34	15(14.3)	6.03±1.25		6.63±0.44		6.27±0.67		6.18±0.59		4.63±0.38	
	≥35	18(17.1)	6.03±0.80		6.72±0.43		5.34±0.98		5.70±0.96		4.47±0.42	
Education level	College	24(22.9)	5.98±1.35	0.06	6.42±0.76	-0.83	5.61±1.09	-0.01	5.88±1.14	0.77	4.46±0.48	0.20
	Bachelor	81(77.1)	5.97±0.98	(.951)	6.54±0.57	(.406)	5.61±0.94	(.995)	5.70±0.93	(.443)	4.44±0.46	(.839)
Clinical career(year)	<1	27(25.7)	6.23±0.78	1.09	6.56±0.45	1.30	5.73±0.96	0.61	5.94±1.03	1.05	4.34±0.50	1.25
	1≤y<5	43(41.0)	5.82±1.11	(.356)	6.37±0.79	(.277)	5.46±1.01	(.612)	5.55±1.00	(.376)	4.52±0.40	(.297)
	5≤y<10	21(20.0)	5.83±1.48		6.64±0.45		5.72±0.95		5.76±0.99		4.37±0.54	
	≥10	14(13.3)	6.16±0.53		6.64±0.50		5.69±0.94		5.90±0.76		4.52±0.41	
Current position career(year)	<1	31(29.5)	6.15±0.93	0.55	6.53±0.45	2.88	5.75±0.96	0.91	5.88±0.99	0.57	4.34±0.49	1.03
	1≤y<3	32(30.5)	5.86±1.08	(.653)	6.27±0.86	(.040)	5.41±1.02	(.437)	5.59±1.04	(.638)	4.55±0.42	(.384)
	3≤y<5	14(13.3)	5.80±1.04		6.71±0.38		5.50±0.90		5.62±0.88		4.43±0.41	
	≥5	28(26.7)	5.99±1.22		6.66±0.47		5.74±0.97		5.81±0.96		4.44±0.50	
Position	Staff nurse	91(86.7)	5.94±1.13	-0.33	6.49±0.64	-0.05	5.60±0.98	-0.22	5.71±1.01	0.02	4.43±0.47	-0.52
	Charge nurse	14(13.3)	6.08±0.58	(.744)	6.50±0.53	(.962)	5.68±1.02	(.287)	5.71±0.52	(.987)	4.50±0.39	(.605)
Experience of MDROs infection control education	Yes	89(84.8)	5.93±1.10	-1.03	6.52±0.63	0.28	5.58±1.00	-0.74	5.76±0.97	0.51	4.45±0.46	0.59
	No	16(15.2)	6.23±0.84	(.304)	6.47±0.59	(.777)	5.78±0.81	(.462)	5.63±1.04	(.613)	4.38±0.47	(.559)
Satisfied with the application of MDROs infection control guidelines	Satisfied	92(87.6)	5.95±1.12	-0.44	6.49±0.64	-0.90	5.66±0.97	1.39	5.79±1.01	1.51	4.47±0.46	1.67
	Unsatisfied	13(12.4)	6.09±0.58	(.665)	6.65±0.47	(.373)	5.26±0.94	(.169)	5.36±0.58	(.135)	4.24±0.48	(.098)

MDROs=Multidrug-resistant organisms; VRSA=Vancomycin–resistant Staphylococcus aureus; MRSA=Methicillin–resistant Staphylococcus aureus; VRE=Vancomycin–resistant Enterococci; CRE=Carbapenem–resistant Enterobacteriaceae; MRPA=Multidrug- resistant Pseudomonas aeruginosa; MRAB=Multidrug- resistant Acinetobacter baumannii

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3. Correlations between attitude, subjective norm, perceived behavioral control, intention, and performance regarding infection control of MDROs

Infection control performance of MDROs showed a significant positive correlation with subjective norm (r=.24, p=.012), perceived behavioral control (r=.53, p<.001), and intention (r=.54, p<.001). Attitude toward infection control of MDROs was significantly positively correlated with subjective norm (r=.20, p=.038). Also, subjective norm about infection control of MDROs showed a significant positive correlation with perceived behavioral control (r=.35, p<.001), intention (r=.38, p<.001), and performance (r=.24, p=.012). In addition, perceived behavioral control about infection control of MDROs was found to have a significant positive correlation with intention (r=.67, p<.001) and performance (r=.53, p<.001). Furthermore, intention for infection control of MDROs had a positive correlation with infection control performance of MDROs (r=.54, p<.001) (Table 3).

4. The mediating effect of intention of infection control against MDROs

To verify the mediating effect of intention for infection control of MDROs, a three-step mediation test was performed by the mediated regression analysis method proposed by Baron & Kenny (1986), and the results are shown in Table 4. Before performing regression analysis to verify the mediating effect, tests for multicollinearity, residuals, and outliers were performed to check assumptions for regression analysis. As a result, a correlation coefficient between independent variables of < .80, a tolerance of ≥0.55, a variance inflation factor (VIF) of ≤1.82, and a Durbin-Watson value of 1.69-1.93 were obtained, indicating that there was no multicollinearity or autocorrelation. In addition, to check the normality and homoscedasticity of the error term, the normal P-P plot and the scatter diagram were examined. As a result, all the variables were found to be normally distributed, and satisfaction of the homoscedasticity of individual residuals was also confirmed. Thus, regression analysis was carried out. Since there were no significant differences in variables related to infection control of MDROs according to general characteristics of participants (p >.05), the characteristics of participants were not included in regression analysis. In addition, since attitude toward infection control of MDROs was found to have no significant correlation with intention and performance (p >.05), it was also excluded from mediation analysis.

1) The mediating effect of intention in the relationship between subjective norm and performance

To test the mediating effect of intention, regression analysis was performed by the method proposed by Baron & Kenny [24]. In the first step, subjective norm used as the independent variable was found to have a significant effect on intention, the mediating variable (β=.38, p<.001). In the second step, subjective norm used as the independent variable was found to have a significant effect on performance, the dependent variable (β=.24, p=.012). In the final third step, infection control performance of MDROs was entered as the dependent variable, and subjective norm as the

Table 2. Attitude toward Multidrug-resistant organisms(MDROs) infection control, Subjective norms, Perceived behavior control, Intention and Performance (N=105)

Variables	Mean±SD	Min-Max	Possible range
Attitude	5.97±1.07	1.00-7.00	1-7
Subjective norm	6.51±0.62	3.50-7.00	1-7
Perceived behavior control	5.61±0.97	3.20-7.00	1-7
Intention	5.74±0.98	3.00-7.00	1-7
Behavior	4.44±0.46	3.00-5.00	1-5

Table 3. Correlation between the Variables (N=105)

	Attitude	Subjective norm	Perceived behavior control	Intention	Behavior
	r (p)	r (p)	r (p)	r (p)	r (p)
Attitude	1				
Subjective norm	.20 (.038)	1			
Perceived behavior control	.16 (.115)	.35 (<.001)	1		
Intention	.11 (.274)	.38 (<.001)	.67 (<.001)	1	
Behavior	-.00 (.983)	.24 (.012)	.53 (<.001)	.54 (<.001)	1

Table 4. Mediating Effect of Intention (N=105)

Models		B	SE	β	t	*p*	R^2	AdjR^2	F	*p*
Step 1	Subjective norm → Intention	0.61	0.14	.38	4.23	< .001	.15	.14	17.87	< .001
Step 2	Subjective norm → Behavior	0.18	0.07	.24	2.55	.012	.06	.05	6.5	0.012
Step 3	Subjective norm → Behavior	0.03	0.07	.04	0.47	.637	.29	.28	21.03	< .001
	Intention → Behavior	0.25	0.04	.52	5.79	< .001				
					Sobel test: z = 3.57, *p* < .001					
Step 1	Perceived behavior control → Intention	0.68	0.07	.67	9.21	< .001	.45	.45	84.73	< .001
Step 2	Perceived behavior control → Behavior	0.25	0.04	.53	6.32	< .001	.28	.27	39.88	< .001
Step 3	Perceived behavior control → Behavior	0.14	0.05	.30	2.79	.006	.34	.33	26.37	< .001
	Intention → Behavior	0.16	0.05	.34	3.09	.003				
					Sobel test: z = 3.04, *p* < .001					

independent variable and intention as the mediating variable were simultaneously entered into the regression model to conduct regression analysis after controlling for the effects of the variables on each other. As a result, it was found that intention had a significant effect on performance (β = .52, *p* < .001), but subjective norm did not have a significant effect on performance (β = .04, p = .637), indicating that intention showed a full mediation effect in the relationship between subjective norm and performance (Figure 1A). Additionally, the Sobel test was performed to test the significance of the mediating effect of intention for infection control of MDROs, and the results indicated that intention had a significant mediating effect in the relationship between subjective norm and performance (Z = 3.57, *p* < .001) (Table 4).

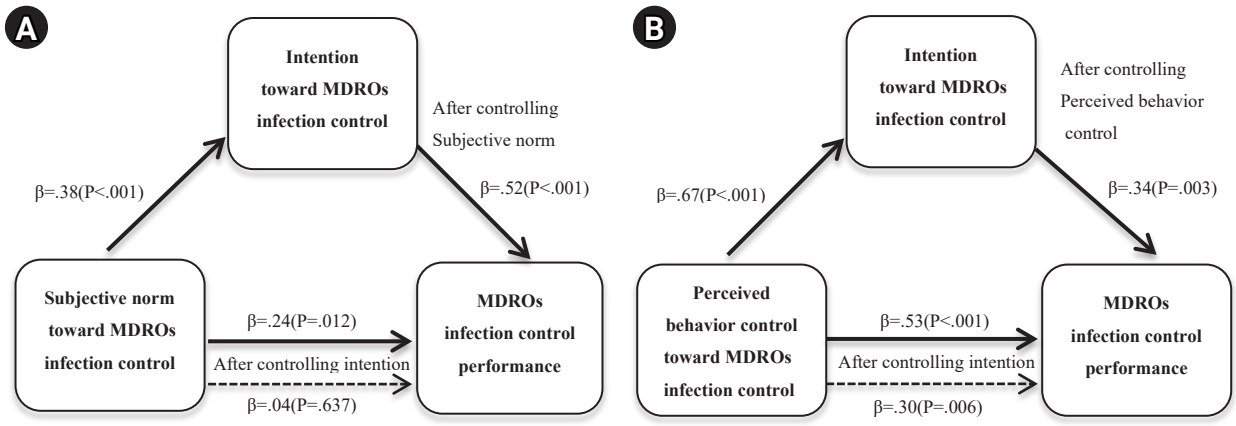
2) The mediating effect of intention in the relationship between perceived behavioral control and performance

As a result of mediation analysis by the Baron and Kenny method [24], in the first step, perceived behavioral control used as the independent variable was found to have a significant effect on intention, the mediating variable (β = .67, *p* < .001). In the second step, perceived behavioral control used as the independent variable was found to have a significant effect on performance, the dependent variable (β = .53, *p* < .001). In the final third step, after MDRO infection control performance was entered as the dependent variable, perceived behavioral control as the independent variable and intention as the mediating variable were simultaneously entered into the regression model to conduct regression analysis after controlling for the effects of the variables on each other. As a result, both perceived behavioral control (β = .30, *p* = .006) and intention (β = .34, *p* = .003) were found to have a significant effect on intention. In other words, when intention was entered as a mediating variable, perceived behavioral control was shown to have a significant effect on performance, but the regression coefficient, which indicates the effect of the independent variable on the dependent variable, was decreased in the third step (β = .30), compared to the regression coefficient in the second step (β = .53), indicating that intention played a partial mediator role in the relationship between perceived behavioral control and performance (Figure 1B). Additionally, the Sobel test was conducted to determine the statistical significance of the mediating effect of intention about infection control of MDROs, and the results confirmed that the mediation effect of intention in the relationship between perceived behavioral control and performance was statistically significant (Z = 3.04, *p* < .001) (Table 4).

Discussion

This study attempted to investigate factors affecting infection control performance of MDROs among ICU nurses in general hospitals, based on the theory of planned behavior (TPB), and verify the mediating effect of intention among major variables of the TPB, considering that intention is an antecedent factor of behavior.

In this study, the levels of attitude (mean: 5.97 points), subjective norm (mean: 6.51 points), intention (mean: 5.74 points), and performance (mean: 4.44 points) regarding infection control of MDROs were similar to the results of a previous study of ICU nurses of tertiary general hospitals by Gu et al. [17] as well as the results of a prior study of nurses working in general wards by Moon & Song [23]. However, the mean score for perceived behavioral control (5.61 points) in this study is similar to 5.4 points reported by Gu et al. [17], but it was higher than 5.0 points reported by Moon & Song [23]. In this regard, considering that perceived behavioral control refers to the degree of ease and difficulty



*MDROs=Multidrug-resistant organisms; VRSA=Vancomycin–resistant *Staphylococcus aureus*; MRSA=Methicillin–resistant *Staphylococcus aureus*; VRE=Vancomycin–resistant *Enterococci*; MRPA=Multidrug-resistant *Pseudomonas aeruginosa*; CRE=Carbapenem–resistant *Enterobacteriaceae* ; MRAB=Multidrug –resistant *Acinetobacter baumannii*

Figure 1. Mediating effect of intention. (A) Mediating effect of intention on MDROs infection control in relationship between subjective norms of MDROs infection control and the MDROs infection control performance (B) Mediating effect of intention on MDROs infection control in relationship between perceived behavior of MDROs infection control and the MDROs infection control performance.

perceived by the individual in performing a particular behavior [20], the above-described difference or similarity in research results about perceived behavioral control is presumed to reflect the fact that ICU nurse with more experience in infection control of MDROs perceive that they are able to manage infection control, compared to general ward nurses. Although it was expected that there would be differences in infection control performance of MDROs in ICU nurses between general hospitals and tertiary hospitals as a result of differences in characteristics of general hospitals and tertiary hospitals, such as the characteristics and composition of medical personnel and hospital systems, the results of this study were similar to the findings of a previous study among ICU nurses in tertiary general hospitals [17]. In this connection, in Korea, the outbreak of Middle East respiratory syndrome (MERS) in hospitals and local communities in 2015 [26] increased social interest in infection control and raised questions about it, which led to the amendment of medical law related to infection control in October, 2016 [27]. As a result, the MERS outbreak and the consequential revision of medical law have brought about several changes in infection control policies, such as the introduction of infection control fees, establishment of standards of staffing and deployment of infection control manpower, and reinforcement of standards of infection control manpower by hospital size. A relatively higher score for perceived behavioral control in this study is presumed to reflect such infection control measures.

Before examining the mediation effect of intention for infection control of MDROs, correlation analysis between variables was conducted. As a result, subjective norm, perceived behavioral control, and intention about infection control of MDROs were found to have a significant positive correlation with infection control performance of MDROs. In this regard, similar findings have been reported by a previous study on hand hygiene compliance in hospital nurses [21] and a prior study on the performance of MDRO infection control guidelines among ICU nurses [17]. As for attitude toward infection control of MDROs, although it was found to have a significant positive correlation with subjective norm, it did not show any correlations with infection control performance of MDROs. These results about attitude are similar to the findings of some previous studies. For example, a prior study reported that there was no significant relationship between attitude and performance regarding infection control of MDROs [17], and a previous study showed that there was no significant relationship between attitude toward hand hygiene and hand hygiene compliance [28]. However, some research reported that attitude toward hand hygiene was significantly positively correlated with the intention and compliance rate of hand hygiene [21]. These inconsistent study findings about attitude warrant replication research to elucidate the effect of attitude on performance.

In this study, intention was found to have a full mediating effect in the relationship between subjective norm and performance re-

garding infection control of MDROs, and these results suggest that infection control performance can be improved through intention. Although there have been few similar studies to investigate the mediation effects of intention, the results of this study are consistent with the findings of some previous studies on intention of hand hygiene compliance. In particular, a study on intention of hand hygiene compliance reported that subject norm is an influencing factor for compliance intention [28], and another previous study found that intention of hand hygiene compliance has a direct effect on compliance behavior [21]. Subjective norm refers to the degree to which the individual perceives social pressure that requires him or her to perform infection control. Therefore, as a strategy to enhance subjective norms, it is recommended to create the atmosphere of the department through the leadership of superiors and positive feedback from colleagues. In this connection, a previous research about hand hygiene [29] studied the effectiveness of the implementation of protocol for hand hygiene. According to this previous study, the members of the infection control committee and department heads performed the role of a support group, and carried out activities such as hand hygiene education, promotion activities. Additionally, the study described that efforts to spread hand hygiene culture were made by methods such as vision presentation through leadership, promotional activities employing posters and screensavers, and education for all hospital personnel on how to properly wash hands. Regarding the effectiveness of the implementation of hand hygiene protocol, the study reported that it resulted in an increase in the hand hygiene compliance rate of overall hospital personnel and a year-on-year reduction in the incidence rate of MRSA bacteremia and the VRE detection rate during a study period [29].

According to Ajzen [20], intention is influenced by the three variables of attitude toward behavior, subjective norm, and perceived behavioral control, and stronger intention is associated with the higher likelihood of performing a particular behavior. In this study, intention was shown to have a full mediating effect in the relationship between subjective norm and performance regarding infection control of MDROs, and these results suggest that the enhancement of subjective norm and intention will lead to the improvement of infection control performance. Thus, in terms of strategies to improve infection control performance in ICU nurses, when the compliance rate of contact precautions, the hand hygiene performance rate, and the isolation rates of MDROs are monitored in an attempt to promote and improve infection control of MDROs, it is necessary to share monitoring data with ICU staff and provide them with continuous feedback, education on infection control of MDROs, and activities to raise awareness about the importance of infection control of MDROs. It is thought that these activities will help ICR nurses to internalize subjective norms about infection control of MDROs, influence behavioral intention, thereby leading ICR nurses to give priority to infection control of MDROs at any time in any place, and help them to practice infection control behavior for MDROs.

In the relationship between perceived behavioral control and performance regarding infection control of MDROs, intention was found to have a partial meditating effect, and these results indicate that perceived behavioral control is a factor directly influencing performance. These findings are consistent with previous structural model studies on infection control performance of MDROs [17,23], which reported that perceived behavioral control had a direct effect on infection control performance, and it also had a partial mediating effect through intention. Perceived behavioral control refers to a high level of confidence in one's ability to control factors as needed for performing infection control through perceiving the ease and difficulty of performing infection control against MDROs [20]. In other words, perceived behavioral control can be improved by providing support for resources needed for infection control against MDROs and removing factors hindering infection control. In a previous study, the greatest difficulty in properly performing infection control of MDROs in ICUs was found to be a lack of time [18], and these study results suggest that because ICU nurses take care of patients with high disease severity, they generally have to manage heavy workload and thus do not have a sufficient time to perform their duties while complying with MDRO infection control guidelines. The results of the 2017 (2nd) Appropriateness Evaluation of ICUs showed that the mean nurse-to-bed ratio for ICU nurses was lower in general hospitals than in tertiary general hospitals [13], and these results suggest that there is a need to consider methods for ensuring adequate nurse staffing levels in order to improve the performance of infection control against MDROs. In addition, a study on the performance of infection control against MDROs in ICU nurses of general hospitals [18] found that the level of performance was lower in isolation areas, and this lower level of performance in isolation areas was related to the fact that hospitals participating in the research failed to secure adequate space for isolation in the ICU. Actually, according to the results of the Appropriateness Evaluation of ICUs, the percentage of hospitals with the ICU equipped with isolation rooms was found to be lower in general hospitals than in tertiary general hospitals [13], and these results suggest that strict isolation of patients with MDRO infections requires appropriate administrative support. Therefore, in order to increase perceived behavioral control regarding infection

control against MDROs among ICU nurses of general hospitals, it is necessary to find feasible, practical strategies to improve hindrance factors such as a lack of time, heavy workload, and a shortage of physical and human resources in relation to factors hindering infection control against MDROs that may occur in the work environment of ICUs.

In this study, since attitude toward infection control against MDROs did not have a significant correlation with intention or performance, attitude was excluded from mediation analysis. Consistent with the results of the present study, previous studies of infection control performance among nurses [17,23] reported that attitude did not influence infection control performance. In this regard, considering that attitude refers to the level of positive or negative evaluation on MDRO infection control behavior but the performance of infection control is a moral behavior that may influence the health status of others, subjective norms are more important than a positive or negative attitude with respect to the performance of infection control [28]. According to Ajzen, behaviors with stronger social aspects are more influenced by perceived behavioral control representing the individual's confidence about performance of behavior or by subjective norms reflecting the influence of significant people for the individual than the attitude of the individual [30].

Infection control against MDROs is typically likely to be regarded as a low-priority task in clinical practice if there are problems such as heavy workload, a lack of time or poor accessibility to available facilities. Therefore, there is a need to develop strategies to strengthen subjective norms by presenting positive results obtainable through proper infection control against MDROs, such as a decrease in the incidence rate of MDRO infections, rather than pressuring or requiring individuals to have a positive attitude toward infection control against MDROs. It is also necessary to develop interventional programs including strategies for the enhancement of perceived behavioral control in order to improve ICU nurses' capacity to deal with difficult situations by utilizing various resources. The development and application of such interventional programs are expected to help to enhance behavioral intention and performance regarding infection control against MDROs in ICU nurses.

Conclusions

This study attempted to investigate factors influencing the performance of infection control in ICU nurses of general hospitals based on the theory of planned behavior, and verify the mediating effect of intention, which acts as a motivation factor for performing a behavior, in order to provide basic data for the development of interventional strategies for the enhancement of infection control against MDROs.

With respect to relationships between general characteristics of participants and infection control against MDROs, differences between attitude, subjective norm, perceived behavioral control, intention, and performance regarding infection control against MDROs according to general characteristics of participants were examined. As a result, general characteristics of participants were found to have no significant effect on variables related to infection control. In terms of relationships between major variables from the TPB, although subjective norm, perceived behavioral control, and intention regarding infection control of MDROs were significantly positively correlated with the performance of MDRO infection control. However, attitude toward infection control of MDROs did not have a significant correlation with the performance of MDRO infection control, so attitude was excluded from the analysis to verify the mediating effect of intention. The mediation analysis for the mediation effect of intention revealed that intention had a full mediating effect in the relationship between subjective norm and MDRO infection control performance, and it had a partial mediating effect in the relationship between perceived behavioral control and performance. As a result, subjective norm, perceived behavioral control, and intention were identified as factors affecting MDRO infection control performance among ICU nurses of general hospitals. These study findings suggest that in order to elicit changes in individuals' behavior, it is necessary to enhance perceived behavioral control and subjective norms and thereby increase behavioral intention through measures such as removing factors hindering behavior, utilizing the observer effect, providing continuous feedback, and creating an organizational culture for strengthening infection control against MDROs. However, this study has limitations in generalizing research findings because participants were selected by convenience sampling among ICU nurses of six general hospitals located in a single region, and MDRO infection control behavior was studied by using data was collected not by direct observation but through a self-reported questionnaire survey. Therefore, based on the findings of the present study, this study presents the followings suggestions. First, since this study collected data from ICU nurses in general hospitals located in a single region, there is a need to conduct replication research by expanding the target region and sampling a larger population. Second, it is also necessary to develop intervention programs to enhance infection control performance of MDROs among ICU nurses in general hospitals, based on the findings of this study.

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Conflict of interest

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Authors' contributions

Kim, Nam-Sook contributed to conceptualization, methodology, project administration, visualization, writing-original draft, and investigation. Choi, So-Eun contributed to conceptualization, data curation, formal analysis, methodology, writing-review-editing, and supervision.

Data availability

Please contact the corresponding author for data availability.

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References

1. Lee YS, Kim HS, Yoo JS, Yoo JI, Jung YH. Sentinel surveillance and molecular epidemiology of multidrug resistance bacteria. Korean Journal Clinical Microbiology. 2012;15(2):43–48. https://doi.org/10.5145/KJCM.2012.15.2.43
2. Siegel JD, Rhinehar E, Jackson M, Chiarello L. Management of multidrug-resistant organisms in health care settings, 2006. American Journal of Infection Control. 2007;35(10):165–193. https://doi.org/10.1016/j.ajic.2007.10.006
3. Maragakis LL, Perencevich EN, Cosgrove SE. Clinical and economic burden of antimicrobial resistance. Expert Review Anti-Infective Therapy. 2008;6(5):751–763. https://doi.org/10.1586/14787210.6.5.751
4. Barrasa-Villar JI, Aibar-Remón C, Prieto-Andrés P, Mareca-Doñate R, Moliner-Lahoz J. Impact on morbidity, mortality, and length of stay of hospital-acquired infections by resistant microorganisms. Clinical Infectious Diseases. 2017;65(4):644–52. https://doi.org/10.1093/cid/cix411
5. Korea Centers for Disease Control and Prevention. 2020 Case definitions national notifiable infectious diseases[Internet] Cheongju: Korea Centers for Disease Control and Prevention. 2019 [cited 2020 Jul 02]. Available from: https://www.kdca.go.kr/board/board.es?mid=a20507020000&bid=0019
6. Korea Centers for Disease Control and Prevention. 2020 Healthcare-associated infection control guideline[Internet] Cheongju: Korea Centers for Disease Control and Prevention. 2019 [cited 2020 Feb 26]. Available from: https://www.kdca.go.kr/board/board.es?mid=a20507020000&bid=0019
7. Korean Society for Healthcare-associated infection Control and Prevention. Infection control and prevention in healthcare facilities. 5th ed. Seoul: Hanmibook; 2017. 985 p.
8. Barsanti MC, Woeltje KF. Infection prevention in the intensive care unit. Infectious Disease Clinics of North America. 2009;23(3):703–25.
9. Lee YS, Kim YA, Song WK, Lee HM, Lee HS, Jang SJ, et al. Recent trends in antimicrobial resistance in intensive care units in Korea. Korean Journal of Nosocomial Infection Control. 2014;19(1):29–36. https://doi.org/10.14192/kjnic.2014.19.1.29
10. Oh HS. National survey on nurses' knowledge of infection control in general hospitals and analysis of variables to impact on their knowledge. Journal of Nosocomial Infection control. 2005;10(2):78–86.
11. Oh HS. Current status of infection control of multidrug resistant organisms in hospitals with more than 200 beds in the Republic of Korea. The Korean Journal of Health Service Management. 2014;8(4):163–173. https://doi.org/10.12811/kshsm.2014.8.4.163
12. Jeong SY, Kim OS, Lee JY. The status of healthcare-associated infection control among healthcare facilities in Korea. Journal of Digital Convergence. 2014;12(5):353–366.
13. Health Insurance Review & Assessment Service. Results of adequacy test for intensive care unit in 2017.2nd[Internet] Wonju: Health Insurance Review & Assessment Service. 2018[cited 2018 Aug 23]. Available from: https://www.hira.or.kr/ra/eval/getDiagEvlView.do?pgmid=HIRAA030004000100&WT.ac=%EB%B3%91%EC%9B%90%ED%8F%89%EA%B0%80%EB%B0%94%EB%A1%9C%EA%B0%80%EA%B8%B0
14. Song JO. Perception of multidrug-resistant organisms control in ICU nurses [master's thesis]. [Seoul]: Yonsei University.

2013. 58 p.
15. Shon JA, Park JH. Knowledge and compliance level of the multi-drug resistant organisms of ICU nurses. Journal of the Korea Academia-Industrial Cooperation Society. 2016;17(7):280–292. http://doi.org/10.5762/KAIS.2016.17.7.280
16. Kim SY, Cha CY. Factors related to the management of multidrug resistant organisms among intensive care unit nurses: an application of the health belief model. Journal of Korean Academy Fundamentals of Nursing. 2015;22(3):268–276. https://doi.org/10.7739/jkafn.2015.22.3.268
17. Gu JE, Ha YK, Hwang SH, Gong KH. Path analysis of performance of multi-drug resistant organisms management guidelines among intensive care unit nurses: with focus on the theory of planned behavior and patient safety culture. Journal of Korean Critical Care Nursing. 2018;11(1):89–100
18. Kim JH, Lim KH. The factors influencing compliance of multidrug-resistant organism infection control in intensive care unit nurses. Korean Journal of Adult Nursing. 2015;27(3):325–336. http://doi.org/10.7475/kjan.2015.27.3.325
19. Park YM, Park HS, Park KY. Factors influencing level of awareness and compliance with vancomycin-resistant enterococcus infection control among nurses in intensive care units. Journal of Korean Academy of Fundamentals of Nursing. 2008;15(4):531–538
20. Ajzen I. The theory of planned behavior. Organizational Behavior and Human Decision Processes. 1991;50(2):179–211. https://doi.org/10.1016/0749-5978(91)90020-T
21. Jeong SY, Kim OS. The structural model of hand hygiene behavior for the prevention of healthcare-associated infection in hospital nurses. Korean Journal Adult Nursing. 2012;24(2):119–129. http://doi.org/10.7475/kjan.2012.24.2.119
22. Kim SM. An analysis about the performance of the clinical nurses in nosocomial infection management by applying the theory of planned behavior [master's thesis]. [Daejeon]: Chung Nam National University. 2004. 79 p.
23. Moon JE, Song MO. A convergence study about the performance of healthcare-associated infection control guidelines of hospital nurses-based on the theory of planned behavior. Journal of the Korea Convergence Society. 2017;8(5):117–125. https://doi.org/10.15207/JKCS.2017.8.5.117
24. Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology. 1986;51(6):1173–1182. https://doi.org/10.1037//0022-3514.51.6.1173
25. Sobel ME. Asymptotic confidence intervals for indirect effects in structural equation models. Sociological Methodology. 1982;13:290–312. https://doi.org/10.2307/270723
26. Cha KS, Shin MJ, Lee JY, Chun HK. The Role of infection control nurse during emerging infectious disease epidemic: focusing on the middle east respiratory syndrome. Korean Journal of Healthcare-Associated Infection Control and Prevention. 2017;22(1):31–41. https://doi.org/10.14192/kjhaicp.2017.22.1.31
27. Ministry of Legislation. Enforcement rules of the medical law. Enforcement rules of the medical law article 43(1), article 43(2), article 43(3) [Internet]. Korea: Ministry of Legislation. 2016 [cited 2023 Feb 18]. Available from: https://www.law.go.kr/LSW//lsInfoP.do?lsiSeq=188968&ancYd=20161229&ancNo=00458&efYd=20161230&nwJoYnInfo=N&efGubun=Y&chrClsCd=010202&ancYnChk=0#0000
28. Lee MR, So HY, Cho MK. Determinants of nurses handwashing practice. The Journal of Korean Academic Society of Adult Nursing. 2005;17(2):268–275
29. Kweon OM, Park ES, Lee DS, Lee JH, Ha EJ, Yong DE, et al. A three-year study of the effectiveness of hand-hygiene protocol implementation at a university hospital. Korean Journal Nosocomial Infection Control. 2012;17(2):53–60
30. Ajzen I. Attitudes, personality, and behavior. 2nd ed. NY: Open University Press. 2005. 191 p.

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Gender Differences in Older Adults' Muscle Strength and Depressive Symptoms: A Relationship Mediated Through Perceived Stress

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Purpose: Preventing the effects of physical vulnerability is a practical approach to improving older adults' depressive symptoms. This study aims to examine the relationship between gender differences related to muscle strength and depressive symptoms mediated by perceived stress.
Methods: In this cross-sectional study, data from 2,705 older adults (65 years old or older) from the Korea National Health and Nutrition Examination Survey VII 2016 and 2018 were analyzed. The moderated mediation model was developed; the outcome, independent, mediation, and moderated mediation variables in the literature-based research model were depressive symptoms, muscle strength, perceived stress, and gender, respectively.
Results: Perceived stress had a mediating effect on the relationship between muscle strength and depressive symptoms. The indirect effect of muscle strength on depressive symptoms mediated by perceived stress was β = -.02 (95% CI:-0.03~-0.01). The moderated mediation model demonstrated that the interaction term of handgrip strength and gender negatively affected perceived stress, which indicated that gender moderated the mediating model of perceived stress on the association of muscle strength and depressive symptoms (β = -.01, p <.05). The conditional indirect effect model was insignificant in the male group (β = -.00, 95% CI:-0.01~0.01) but significant in the female group (β = -.01, 95% CI: -0.02~0.00).
Conclusions: Perceived stress mediated the relationship between muscle strength and depressive symptoms. However, the effect differed by gender. A stress- mediated depressive symptoms intervention program for older adults should be developed to consider women's needs.

Keywords: depression; muscle strength; aged; sex

Introduction

Depressive symptoms are prevalent in older adults and a severe public health concern among older adults [1]. A recent meta-analysis has shown that depressive symptoms have increased fourfold among frail people compared to non-frail people [2]. Using muscle strength as one of the important indicators, frailty constitutes a physically vulnerable status and is closely related with depressive symptoms [3-5]. Likewise, older adults are prone to physical limitations, which induce feelings of helplessness [6,7]. The factors mediating the influence of older adults' low muscle strength on depressive symptoms must be elucidated for efficient intervention. Therefore, in this care area, ameliorating the effect of low muscle strength is a practical approach to improving depressive

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symptoms among older adults.

Owing to their physical limitations and lower capacity to manage external stimuli, physically vulnerable older adults may experience higher stress levels and depressive symptoms compared to their robust counterparts [2,4]. Lazarus and Folkman [8] defined "stress" as a relationship between an individual and their environment that is appraised as personally significant and taxing or exceeding one's resources to cope; they also highlighted individual differences in stress response according to appraisals of stressful situations and the resources available for managing stress. When frail people are exposed to stressful situations, they experience greater stress. This is because their vulnerable physical status restricts their daily life and causes more discomfort [4], manifesting as decreased motor function and quality of life [9]. Physical activity also affects the release of neurotransmitters and myokines, which are significantly associated with stress response [10].

Stress is significantly associated with depressive symptoms [7,11]. Older adults experience various stressful situations owing to decreased muscle strength [6,7]. Moreover, the degree of stress is associated with the intensity and duration of stressful life events and the ability to manage them. Smith et al. [12] examined the relationship between muscle strength, depressive symptoms, and stress; however, in their study, gender was simply considered a confounder. Additionally, many studies have examined the relationships between muscle strength, depressive symptoms, and stress [3,4,7,11]. However, research on the relationship between the three variables, namely, muscle strength, depressive symptoms, and stress is scant. Therefore, there is a need for further research to understand the relationship more accurately.

Depressive symptoms show gender differences; females show more severe depressive symptoms than males [13]. The factors causing gender differences can be considered in endogenous and exogenous aspects. As endogenous aspects, females' peak muscle mass is lower than males' [14,15]. Thus, female older adults reach frailty status and are exposed to situations that may limit their daily lives earlier than males [5]. One study showed greater activation in the Hypothalamic-Pituitary-Adrenal (HPA) axis and autonomic nervous system during stress response in the male group compared to the female group [16]. As for exogenous aspects, scholars point to socio-cultural factors. Females experience chronic stress by taking caregiver roles in most families [17]. In addition, the unfairness of education and social participation opportunities between the genders in the past have contributed to today's economic inequality [18]. Sufficient socioeconomic factors act as a buffer for stress, but females' capacity for coping with stress tends to be weak, caused by accumulated external factors.

Considering previous studies, gender differences must be understood in terms of the relationship between physical and psychological vulnerability. Therefore, this study aimed to examine the gender differences concerning muscle strength and depressive symptoms mediated by perceived stress by using data from the Korea National Health and Nutrition Examination Survey (KNHANES) VII.

Methods

1. Study Design and Participants

This study is a cross-sectional study. The data for this study were drawn from the 2016 and 2018 waves of KNHANES VII, which were obtained from the Korea Disease Control and Prevention Agency (https://knhanes.kdca.go.kr/). The KNHANES is a national surveillance system that represents the Korean people's health status. More details on the data collection process are available [19]. From the available data, participants aged 65 years or older were selected. Among them, those with physical disabilities owing to dementia or with missing values for grip strength, perceived stress, and depressive symptoms were excluded. Ultimately, the data of 2,705 participants were used in the analysis.

2. Measures

1) Muscle strength

Handgrip strength is an independently valuable indicator reflecting physical status and has been included as an indicator in the Cardiovascular Health Study frailty scale [5]. Handgrip strength has been reported to have excellent reliability and validity; it can be measured in healthy participants and those with clinical diseases [20]. When diagnosing sarcopenia, the Asian Working Group for Sarcopenia and the European Working Group on Sarcopenia in Older People used muscle strength via handgrip strength as one of the indicators for screening physical status [21]. We used the handgrip strength variable provided in KNHANES, which was measured with a digital grip dynamometer. The maximum value between the left and right handgrip strength was used for the muscle strength variable.

2) Depressive symptoms

Depressive symptom was a dependent variable in our study, assessed with the nine-item Patient Health Questionnaire based on self-reported measures [22]. The total score ranged from 0-27 in a continuous variable, and higher scores indicated higher degrees of depression.

3) Perceived stress

Perceived stress was a mediating variable of this study. The KNHANES asked participants one question on the degree of perceived stress, to which the responses could be *extremely stressed* (four points), *quite stressed* (three points), *a little bit stressed* (two points), or *hardly stressed* (one point). A higher score indicated a higher stress level.

4) Covariates

Demographic variables included age (years), residential area (urban vs. rural), education attainment (years), household income (low, middle-low, middle, middle-high, or high), marital status (living with spouse vs. not living with a spouse, widowed, or divorced or never married). Education attainment was categorized as 6 years or less (elementary), 7-9 years (middle school), 10-12 years (high school), and 13 years or more (college). Health-related variables included current smoking (yes vs. no), high-risk drinking (yes vs. no), history of depression treatment (yes vs. no), and the number of chronic diseases [12,23]. Specifically, high-risk drinking refers to having more than seven glasses of alcohol twice a week for males and drinking more than five glasses twice a week for females. Given that treatment for depression could affect the degree of depression, it was included as a covariate. Regarding the number of chronic diseases, participants were asked whether they have been diagnosed with the following 10 kinds of chronic diseases by a physician: hypertension, osteoarthritis, diabetes, cerebrovascular disease, cardiomyopathy, angina, asthma, kidney disease, chronic obstructive lung disease, and cancer (colon, stomach, liver, breast, cervical, lung, thyroid, and other cancers). Each item was allocated 1 for "yes" and 0 for "no," and a higher total score indicated having more chronic diseases (Table 1).

3. Statistical Analysis

We conducted a complex sample analysis by applying colonies, stratification variables, and the weights of the 2016 and 2018 data. First, we derived descriptive statistics to show the general characteristics. Second, we performed a correlation analysis between variables, including the main variables and covariates. Third, we confirmed a simple mediation model of stress among all participants. Fourth, we confirmed the moderated mediation model adjusted by gender as a moderator variable; we used SPSS PROCESS macro, version 3.5.3, developed by Preacher and Hayes, to test the mediation hypothesis. Complex sampling design was not applied in mediation model and moderated mediation model analysis using PROCESS macro.

The moderated mediation analysis was performed based on 5,000 bootstrapped samples using bias-corrected and accelerated 95% confidence intervals (model 7 in PROCESS macro). Mean-centering was used for continuous variables. We then examined the relations among the independent variable X (handgrip strength), dependent variable Y (depressive symptom), mediator M (perceived stress), and moderator W (gender; Figure 1). The conditional process model could be specified using regression equations for M and Y, with the two equations allowing the effect of X to be dependent on W; however, the effect of M on Y to be fixed. Hence, this equation could be modified by including W and XW as predictors to allow the direct effect of X to be moderated by W [24]. Therefore, moderated mediation existed when the following requirements were met: (i) In the regression equation of the mediator, the moderated effect of the moderator between the independent variable and mediator should be significant; (ii) In the regression equation of the independent variable to the dependent variable, the independent variable, and moderator interaction terms should not be significant; (iii) In the regression equation of the independent variable and mediator to the dependent variable, the mediator should be significant [25].

4. Ethical considerations

As secondary data were used in this study, it was exempt from requiring approval by the appropriate institutional review board (IRB No. SNU 21-08-069).

Results

1. Descriptive Analysis

Table 1 gives the general characteristics of the study population by gender. It includes age, residential area, education attainment, household income, marital status, current smoking, high-risk drinking, history of depression treatment, number of chronic diseases, muscle strength, perceived stress, and depressive symptoms. The correlation between variables showed significant relations between handgrip strength and perceived stress ($\beta = -.07$, $p < .01$), between handgrip strength and depressive symptoms ($\beta = -.19$, $p < .01$), and between perceived stress and depressive symptom ($\beta = .34$, $p < .01$; Table 2).

2. Mediating Effect of Perceived Stress on Relations Between Muscle Strength and Depressive Symptoms

Muscle strength was negatively associated with perceived stress ($\beta = -.01$, $p < .05$) and depressive symptoms ($\beta = -.06$, $p < .05$). The negative effect of muscle strength on depressive symptoms

Table 1. General Characteristics of the Study Population by Gender

Characteristics		Total (n = 2,705) n (%) or Mean ± SE	Male (n = 1,218) n (%) or Mean ± SE	Female (n = 1,487) n (%) or Mean ± SE	x^2 or t	*p*
Demographics						
Age		72.68 ± 0.14	72.14 ± 0.19	73.13 ± 0.17	-4.25	< .001
Residential area	Urban	2013 (78.9)	916 (80.0)	1097 (78.2)	1.29	.225
	Rural	692 (21.1)	302 (20.0)	390 (21.8)		
Education attainment (years)	≦6	1379 (50.6)	391 (30.9)	988 (66.1)	375.21	< .001
	7–9	513 (18.3)	261 (20.9)	252 (16.3)		
	10–12	490 (18.5)	331 (27.4)	159 (11.5)		
	≧13	322 (12.6)	235 (20.7)	87 (6.2)		
	NA	1 (0.0)	0 (0.0)	1 (0.0)		
Household income	Low	1193 (43.3)	470 (37.2)	723 (48.1)	40.19	< .001
	Middle-low	647 (23.3)	300 (24.0)	347 (22.8)		
	Middle	376 (14.0)	196 (16.7)	180 (11.9)		
	Middle-high	255 (9.8)	131 (11.5)	124 (8.5)		
	High	221 (8.5)	114 (9.6)	107 (7.6)		
	NA	13 (1.0)	7 (0.8)	6 (1.1)		
Marital status	Not living with a spouse (widowed or divorced or never married)	862 (34.5)	156 (12.8)	706 (51.6)	447.93	< .001
	Living with spouse	1842 (65.4)	1062 (87.2)	780 (48.2)		
	NA	1 (0.1)		1 (0.2)		
Health-related variables						
Current smoking	No (former or never)	2468 (91.3)	1014 (83.1)	1454 (97.9)	190.59	< .001
	Yes	235 (8.6)	204 (16.9)	31 (2.0)		
	NA	2 (0.1)		2 (0.1)		
High-risk drinking	No	2595 (95.7)	1116 (90.9)	1479 (99.6)	123.16	< .001
	Yes	110 (4.3)	102 (9.1)	8 (0.4)		
History of depression treatment	No	2627 (97.1)	1200 (98.7)	1427 (95.9)	18.66	< .001
	Yes	78 (2.9)	18 (1.3)	60 (4.1)		
Number of chronic diseases (range: 0–10)		1.40 ± 0.02	1.25 ± 0.03	1.51 ± 0.03	-5.63	< .001
Main variables						
Muscle strength (kg)		25.4 ± 0.23	33.03 ± 0.23	19.38 ± 0.19	50.92	< .001
Perceived stress (range: 1–4)		3.14 ± 0.20	3.23 ± 0.02	3.07 ± 0.03	4.89	< .001
Depressive symptom (range: 0–27)		2.43 ± 0.09	1.69 ± 0.10	3.02 ± 0.14	-8.12	< .001

Notes. Unweighted numbers, weighted percentages (%), and chi-squared values are presented for categorical variables. Mean ± SE and t-values are presented for continuous variables. Those "not living with a spouse" include widowed, divorced, or never married individuals. "Current smoking: No" includes those who have never smoked or those who used to smoke in the past but no longer do so.
NA = not applicable.

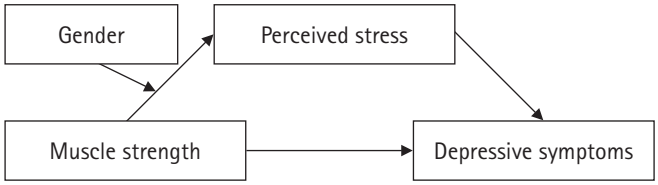

Figure 1. Research model of this study.
Muscle strength, independent variable; depressive symptoms, dependent variable; perceived stress, mediation variable; gender, moderated mediation variable.

tionship between muscle strength and depressive symptoms mediated by perceived stress and identified gender differences in the mediating effect of perceived stress. In particular, the results revealed that the conditional indirect effect model according to gender was not significant in the male group but was significant in the female group. This model explained the results from biological and social perspectives.

In this study, the mediating effect of perceived stress in the rela-

was significant (β = -.04, p < .05) when both muscle strength and perceived stress were concurrently included. The indirect effect of muscle strength on depressive symptoms mediated by perceived stress was β = -.02 (95% CI: -0.03~0.01) (Table 3), indicating the mediating effect of perceived stress on the relationship between muscle strength and depressive symptoms.

Table 2. Correlation Coefficient Among the Variables (N = 2,705)

Variable	Muscle strength	Perceived stress	Depressive symptoms
Muscle strength	-		
Perceived stress	-.072***	-	
Depressive symptoms	-.186***	.342***	-

Notes. Demographic variables (age, residential area, education attainment, household income, marital status) and health-related variables (current smoking, high-risk drinking, history of depression treatment, number of chronic diseases) were omitted in this table.
*p <.05, **p <.01, ***p <.001.

3. Gender Differences in the Mediation Model of Perceived Stress on Relations Between Muscle Strength and Depressive Symptoms

We analyzed the relations between muscle strength, perceived stress, and depressive symptoms using gender as a moderator, controlling for demographic and health-related variables among all participants. Table 4 shows that the interaction term of handgrip strength and gender had a negative effect on perceived stress (β = -.01, p < .05). Specifically, the conditional indirect effect model according to gender was not significant in the male group (β = -.00, 95% CI: -0.01~0.01), but was significant in the female group (β = -.01, 95% CI: -0.02~-0.00).

Discussion

Effective interventions for alleviating depressive symptoms should be provided to guarantee a good life in old age. Hence, the relationship between physical and psychological vulnerability must be thoroughly understood. Our study examined the rela-

Table 3. Estimation of the mediation effect between muscle strength, perceived stress, and depressive symptom (N = 2,705)

Variables	X→M				X→Y				X→M→Y			
	Outcome variable: Perceived stress (M)				Outcome variable: Depressive symptom (Y)				Outcome variable: Depressive symptom (Y)			
	β	SE	t	95% CI	β	SE	t	95% CI	β	SE	t	95% CI
Muscle strength (X)	-.01	0.00	-5.41	-0.02, -0.01	-.06	0.01	-6.23	-0.08, -0.04	-.04	0.01	-4.69	-0.06, -0.03
Perceived stress (M)									1.67	0.09	18.02	1.49, 1.85
R^2	.05				.09				.18			
F	13.19				24.77				54.76			
Indirect effect	Effect (β): -.02, SE:0.00, 95% CI: -0.03, -0.01											

Notes. All the values are unstandardized. Model 4 of the PROCESS macro is used. Covariance: age, residential area, education, household income, marital status, current smoking, high-risk drinking, number of chronic diseases.

Table 4. Estimation of the relation between muscle strength, perceived stress, and depressive symptoms, moderated by gender (N=2,705)

Variables	Outcome variable: Perceived stress				Outcome variable: Depressive symptoms			
	β	SE	t	95% CI	β	SE	t	95% CI
Muscle strength	.01	0.01	1.35	-0.01, 0.03	-.04	0.01	-4.69	-0.06, -0.03
Gender	.13	0.05	2.57	0.03, 0.23				
Muscle strength × Gender	-.01	0.01	-2.17	-0.02, 0.00				
Perceived stress					1.67	0.09	< .001	1.49, 1.85
R^2	.05				.18			
F	12.12				54.76			
Conditional indirect effect	Gender			Effect (β)	SE	t		95% CI
	Male			.00	0.00	-0.34		-0.01, 0.01
	Female			-.01	0.00	-2.84		-0.02, 0.00
	Moderation mediation index = -0.019							-0.04, 0.00

Notes. All values are unstandardized. Model 7 of the PROCESS macro is used. In gender variable, male is reference. Covariance: age, residential area, education attainment, household income, marital status, current smoking, high-risk drinking, history of depression treatment, number of chronic diseases.

tionship between muscle strength and depressive symptoms was significant. Muscle strength/mass can reflect the quality of muscle [12], and myokines are associated with older adults' mood [26]. Although the exact mechanism has not been confirmed, it may be assumed that the quality of muscles affects stress response. In the human body, muscles work as endocrine organs. Interleukin-6, a type of myokine released from muscle fibers, is secreted in response to stress and is involved in cortisol secretion in the adrenal gland. Therefore, the circulating level of interleukin-6 is raised by stress [10,26]. In other words, a physically vulnerable state such as muscle weakness leads to greater susceptibility to stress owing to the decrease in endocrine coping function against stress [10]. Long-term exposure to stress causes a chronic stress condition, which increases cortisol resistance and results in depressive symptoms [7,10,12].

Additionally, physical vulnerability such as low muscle strength status can lead to functional limitations and physical inactivity. Older adults' vulnerable physical condition can be a contributing factor that induces social isolation, increases perceived stress, and worsens the stress-coping base [27,28]. Increased perceived stress could lead to the development of depressive symptoms [2,3,4]. Physically vulnerable older adults are less likely to engage in social activities. Therefore, it is important to reduce the social isolation attributable to their physical vulnerability [28]. Prevention of muscle weakness should be fundamental. Moreover, additional institutional support to prevent physical vulnerability from acting as a stressor in older adults' daily lives is crucial.

The mediating effect of perceived stress differs by gender. The mediating effect of perceived stress was only significant among females in the moderated mediation model of our study. This result indicates that the perceived stress response to decreased muscle strength differs according to gender. This difference can be explained by hormonal responses and sensitivity to stress sources [4,16,29]. First, the physiological system response to stress is mainly explained by responses of the autonomic nervous system and HPA axis [30]. Female gender hormones weaken the sympathoadrenal response and delay cortisol feedback of the HPA axis [16]. Although hormone medication and blood hormone levels were not investigated in the KNHANES, judging from the demographic and health-related variables in this study, the difference by gender can be presumed to be a result of delayed response of myokines or neurotransmitters to stress by gender hormone effects.

Second, sensitivity to stressors differs by gender. In a previous study, stressors caused sadness or anxiety, which manifested more in physical responses and behaviors in females because females more cognitively focus on sadness or anxiety than males [31]. The environment to which males and females have been exposed also contributes to the differences in sensitivity. Consequently, females tend to consider stressors more threatening [6]. According to a study conducted on twin pairs (male-male, female-female, and male-female) that considered social aspects, females are more sensitive to the depressogenic effects of proximal and distal networking with individuals [32]. The buffer function of interactions with close networks has also been reported in another study [7]. Sensitivity to stress sources can be complemented by the socioeconomic basis of stress management. Gender roles have weakened the stress-coping function of the current female older adult generation [29]. For these study participants, the household income and education attainment gaps between men and women were significant. However, younger male and female generations have experienced similar educational and work environments. Moreover, the socioeconomic gap is less prominent [16,18]. Until the gap is completely bridged, the influence of gender roles accumulated in the past cannot be ignored. In terms of appraising the situation positively and developing coping strategies for stressors [30,33], encouraging social interaction to alleviate stress is expected to be an effective intervention for female older adults' depressive symptoms.

With aging, adults experience fluctuating cortisol cycles owing to dysfunction of the HPA axis, inhibiting the proper stress response [16]. Physical activity or financial compensation interventions improve older adults' psychological health [34]. However, most of them have been implemented without consideration for participants' gender [12]. Our results highlighted the effect of gender on the pathway of psychological vulnerability among older adults. Even if the biological mechanism for stress response is different according to gender [16,35], gender roles and other external factors play more critical roles in coping with stress [36]. Meanwhile, non-pharmacological interventions (e.g., exercise, psychotherapy, and cognitive behavior therapy) have also been applied to older adults. However, there is a need for further research to confirm the applicability of these interventions in this care area [37]. This study's results thus suggest practical interventions that may benefit older adults.

Our study has several limitations. First, the perceived stress variable was measured by a one-question questionnaire. Future works may use structured questionnaires (e.g., Perceived stress scale, Standard stress scale) or clinical indicators, such as pathological information (e.g., cortisol, epinephrine, norepinephrine), to measure stress [38]. Secondly, gender difference was only interpreted comprehensively and extensively in terms of social, economic,

and stress coping because KNHANES dataset did not include biological indicators of gender differences, such as sex hormone concentrations. Third, the causal relationship between variables could not be determined because of the study's cross-sectional design. Future research using objective measurements and longitudinal data is needed to prove the causal relationship between muscle strength, perceived stress, and depressive symptoms.

Conclusions

Depressive symptoms in community-dwelling older adults are a severe public health concern. Moreover, the factors related to depressive symptoms show gender differences. Therefore, this study examined the gender differences concerning muscle strength and depressive symptoms mediated by perceived stress. The findings from this study suggested that perceived stress had a mediating effect on the relation between muscle strength and depressive symptoms, but the effect differed by gender. These findings have important implications for public health nurses to develop depressive symptoms intervention for older adults. A stress-mediated depressive symptoms intervention program should be developed with consideration for females' needs.

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Conflict of interest

Ju Young Yoon is an editorial board member of the Journal of Korean Community Health Nursing. She will not involve in the review process of this manuscript. No conflict of interest has been declared by authors.

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Authors' contributions

Gyeong A Kang contributed to conceptualization, data curation, formal analysis, methodology, project administration, and writing – original draft, review & editing. Jihye Shin contributed to conceptualization, methodology, and writing – review & editing. Ju Young Yoon contributed to conceptualization, writing – review & editing, supervision, and validation.

Data availability

Or note how data can be made available such as follows: The Korea National Health and Nutrition Examination Survey (KNHANES) were obtained from the Korea Disease Control and Prevention Agency (https://knhanes.kdca.go.kr/). More details on the data collection process are available (https://doi.org/10.1093/ije/dyt228).

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References

1. Hu T, Zhao X, Wu M, Li Z, Luo L, Yang C, Yang F. Prevalence of depression in older adults: A systematic review and meta-analysis. Psychiatry Research. 2022;311:114511. http://doi.org/10.1016/j.psychres.2022.114511
2. Soysal P, Veronese N, Thompson T, Kahl KG, Fernandes BS, Prina AM, et al. Relationship between depression and frailty in older adults: A systematic review and meta-analysis. Ageing Research Reviews. 2017;36:78–87. http://doi.org/10.1016/j.arr.2017.03.005
3. Cao L, Zhou Y, Liu H, Shi M, Wei Y, Xia Y. Bidirectional longitudinal study of frailty and depressive symptoms among older Chinese adults. Frontiers in Aging Neuroscience. 2022;14:791971. http://doi.org/10.3389/fnagi.2022.791971
4. Desrichard O, Vallet F, Agrigoroaei S, Fagot D, Spini D. Frailty in aging and its influence on perceived stress exposure and stress-related symptoms: evidence from the Swiss Vivre/Leben/Vivere study. European Journal of Ageing. 2018;15(4):331–338. http://doi.org/10.1007/s10433-017-0451-2
5. Fried LP, Ferrucci L, Darer J, Williamson JD, Anderson G. Untangling the concepts of disability, frailty, and comorbidity: implications for improved targeting and care. The Journals of Gerontology:Series A. 2004;59(3):M255–M263.

https://doi.org/10.1093/gerona/59.3.M255
6. Folkman S. Stress: appraisal and coping. In: Gellman MD, Turner JR, editors. Encyclopedia of Behavioral Medicine. NY: Springer New York; 2013. p. 1913–1915.
7. Tafet GE, Nemeroff CB. The links between stress and depression: Psychoneuroendocrinological, genetic, and environmental interactions. The Journal of Neuropsychiatry and Clinical Neuroscience. 2016;28(2):77–88. http://doi.org/10.1176/appi.neuropsych.15030053
8. Lazarus R, Folkman S. Stress, appraisal, and coping. NY: Springer Publishing Company; 1984. 444 p.
9. Cabanas-Sánchez V, Esteban-Cornejo I, Parra-Soto S, Petermann-Rocha F, Gray SR, Rodríguez-Artalejo F, et al. Muscle strength and incidence of depression and anxiety: findings from the UK biobank prospective cohort study. Journal of Cachexia, Sarcopenia and Muscle. 2022;13(4):1983–1994. http://doi.org/10.1002/jcsm.12963
10. Severinsen MCK, Pedersen BK. Muscle-Organ Crosstalk: The emerging roles of myokines. Endocrine Reviews. 2020;41(4):594–609. http://doi.org/10.1210/endrev/bnaa016
11. Kim SE, Kim HN, Cho J, Kwon MJ, Chang Y, Ryu S, et al. Direct and indirect effects of five factor personality and gender on depressive symptoms mediated by perceived stress. PloS One. 2016;11(4):e0154140. http://doi.org/10.1371/journal.pone.0154140
12. Smith L, Firth J, Grabovac I, Koyanagi A, Veronese N, Stubbs B, et al. The association of grip strength with depressive symptoms and cortisol in hair: A cross-sectional study of older adults. Scandinavian Journal of Medicine & Science in Sports. 2019;29(10):1604–1609. http://doi.org/10.1111/sms.13497
13. Noh HM, Park YS. Handgrip strength, dynapenia, and mental health in older Koreans. Science Reports. 2020;10(1):4004. http://doi.org/10.1038/s41598-020-60835-4
14. Fried LP, Tangen CM, Walston J, Newman AB, Hirsch C, Gottdiener J, et al. Frailty in older adults: Evidence for a phenotype. The Journals of Gerontology: Series A. 2001;56(3):M146–M157. http://doi.org/10.1093/gerona/56.3.m146
15. Soh Y, Won CW. Sex differences in association between body composition and frailty or physical performance in community-dwelling older adults. Medicine. 2021;100(4):e24400. http://doi.org/10.1097/MD.0000000000024400
16. Verma R, Balhara YP, Gupta CS. Gender differences in stress response: Role of developmental and biological determinants. Industrial Psychiatry Journal. 2011;20(1):4–10. http://doi.org/10.4103/0972-6748.98407
17. Swinkels J, Tilburg Tv, Verbakel E, Broese van Groenou M. Explaining the gender gap in the caregiving burden of partner caregivers. The Journals of Gerontology: Series B. 2017;74(2):309–317. https://doi.org/10.1093/geronb/gbx036
18. Angrisani M, Lee J, Meijer E. The gender gap in education and late-life cognition: Evidence from multiple countries and birth cohorts. Journal of the Economics of Ageing. 2020;16:100232. https://doi.org/10.1016/j.jeoa.2019.100232
19. Kweon S, Kim Y, Jang MJ, Kim Y, Kim K, Choi S, et al. Data resource profile: the Korea National Health and Nutrition Examination Survey (KNHANES). International Journal of Epidemiology. 2014;43(1):69–77. https://doi.org/10.1093/ije/dyt228
20. Bobos P, Nazari G, Lu Z, MacDermid JC. Measurement properties of the hand grip strength assessment: A systematic review with meta-analysis. Archives of Physical Medicine and Rehabilitation. 2020;101(3):553–565. https://doi.org/10.1016/j.apmr.2019.10.18321
21. Cruz-Jentoft AJ, Bahat G, Bauer J, Boirie Y, Bruyère O, Cederholm T, et al. Sarcopenia: revised European consensus on definition and diagnosis. Age and Ageing. 2019;48(4):601. https://doi.org/10.1093/ageing/afz046
22. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. Journal of General Internal Medicine. 2001;16(9):606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x
23. Kim H, Jeong W, Kim SH, Park YS, Jang SI, Park EC. Association between changes in handgrip strength and depression in Korean adults: a longitudinal panel study. Science Reports. 2022;12(1):13643. https://doi.org/10.1038/s41598-022-18089-9
24. Hayes AF, Rockwood NJ. Conditional process analysis: Concepts, computation, and advances in the modeling of the contingencies of mechanisms. 2020;64(1):19–54. https://doi.org/10.1177/0002764219859633
25. Hayes AF. An index and test of linear moderated mediation. Multivariate Behavioral Research. 2015;50(1):1–22. https://doi.org/10.1080/00273171.2014.962683
26. Mucher P, Batmyagmar D, Perkmann T, Repl M, Radakovics A, Ponocny-Seliger E, et al. Basal myokine levels are associated with quality of life and depressed mood in older adults. Psychophysiology. 2021;58(5):e13799. https://doi.org/10.1111/psyp.13799
27. Ashdown-Franks G, Koyanagi A, Vancampfort D, Smith L, Firth J, Schuch F, et al. Sedentary behavior and perceived stress among adults aged ≥50 years in six low- and middle-income countries. Maturitas. 2018;116:100–107. https://doi.org/10.1016/j.maturitas.2018.08.005

28. Davies K, Maharani A, Chandola T, Todd C, Pendleton N. The longitudinal relationship between loneliness, social isolation, and frailty in older adults in England: a prospective analysis. The Lancet Healthy longevity. 2021;2(2):e70–e77. https://doi.org/10.1016/S2666-7568(20)30038-6
29. Salk RH, Hyde JS, Abramson LY. Gender differences in depression in representative national samples: Meta-analyses of diagnoses and symptoms. Psychological Bulletin. 2017;143(8):783–822. https://doi.org/10.1037/bul0000102
30. Zapater-Fajarí M, Crespo-Sanmiguel I, Pulopulos MM, Hidalgo V, Salvador A. Resilience and psychobiological response to stress in older reople: The mediating role of coping strategies. Frontiers in Aging Neuroscience. 2021;13:632141. https://doi.org/10.3389/fnagi.2021.632141
31. Slavich GM, Sacher J. Stress, sex hormones, inflammation, and major depressive disorder: Extending social signal transduction theory of depression to account for sex differences in mood disorders. Psychopharmacology. 2019;236(10):3063–3079. https://doi.org/10.1007/s00213-019-05326-9
32. Kendler KS, Thornton LM, Prescott CA. Gender differences in the rates of exposure to stressful life events and sensitivity to their depressogenic effects. The American Journal of Psychiatry. 2001;158(4):587–593. https://doi.org/10.1176/appi.ajp.158.4.587
33. Tugade MM, Fredrickson BL. Resilient individuals use positive emotions to bounce back from negative emotional experiences. Journal of Personality and Social Psychology. 2004;86(2):320–333. https://doi.org/10.1037/0022-3514.86.2.320
34. Gopinath B, Kifley A, Flood VM, Mitchell P. Physical activity as a determinant of successful aging over ten years. Scientific Reports. 2018;8(1):10522. https://doi.org/10.1038/s41598-018-28526-3
35. Goldfarb EV, Seo D, Sinha R. Sex differences in neural stress responses and correlation with subjective stress and stress regulation. Neurobiology of Stress. 2019;11:100177. https://doi.org/10.1016/j.ynstr.2019.100177
36. Lundberg U. Stress hormones in health and illness: the roles of work and gender. Psychoneuroendocrinology. 2005;30(10):1017–1021. https://doi.org/10.1016/j.psyneuen.2005.03.014
37. Holvast F, Massoudi B, Oude Voshaar RC, Verhaak PFM. Non-pharmacological treatment for depressed older patients in primary care: A systematic review and meta-analysis. PloS One. 2017;12(9):e0184666. https://doi.org/10.1371/journal.pone.0184666
38. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. Journal of Health and Social Behavior. 1983;24(4):385–396. https://doi.org/10.2307/2136404

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아파트 경비원의 피로도, 감정노동이 수면의 질에 미치는 영향

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Effects of Fatigue and Emotional Labor on Sleep Quality among Apartment Security Guards

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Purpose: This study aimed to identify the effects of fatigue and emotional labor on the quality of sleep among apartment security guards.
Methods: A total of 196 apartment security guards working in 10 different regions participated in the study between July and October 2022, completing questionnaire assessing fatigue (physical imbalance, exhaustion, mental fatigue, and nervous system disfunction), emotional labor, and sleep quality. Data were analyzed using descriptive statistics, independent t-test, Mann-Whitney U test, ANOVA including Scheffe's post hoc, and regression analysis.
Results: 183(93.4%) participants were poor sleeper. Regression analysis of the factors influencing sleep quality yielded a significant model (F= 21.56, p<.001) with an explanatory power of 25.0% in the order of fatigue(exhaustion) (β=.28, p<.001), emotional labor (β=.27, p<.001), and subjective economic status (β=.15, p=.017).
Conclusion: It is essential to develop nursing educational programs that reduce exhaustion and emotional labor for improving the quality of sleep.

Keywords: Occupational groups, Fatigue, Work, Sleep Quality

주요어: 아파트 경비원, 피로도, 감정노동, 수면의 질
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서론

1. 연구의 필요성

근로자들에게 있어 수면의 질 저하는 인체의 호르몬과 생리적 기전을 변화시켜 육체적·정신적 건강문제를 일으키고, 업무의 효율성 저하 및 사고발생의 위험을 높여 산업재해 등의 문제를 야기하게 되므로[1-3], 근로자들을 대상으로 수면의 질을 관리하는 것이 필요하다. 특히, 교대 및 야간 근무와 장시간 근무는 수면에 부정적인 영향을 주어[1], 교대근무자들은 수면의 질이 낮다[2,4]. 불만이 많은 고객을 항상 응대해야 하는 감정노동자 또한 불만 고객을 거의 응대하지 않는 감정노동자에 비해 수면장애를 약 4배 정도 더 경험하는 것으로 알려져 있다[5]. 이에, 교대근무 및 감정노동을 하는 직업군에 속하는 근로자들을 대상으로 수면장애를 관리할 필요가 있다.

교대근무와 감정노동이 큰 직업군[6-8]으로 알려진 아파트 경비원은 한국표준직업 분류상 단순노무종사자 중 청소 및 경비 관련 단순노무직에 속하는 직업으로 아파트 내·외부 순찰, 출입자 통제, 각종 시설물 유지 및 관리, 주차관리, 쓰레기 분리수거, 우편 및 택배관련 업무, 주민 민원 응대 등을 담당한다[9,10]. 아파트 경비원의 근무 현황에 대한 정확한 통계는 없지만, 2021년에 등록된 시설경비원은 165,592명에 달하고 있으며[11], 아파트 경비원은 이전 직장 퇴직 후 재취업한 중·장년 및 노년층 남성 근로자가 많아[9,12], 55세 이상이 99%를 차지하고 있다[13]. 아파트 경비원은 이러한 중장년층의 연령 특성과[14] 24시간 격일로 교대·야간근무를 하고, 비좁은 경비초소에서 수면을 해결하는 근무 특성으로[9,10] 인해 수면의 질이 낮아 아파트 경비원의 약 88%에서 수면의 질이 낮 것으로 보고되고 있어[9], 아파트 경비원들의 수면의 질에 영향을 미치는 요인을 파악하여 이에 대해 개선하는 것이 요구되고 있다. 교대 근무자들의 수면의 질에 영향을 미치는 요인에는 교대 및 야간근무로 인한 내인성 일주기 리듬(endogenous circadian rhythm)의 방해[15] 이외에도 연령, 결혼상태, 소득만족도, 카페인 섭취, 음주, 흡연, 근무형태, 근무시간, 야간 근무수, 주당근무시간[1,3,4,8], 피로도[3,4,8], 감정노동[3], 우울[8] 등이 있다.

이 중 아파트 경비원에게 있어 피로도는 아파트 경비원 업무에 대한 육체적·정신적 부담을 느껴 업무의 능률이 떨어지고 신체적·정신적 에너지 균형을 깨지게 하는 것으로[16], 수면의 질에 부정적인 영향을 미친다[3,5]. 아파트 경비원은 과도한 업무와 열악한 복지 조건 등으로 직무스트레스가 높고, 돌발 상황에 대응하기 위해 잦은 긴장 속에서 생활하기 때문에 육체적·정신적 피로도가 높다[16]. 피로는 일상생활 속에서 육체적 힘을 소진한 후 지친 상태로 현재 활동에 대한 의욕이 없는 것으로, 휴식이나 수면으로 해소될 수 있다[16]. 그렇지만, 교대근무가 계속되면 피로가 쉽게 쌓이고, 누적된 피로는 수면을 방해하여 정상적인 수면 리듬을 깨뜨리고 수면의 질을 저하시킨다. 더욱이 수면부족이 가중되면 피로가 더 쌓이는 악순환으로 이어져[3], 결국 피로로 인한 수면부족은 신체적, 정신적 장애 뿐만 아니라 노동력 저하까지 가져올 수 있으므로[16,17], 피로 감소를 통한 수면의 질을 높이는 것이 필요하다.

아울러, 아파트 경비원은 아파트 입주민을 응대하며 감정노동을 많이 할 수밖에 없는 직업군이다[8]. 감정노동은 근로자가 업무 수행 시 자신이 느끼는 실제 감정과는 다르게 표현하도록 요구되는 것으로, 아파트 경비원의 감정노동은 아파트 입주민 응대 등의 업무수행과정에서 자신의 감정을 억누르고 실제로 느끼는 감정과는 다르게 감정을 표현하도록 업무와 조직관계에서 요구되는 노동을 말한다[18]. 아파트 경비원들이 겪게 되는 감정노동의 원인에는 계약 방식, 업무범위, 입주민들의 태도 등이 있다. 아파트 경비원의 대부분은 위탁관리나 용역업체를 통한 간접고용형태로 매년 계약을 갱신해야 하는데, 입주민과의 민원 발생이 적어야 재계약이 가능하므로 입주민의 부당한 대우를 참는 경우가 많다. 또한, 경비법에서 정한 경비업무 외에 부수적인 업무를 하게 되지만, 이에 대한 부당함을 표현하기 어렵고, 모욕적인 입주민들의 응대에도 다른 직업을 찾기 힘들기 때문에 참게 되면서 상당한 감정노동을 겪는다[7,10]. 일부 입주민들은 본인들이 매월 부담하는 관리비의 일부가 아파트 경비원의 급여가 되기 때문에 아파트 경비원이 자신들을 위해 존재하는 직종으로 여겨 갑질을 하기도 한다[8]. 아파트 경비원들은 입주민들의 욕설과 질책 등 비인격적인 대우 등으로 인한 감정노동으로 인해 자살에 이르기도 하며[19], 수면의 질도 저하되고 있어[5] 이에 대한 중재가 요구된다.

이렇듯 아파트 경비원들이 겪는 피로, 감정노동은 수면의 질 저하에 영향을 주고 있으나, 피로와 감정노동이 수면의 질에 미치는 영향을 파악한 선행연구는 미흡한 상황이다. 아파트 경비원을 대상으로 한 선행연구로는 아파트 경비원 실태조사[11,13,20], 언어적·신체적 폭력피해 경험과 직무스트레스[6], 감정노동[7], 삶의 질[9] 등이 있다. 이에, 본 연구에서 아파트 경비원에게 있어 피로도, 감정노동과 수면의 질에 대한 관련성을 탐색함으로써, 아파트 경비원의 수면의 질을 개선할 수 있는 중재 프로그램 개발의 기초자료를 제공하고자 한다.

2. 연구 목적

본 연구의 목적은 아파트 경비원의 피로도, 감정노동, 수면의 질 현황을 알아보고 피로도와 감정노동이 수면의 질에 미치는 영향 정도를 분석하는 것이다. 구체적인 목표로는 아파트 경비원의 인구사회학적 특성, 건강관련 특성, 근무관련 특성에 따른 수면의 질 차이를 파악하고, 아파트 경비원의 피로도, 감정노동과 수면의 질과의 상관관계를 확인하며, 피로도와 감정노동이 아파트 경비원의 수면의 질에 미치는 영향을 파악하는 것이다.

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연구방법

1. 연구 설계

본 연구는 아파트 경비원의 피로도, 감정노동과 수면의 질을 파악하고, 수면의 질에 미치는 영향요인을 규명하고자 시도된 서술적 조사연구이다.

2. 연구대상

본 연구는 2022년 7월~10월, 서울특별시를 비롯하여 3개 광역시(인천, 대전, 대구), 6개 도(충북, 충남, 전북, 강원, 경남, 경기)에 있는 아파트, 빌라, 맨션 등에서 경비원으로 근무하는 55세 이상[6] 남성을 대상으로 하였고, 학교, 빌딩, 병원, 상가건물 등의 경비원은 제외하였다. 본 연구에서는 연구의 목적을 이해하고 연구 참여에 자발적으로 동의한 대상자로 한정하여 편의 추출하였다. 본 연구의 표본크기는 G*Power 3.1.9.7. 프로그램을 사용하여 산출하였다. 교대근무자의 수면의 질에 대한 선행연구[3,4]를 참고하여 효과크기를 .15로 설정하였고, 유의수준 .05, 통계적 검정력 80%, 선행연구에서 교대근무자의 수면의 질에 영향을 미치는 요인으로 보고된 변수들[1,3,4,8], 경비근로자의 근무특성에 대한 변수들[10,20], 피로도와 감정노동을 포함하여 독립변수 총 20개로 하여 회귀분석에 필요한 표본크기는 157명이 산출되었다. 탈락률 20%를 고려하여 197명을 조사하였고, 불성실 응답 1명을 제외하여 총 196명을 최종 분석하였다.

3. 연구도구

1) 일반적 특성

아파트 경비원의 인구학적 특성(나이, 학력, 종교, 결혼상태, 동거가족 여부, 월평균임금, 주관적 경제상태), 건강관련 특성(음주, 흡연, 카페인 섭취량, 주관적 건강상태, 만성질환 유무, 신체활동량)과 근무관련 특성(아파트 경비원 총 근무기간, 근무형태, 주당 근무시간, 별도 휴게실 유무, 휴게시간보장 여부)을 조사하였다[1,3,4,8,14]. 주관적인 경제상태는 '매우 나쁘다', '나쁘다', '보통이다'는 '나쁨'으로, '좋다'와 '매우 좋다'는 '좋음'으로 구분하였다. 월평균 급여 수준은 2022년도 최저임금 약 192만원을 기준으로 구분하였다. 카페인 함유 섭취량은 커피, 녹차/홍차, 탄산음료, 에너지 음료의 1주일동안 섭취한 잔 수를 조사하여 각 음료에 함유된 카페인 함량을 기준으로 주당 카페인 섭취량을 산출하여 400mg 미만과 이상으로 구분하였다[21]. 주관적인 건강상태는 '매우 나쁘다', '나쁘다', '보통이다'는 '나쁨'으로, '좋다'와 '매우 좋다'는 좋음으로 구분하였다. 만성질환은 고혈압, 당뇨, 뇌졸중, 심장질환, 암 등의 질환이 있는 경우를 조사하였다. 신체활동은 국제신체활동설문(International Physical Activity Questionnaire, IPAQ)을 이용하여 조사하였다. 일주일동안 10분 이상 시행한 격렬한 활동, 중간정도 신체활동, 걷기를 일일 몇 시간, 며칠동안 하였는지와 앉아서 보낸 시간이 몇 시간인지 조사하여 IPAQ 점수 환산법에 근거하여 신체활동량을 Metabolic Equivalent Task (MET)-minutes 점수로 산출하였다. 신체활동량이 600MET/주 미만인 대상자는 비활동자로, 600MET/일 이상인 대상자는 활동자로 구분하였다[22]. 휴게시간 보장은 '휴게시간을 자유롭게 사용할 수 있습니까?'에 대해 '휴게시간에 근무지를 벗어날 수도 있고, 자유롭게 사용할 수 있다', '휴게시간에 근무지를 벗어날 수 없으나, 취침 등 원하는 대로 사용할 수 있다', '휴게시간에 근무지를 벗어날 수 없으며, 휴게시간 중 급한 일이 발생할 경우 대처해야 한다'로 구분하였다.

2) 피로도

피로도는 Satio [23]가 일본의 산업안전보건에 맞게 30개 문항으로 개발한 도구를 Kim & Park [16]이 한국의 민간경비원에게 맞게 16문항(4개 하위영역, 5점 Likert 척도)으로 수정한 도구를 Kim [24]이 11문항으로 수정·보완한 도구로 측정하였다. 본 도구는 신체적 부조화 4문항, 소진 3문항, 정신적 피로 2문항, 신경계 기능장애 2문항의 5점 Likert 척도로 구성되었으며, 하위영역별로 점수가 높을수록 피로도 정도가 높음을 의미한다. 도구의 신뢰도 Cronbach's α는 Kim [24]의 연구에서 각 하위 영역별로 신체적 부조화 .84, 소진 .81, 정신적 피로 .78, 신경계 기능장애 .62였고, 본 연구에서는 신체적 부조화 .83, 소진 .89, 정신적 피로 .78, 신경계 기능장애 .72였다.

3) 감정노동

감정노동은 Jang 등[25]이 한국의 조직문화와 서비스산업의 특수성을 반영하여 24개 문항으로 만든 '한국형 감정노동 평가도구(Korean emotional labor scale, K-ELS)'를 수정·보완하여, 11개 항목으로 만든 '한국형 감정노동 평가도구(Revised Korean emotional labor scale 11, K-ELSⓡ11)[18]' 로 측정하였다. 이 평가도구는 '감정규제' 2문항, '감정부조화' 3문항, '조직모니터링' 2문항, '감정노동 보호체계' 4문항의 4개 하위 영역 총 11개 문항, 4점 Likert 척도로 구성되었으며, 총점 44점으로 점수가 높을수록 감정노동의 정도가 높음을 의미한다. 도구 개발 당시 도구의 신뢰도 Cronbach's α는.79였으며, 본 연구에서는 .76이었다.

4) 수면의 질

아파트 경비원의 수면의 질은 아파트 경비원이 겪었던 지난 4주 동안의 일상적인 수면 습관을 말한다[26]. 아파트 경비원의 수면의 질은 Buysse 등[27]이 개발한 Pittsburgh Sleep Quality Index(PSQI)를 Sohn, Kim, Lee와 Cho [26]가 한국형으로 표준화하여 만든 '한국판 피처버그 수면의 질 지수(Pittsburgh Sleep Quality Index-Korean, PSQI-K)'로 측정하였다. 수면의 질은 수면의 질(1문항), 수면잠복기(2문항), 수면기간(1문항), 수면효율(2문항), 수면장애(9문항), 수면제사용(2문항), 주간기능장애(2문항)의 7개 영역 총 19문

항으로 구성되었다. 각 문항은 각 영역의 계산법에 의해 0~3점으로 점수화 하며 총 합산 점수는 21점으로 점수가 높을수록 수면의 질이 나쁘다는 것을 의미하며, PSQI가 6점 이상인 경우 수면 질 저하군(poor sleeper)으로 분류된다.

4. 자료수집

본 연구는 2022년 7월부터 10월까지 전국 10개 지역(서울특별시, 인천, 대전, 대구광역시, 충북, 충남, 전북, 강원, 경남, 경기)에 위치한 아파트를 연구자들이 직접 방문하여, 아파트 경비원에게 본 연구의 목적을 설명하고 자발적 연구참여를 위해 서면 동의를 받은 후 자료수집을 하였다. 스스로 설문지를 읽고 답하기를 원하는 대상자는 자기 기입식으로 조사하였고, 글을 읽기 어려워하는 대상자에는 설문내용을 읽어주고 답하는 형식으로 자료를 수집하였다. 설문 시간은 약 15~20분 정도가 걸렸으며, 설문지 작성 후 답례품을 제공하였다. 자기기입 설문조사가 어려운 대상자의 자료수집에 있어 조사자 간의 일치도를 높이기 위하여 참여 연구자들이 모여 설문조사 방법에 대해 2회에 걸쳐 합의하여 동일한 방식으로 설문조사가 이루어지도록 하였다.

5. 자료분석

수집된 자료는 SPSS/WIN Version 26.0을 이용하여 분석하였다. 아파트 경비원의 일반적 특성, 피로도, 감정노동, 수면의 질은 빈도와 백분율, 평균 표준편차로 분석하였다. 대상자의 특성에 따른 수면의 질의 차이는 Independent t-test, Mann-Whitney U test, one-way ANOVA로 분석하였으며, 사후 검증은 Scheff e 검증을 이용하였다. 피로도, 감정노동, 수면의 질과의 관계는 Pearson's correlation으로 분석하였고, 수면의 질에 미치는 영향 요인을 파악하기 위해 단계적 선택방법으로 multiple regression을 시행하였다.

6. 윤리적 고려

본 연구는 연구자가 속한 기관의 기관생명윤리위원회 승인(IRB No. 2022027931)을 받아 수행하였다. 대면 설문조사 시작 전 연구대상자에게 본 연구의 목적과 조사방법 등을 설명하고, 수집된 자료는 연구 목적 이외에 사용되지 않을 것과 비밀유지와 익명성 보장에 대해 안내하였다. 연구 참여의 자발성과 참여 도중 연구 철회가 가능하고, 참여 거부 시 불이익이 없음을 명시하였다. 또한, 연구 대상자가 설문에 대한 안내 사항을 이해하고, 자발적으로 동의한 경우에만 참여하도록 하였다. 각각의 설문지에 고유번호(ID number)를 부여한 후 수집된 자료를 컴퓨터에 암호화하여 관리하였고, 연구 관련 자료는 잠금 장치가 달린 서류함에 3년간 보관 후 폐기할 예정이다.

연구결과

1. 대상자의 피로도, 감정노동과 수면의 질

대상자는 총 196명의 남성으로, 피로도의 각 하위영역별 평균점수는 신체적 부조화 2.17(±0.78)점, 소진 1.95(±0.73)점, 정신적 피로 2.01(±0.74)점, 신경계 기능장애 1.80(±0.71)점으로, 신체적 부조화 피로도가 가장 높았고, 신경계 기능장애 피로도가 가장 낮았다. 감정노동의 총점 평균점수는 25.87(±4.46)점이었고, 수면의 질 총점 평균점수는 8.82(±2.15)점이었으며, 수면 질 저하군은 183명(93.4%)이었다 (Table 1).

2. 인구학적, 건강관련 특성과 그에 따른 수면의 질 차이

대상자의 평균 나이는 66.65(±4.92)세로 65~69세가 72명(36.7%)으로 가장 많았다. 학력은 고졸 이상이 134명(68.4%), 결혼상태는 기혼이 161명(82.1%), 종교가 있는 경우는 107명(54.6%), 동거 가족이 있는 경우는 174명(88.8%)이었다. 주관적 경제상태가 좋은 경우는 163명(83.2%), 월평균 임금은 220.88(±29.43)만원이었고, 192만원 이상이라고 응답한 경우는 182명(92.9%)이었다. 대상자의 일반적 특성 중 주관적 경제 상태에 따라서만 수면의 질이 통계적으로 유의한 차이를 보였고(t=3.00, p=.003), 그 외 특성에 따라서는 수면의 질은 차이를 보이지 않았다.

대상자의 건강 관련 특성을 보면, 음주를 하는 경우가 126명

Table 1. Descriptive Statistics of Fatigue, Emotional Labor, Sleep Quality (N=196)

Variables	Min	Max	n(%) or M±SD (Total Score)	M±SD (Average Score)	Range
Fatigue					
Physical imbalance	4	16	8.67±3.14	2.17±0.78	4~20
Exhaustion	3	12	5.86±2.19	1.95±0.73	3~15
Mental Fatigue	2	8	4.01±1.48	2.01±0.74	2~10
Nervous System Disfunction	2	8	3.59±1.43	1.80±0.71	2~10
Emotional Labor	15	43	25.87±4.46	2.35±0.41	11~44
Sleep Quality	4	15	8.82±2.15		0~21
Good sleeper (0~5)			13(6.6)		
Poor sleeper (≥6)			183(93.4)		

(64.3%), 비흡연자가 140명(71.4%), 주당 카페인 섭취량아 400mg을 넘는 경우는 5명(2.6%)이었고, 만성질환이 있는 경우는 128명(65.3%)이었으며, 신체활동량이 600MET 이상인 대상자는 43명(21.9%)이었다. 대상자의 수면의 질은 주관적 건강상태(t=3.64, p<.001)와 만성질환 여부(t=-2.88, p=.004)에 따라서 통계적으로 유의한 차이를 보였다(Table 2).

3. 대상자의 근무관련 특성과 그에 따른 수면의 질 차이

대상자의 근무 관련 특성을 살펴보면, 아파트 경비원의 총 근무기간은 평균 5.07(±4.44)년이었고 5년 미만 근무자는 116명(59.2%)이었다. 근무 형태는 24시간 격일제 근무가 185명(94.4%)으로 대부분이었고, 주당 평균 근로시간이 76.49시간이었다. 별도의 휴게실이 없는 경우는 135명(68.9%), 휴게시간보장에서는 휴게시간 동안 근무지 이탈이 안되고 휴게시간 중 급한 일이 생기면 대처해야 하는 경우가 111명(56.6%)으로 과반수가 넘었다. 근무특성 중 휴게시간보장(F=3.56, p=.030)에 따라서만 수면의 질은 통계적으로 유의한 차이를 보였다(Table 3).

4. 피로도, 감정노동, 수면의 질의 상관관계

수면의 질은 피로도의 4개 하위영역인 신체적 부조화(r=.36, p<.001), 소진(r=.41, p<.001), 정신적 피로(r=.30, p<.001), 신경계 기능장애(r=.29, p<.001)와 감정노동(r=.39, p<.001)과 모두 통계적으로 유의한 양의 상관관계를 보였다(Table 4).

Table 2. Demographic and Health-related characteristics and Sleep Quality by Demographic and Health-related characteristics (N=196)

Variables	Categories	n(%) or M±SD	Sleep quality	
			M±SD	t/F/Z(p)
Demographic characteristics				
Age	<65	64(32.7)	9.05±2.16	0.72(.488)
	65≤ ~ <70	72(36.7)	8.81±2.27	
	≥70	60(30.6)	8.58±1.99	
		66.65±4.92		
Education	< High school	62(31.6)	8.53±2.12	-1.26(.209)
	≥ High school	134(68.4)	8.95±2.16	
Marital status	Married	161(82.1)	8.72±2.14	-1.34(.181)
	Others	35(17.9)	9.26±2.19	
Religion	No	89(45.4)	9.08±2.27	1.56(.120)
	Yes	107(54.6)	8.60±2.03	
Family type	alone	22(11.2)	9.14±2.40	0.74(.460)
	with family	174(88.8)	8.78±2.12	
Subjective economic status	Bad	33(16.8)	9.82±2.46	3.00(.003)
	Good	163(83.2)	8.61±2.03	
Monthly average wage (10,000 KRW)	<192	14(7.1)	8.93±2.17	0.20(.840)
	≥192	182(92.9)	8.81±2.16	
		220.88±29.43		
Health-related characteristics				
Alcohol	No	70(35.7)	8.44±2.29	-1.82(.070)
	Yes	126(64.3)	9.02±2.05	
Smoking	No	140(71.4)	8.65±2.22	-1.72(.087)
	Yes	56(28.6)	9.23±1.92	
Caffeine intake(day)	<400mg	191(97.4)	8.77±2.12	-1.30(.193)*
	≥400mg	5(2.6)	10.40±2.97	
Self-related health status	Bad	108(55.1)	9.31±2.11	3.64(<.001)
	Good	88(44.9)	8.22±2.06	
Comorbidity	None	68(34.7)	8.22±1.91	-2.88(.004)
	Haven	128(65.3)	9.13±2.21	
Physical activity	Inactive (<600 MET)	153(78.1)	8.78±2.16	-0.39(.695)
	Active (≥ 600MET)	43(21.9)	8.93±2.12	

*Mann-Whitney U test

Table 3. Work-related Characteristics and Sleep Quality by Work-related Characteristics (*N*=196)

Variables	Categories	n(%) or M ± SD	Sleep quality	
			M ± SD	t/F(*p*)
Total duration of service as apartment guards (years)	< 5	116 (59.2)	8.92 ± 2.06	0.83 (.407)
	≥ 5	80 (40.8)	8.66 ± 2.28	
		5.07 ± 4.44		
Shift system	24-hour shifts	185 (94.4)	8.75 ± 2.11	-1.74 (.083)
	Others (12-hour shifts, only daytime work etc.)	11 (5.6)	9.91 ± 2.66	
Actual hours worked (per week)		76.49 ± 12.22		
Separate break room	No	135 (68.9)	8.93 ± 2.03	1.06 (.290)
	Yes	61 (31.1)	8.57 ± 2.40	
Rest time guaranteed	Can leave working area & use rest time freely[a]	33 (16.8)	7.97 ± 1.93	3.56 (.030) (a < c)[†]
	Can't leave working area, but possible free napping etc.[b]	52 (26.5)	8.77 ± 1.93	
	Can't leave working area & need to cope in a hurry[c]	111 (56.6)	9.09 ± 2.26	

[†]Scheffé's test.

Table 4. Correlations of Fatigue, Emotional Labor, and Sleep Quality among participants (*N*=196)

Variables		Fatigue				Emotional Labor	Sleep quality
		Physical Imbalance	Exhaustion	Mental Fatigue	Nervous System Dysfunction		
		r (*p*)	r (*p*)	r (*p*)	r (*p*)	r (*p*)	r (*p*)
Fatigue	Physical imbalance	1					
	Exhaustion	.80 (< .001)	1				
	Mental Fatigue	.71 (< .001)	.71 (< .001)	1			
	Nervous System Dysfunction	.75 (< .001)	.64 (< .001)	.63 (< .001)	1		
Emotional Labor		.38 (< .001)	.39 (< .001)	.27 (< .001)	.23 (.001)	1	
Sleep quality		.36 (< .001)	.41 (< .001)	.30 (< .001)	.29 (< .001)	.39 (< .001)	1

Table 5. Factors affecting Sleep Quality of Participants (*N*=196)

Variables	B	S.E.	β	t	*p*
(Constant)	3.67	0.79		4.63	< .001
Exhaustion Fatigue	0.27	0.07	.28	4.11	< .001
Emotional Labor	0.13	0.03	.27	4.02	< .001
Subjective economic status (bad)[†]	0.85	0.36	.15	2.34	.020
$F = 21.56, p < .001, R^2 = .25 (_{Adj}R^2 = .24)$					

[†]Subjective economic status (reference: good)

5. 수면의 질에 영향을 미치는 요인

대상자의 수면의 질에 영향을 미치는 요인을 파악하기 위해 다중 회귀분석을 하였다. 단변량 분석에서 수면의 질과 관련성을 보인 주관적 경제 상태, 만성질환 여부, 주관적 건강 상태, 휴게시간보장 여부, 피로도(신체적 부조화, 소진, 정신적 피로, 신경계 기능장애)와 감정노동을 '단계 선택법'으로 투입하였다. 이 중 범주형 변수인 주관적 경제 상태, 만성질환 여부, 주관적 건강 상태, 휴게시간보장 여부는 가변수(dummy variable)로 처리하여 분석하였다.

수면의 질에 대한 회귀모형은 유의하였으며($F = 21.56$, $p < .001$), 소진 피로도($\beta = .28$, $p < .001$)가 수면의 질에 가장 많은 영향을 주었고, 감정노동($\beta = .27$, $p < .001$), 나쁜 주관적 경제상태($\beta = .15$, $p = .020$)순으로 수면의 질에 영향을 주는 것으로 나타났다. 즉, 감정노동 수준과 소진 피로도가 높으며 주관적 경제수준이 낮은 대상자에서 수면의 질이 낮았다. 본 회귀모형의 설명력은 24.0%였다 (Table 5).

본 회귀 모형의 적합도를 보면, 다중 공선성 검증을 위해 살펴본

공차 한계(tolerance)는 .84~.98로 0.1 이상이었으며, 분산팽창지수(VIF)는 1.02~1.19로 10보다 작았다. 상태지수는 1.00~15.05으로 30보다 작아 상호 독립적이었다. 마지막으로 모형의 잔차정규성을 검정한 결과 Durbin-Waston 값이 2.05으로 잔차의 자기상관성은 없었으며, Shapiro-Wilk 검정을 통한 잔차의 정규성 검정에서 p=.625로 잔차의 정규성을 만족하여 본 회귀 모형이 타당한 것으로 확인하였다.

논의

본 연구에서 아파트 경비원의 수면의 질 평균점수는 8.82점으로, 같은 도구로 측정한 교대근무 간호사의 7.31점[4], 제조업 남성근로자의 4.18점[2], 60세 이상 지역사회 거주 노인의 6.3점[28], 65세 이상 지역사회 거주 노인의 7.08점[29] 보다 높아 아파트 경비원의 수면의 질이 타 직종과 지역사회 거주 노인보다 더 낮았다. 이러한 결과는 연령보다는 격일제 근무로 인해 주당 근무시간(평균 76.49시간)이 긴 아파트 경비원의 근무 형태와 관련된 것으로 생각된다. 주당 근무시간이 길면 수면의 질이 낮아지므로[1], 장시간 근무하는 아파트 경비원의 수면의 질에 영향을 주는 요인을 고려한 다양한 중재 방안의 마련 및 적용이 요구된다.

본 연구에서 아파트 경비원의 수면의 질에 영향을 미치는 요인은 소진 피로도, 감정노동, 주관적 경제상태였다. 즉, 소진 피로도와 감정노동 수준이 높고, 주관적 경제수준이 낮은 경우 수면의 질이 감소하였다. 이는 교대근무자들에게 있어 수면의 질 관련 요인으로 보고된 감정노동[3]과 피로도[3,4], 전기노인(65~74세)에게서 보고된 경제수준[14]과 유사한 결과이다. 이 중 소진 피로도가 수면의 질에 가장 유의한 영향 요인이었으므로, 소진 피로도 수준을 확인하고 이를 낮추는 방안을 마련하는 것이 무엇보다 필요하다.

본 연구에서 아파트 경비원의 소진 피로도는 평균 1.95점으로, 사설 보안업체에 근무하는 보안요원의 소진 피로도 2.25~2.48점보다 다소 낮았다[24]. 이는 연령과 업무 특성에서 일부 기인한 결과로, 본 연구 대상자가 20~30대가 97.1%였던 Kim [24]의 연구 대상자보다 고령이며, 보안업체 근무자가 아닌 아파트 경비원이었기 때문인 것으로 보인다. 경비노동자는 직무 수행 중 받는 스트레스를 잘 관리하지 못한 상태로 지속적으로 스트레스에 노출되었을 때 소진을 경험하게 된다[30]. 또한, 아파트 경비원에서 감정노동은 직무 소진에 부정적인 영향을 미치는데[31], 이는 본 연구에서 감정노동이 증가할수록 소진 피로도 또한 증가한 결과와 일치하였다. 이에, 아파트 경비원에서 소진으로 인한 수면의 질 저하를 막기 위해서는 감정노동과 스트레스의 감소 및 관리가 필요하다. 이를 위해 아파트 경비원이 스스로를 격려하고, 일과 자신을 분리하는 감정적 격리방법을 습득하며, 분노조절 훈련과 효율적인 의사소통을 통한 자기 표현 기법을 익히고, 이완요법 등을 적용할 수 있도록 교육해야 한다[9,25].

소진을 제외한 피로도 또한 수면의 질과 유의한 양의 상관관계가 있어 신체적 부조화, 정신적 피로, 신경계 기능장애에 대한 관리도 요구된다. 본 연구 대상자의 신체적 부조화는 2.17점, 정신적 피로 2.01점, 신경계 기능장애 1.80점으로, 같은 도구를 사용한 Kim [24]의 신체적 부조화 2.53점, 정신적 피로 2.29점, 신경계 기능장애 1.88점보다 각각 낮았다. 신체적 부조화 피로는 두통, 어깨의 뻣뻣함, 허리 통증 등의 증상을 포함한다[16]. 오랜 시간 앉아 있기 등의 불편한 근무 자세에 노출되는 빈도가 높을수록 두통으로 인한 피로도가 높아지는데[32], 이러한 두통은 수면을 방해한다[33]. 또한 어깨관절 통증은 야간에 통증을 유발하여 수면유도나 유지가 어렵고 수면 중 체위 변경 시마다 통증을 느낄 수 있어 수면장애로 이어진다[33]. 더불어 대부분 좁은 경비초소에서 장시간 앉아서 근무를 하고 수면까지 해결하는 아파트 경비원의 근무환경조건이 신체적 부조화 피로를 초래하여 아파트 경비원의 수면의 질에 부정적인 영향을 주는 것으로 보인다. 스트레스와 불안에 장시간 노출되어 뇌가 과도하게 활동한 상태인 정신적 피로 또한 수면의 질을 낮추므로[34,35] 스트레스 감소를 통한 정신적 피로 감소를 완화시켜야 하겠다. 수면과 자율신경계는 해부학적, 생리학적 및 신경화학적으로 밀접한 관련이 있어, 자율신경계가 수면 촉진 뉴런과 NREM(non-rapid eye movement), REM(rapid eye movement) 수면 주기 등을 제어하는데[36], 자율신경계의 신경학적 이상이 생기면 수면 시간 동안 흥분 또는 불안하게 되어 수면이 방해된다[37]. 이러한 이유로 인해 신경계 기능장애 피로가 높은 경우 수면의 질이 낮아지는 것으로 보인다. 이렇듯 피로는 여러 하위 영역으로 구분하면서 정신적, 육체적으로 나눌 수 있지만[16] 대부분 신체적, 정신적인 피로가 동시에 발생하므로[38], 아파트 경비원의 수면의 질을 향상시키기 위해서는 정신적, 육체적 피로도 모두를 줄이기 위해 노력해야 한다.

피로는 교대근무로 인해 일주기리듬(circadian rhythm)이 교란되고 불규칙적인 수면-기상 순환(sleep-wake cycle)의 방해로 증가하여 수면 손실로 이어진다[15]. 경비원의 근무시간이 많을수록(50시간 이상) 피로도가 높은데[16], 본 연구에서 아파트 경비원의 실제 주당 근무시간이 평균 76.49시간으로, 주 5일 근무(하루 8시간) 기준 40시간을 크게 초과하고 있었으므로, 아파트 경비원의 피로도 감소를 위해 적정 근무시간만큼 일 할 수 있는 근무 체계 개선이 요구된다. 무엇보다 수면의 질을 높이기 위해 교대근무자의 피로를 완화시키는 구체적인 중재로 계획된 사이잠(napping)의 중요성이 강조되고 있다[17,39]. 24시간 교대근무를 하는 아파트 경비원의 경우 휴게시간에 30분 이하의 사이잠을 자는 것이 주관적인 피로감을 줄이고 성과, 경각심, 기분을 향상시키므로[17,39], 사이잠을 잘 수 있도록 별도의 휴게시설 마련과 근무 형태 개선이 필요하다. 또한, 아파트 경비원 개인도 피로 완화를 위해서 균형 잡힌 식사를 하고, 피로회복을 위해 쉬는 날에는 충분한 수면을 취하고, 매일 규칙적이고 적절한 양의 운동을 해야 한다[39]. 또한, 50세 이상의 경우

비타민(B_{12}, D), 철분, 엽산 등의 부족, 빈혈 등과 관련해서도 피로를 느낄 수 있기 때문에[40] 충분한 영양섭취도 필요하다.

아파트 경비원의 수면의 질을 개선하기 위해서는 감정노동 또한 감소되어야 한다. 본 연구에서 아파트 경비원의 감정노동 평균점수는 25.87점(100점 만점에 59점)으로, 간호사의 감정노동 환산점수 67점[3], 2012년에 한국직업능력개발원에서 조사한 관리직, 연구직, 경찰 및 소방공무원, 운송업 등 다양한 직업군의 환산점수 63.3~82.5점보다 낮았다[41]. 이는 직종 및 연구 시기의 차이에서 일부 기인한 결과로 보인다. 감정노동은 불면증, 수면방해 등 수면의 질에 부정적인 영향을 준다[5]. 이는 감정억제 스트레스 상황에 노출되면 신경내분비계의 HPA (hypothalamic-pituitary-adrenal) axis와 교감신경계를 포함하는 뇌의 스트레스 시스템이 과도하게 활성화되어[5], 직무스트레스가 증가하고, 불안과 우울증을 유발하여 수면의 질을 악화[5,8]시키기 때문이다. 이를 개선하기 위해 경비 업무 이외에 가능한 공동주택관리 업무를 명확히 하고자 일명 '경비원갑질금지법'으로 '공동주택관리법령'(2021.10)이 개정·시행되고 있다[42]. 이와 더불어 아파트 경비원의 감정노동을 관리하기 위해서는 아파트 관리소와 입주민들의 경비업무 전문성에 대한 존중과 인식 개선[11], 입주민의 민원과 무리한 요구에 대한 응대 매뉴얼의 마련과 이에 대한 교육 및 훈련이 필요하다. 아울러, 필요시 전문상담을 받을 수 있고 체계적인 감정노동 완화방법을 교육을 받을 수 있는 시스템도 구축되어야 하겠다.

다음으로 주관적으로 인식하는 경제상태가 나쁜 경우에도 아파트 경비원의 수면의 질이 낮았다. 이는 경제수준이 높을수록 전기 노인의 수면의 질이 좋았던[14] 연구와 유사한 결과이다. 따라서 주관적 경제수준이 낮은 대상자를 중심으로 수면의 질에 부정적인 영향을 미치는 소진 피로도와 감정노동을 완화시키기 위한 중재를 제공하고, 질 좋은 수면을 촉진하는 요인을 강화하기 위한 건강교육도 제공하여야 한다.

또한, 본 연구에서 수면의 질에 차이를 보인 요인은 휴게시간 보장 상태, 주관적 건강상태와 만성질환 여부였다. 아파트 경비원이 휴게시간에 근무지 이탈이 불가능하고, 긴급상황 시 대처가 필요한 경우 수면의 질이 나빴다. 아파트 경비원의 야간근무 중 휴게시간이 있는 경우 수면장애의 위험이 낮으므로[8], 경비근로자들의 수면의 질을 개선하기 위해 법적으로 보장된 휴게시간을 방해없이 사용하는 것이 중요하다[10]. 근로기준법 제54조(휴게시간)에 의하면 근무지 이탈이 가능하고 자유롭게 사용할 수 있어야 하지만, 본 연구 및 선행연구[10,20]의 결과처럼 아파트 경비원 대다수가 휴게시간에 근무지를 벗어날 수 없거나 비상시에 대응해야 하고, 별도의 휴게공간도 없어 경비초소에서 쉬는 것이 대부분이다. 특히, 아파트 경비원은 근로기준법 적용 예외 직군에 속하여 근로, 휴게 및 휴일 등의 적용을 받지 못하여 근로시간에 대한 상한이 없으며 휴게시간도 보장되지 않아 실제적인 휴게시간을 온전히 가지지 못하는 실정이다[10]. 따라서, 아파트 경비원의 수면의 질을 높이기 위해서는 법적으로 정해진 휴게시간이 보장되어야 한다[10,39]. 이를 위해 아파트 엘리베이터나 현관에 휴게시간 보장에 대한 게시물을 부착하여 입주민들이 아파트 경비원들의 정해진 휴게시간 및 수면시간을 인지하여 방해하지 않도록 하고[10], 아파트 관리사무소도 법정 휴게시간을 보장해야 한다.

한편, 만성질환이 있는 대상자에서 수면의 질의 낮았는데, 이는 만성폐질환, 골관절염 등의 만성질환을 가진 대상자[43], 노인[14], 중국의 은퇴자[44]에서 만성질환이 있을 때 수면의 질이 좋지 않았던 결과와 유사하였다. 만성질환은 질병 그 자체로 인한 통증 및 불편감으로 인해 수면패턴에도 영향을 준다. 또한 이를 관리하기 위해 복용하는 약물 중 일부는 수면의 질을 떨어뜨리는 원인이 되기도 한다[45]. 이에, 아파트 경비원들이 만성질환에 대한 자가간호를 잘 수행할 수 있도록 이에 대한 간호중재가 제공되어야 하겠다.

또한, 주관적 건강상태가 좋지 않은 대상자도 수면의 질이 낮았다. 이는 20~50세 남성 소방직 공무원과 제조업 남성 근로자들을 대상으로 한 연구 결과와 유사하였다[46,47]. 신체건강과 수면시간과 수면의 질은 관련성이 있고[48] 적당한 수면, 운동 및 식이는 신체적 건강과 활력을 되찾아 주기 때문에 주관적 건강상태에 긍정적 영향을 미치므로[48], 건강한 생활습관을 통해 수면의 질을 높여야 한다. 특히, 규칙적인 운동은 멜라토닌 내인성 농도에 영향을 주고 뇌에서 내인성 오피오이드펩티드의 분비를 증가시켜 수면의 질을 향상시키므로[45], 규칙적인 운동 실천에 대한 교육이 필요하다. 그렇지만, 24시간 교대근무로 인해 운동이 어려운 경우 아파트 단지 내 산책이나 커뮤니티 내 운동시설을 이용할 수 있도록 배려할 필요가 있겠다. 한편, 본 연구에서 건강상태가 나쁘다고 한 대상자는 55.1%로, 2020년 노인실태 조사에서 보고된 65세 이상 지역사회 거주 노인 50.1%[49]보다는 높았으나 서울 및 경기에 거주하고 보건소를 이용하는 65세 이상 노인의 66.5%[50]보다는 낮았다. 이러한 결과는 만성질환 이환 여부 등과 관련되어 차이를 보이는 것으로 생각된다. 이에, 만성질환을 가진 아파트 경비원의 경우 적극적인 만성질환 관리 등을 통하여 주관적 건강상태를 높이는 것이 필요하겠다.

본 연구는 편의 추출로 인한 편향을 배제하고자 전국 10개 지역에서 자료를 수집하였으나 아파트 경비원 전체로 일반화하는 것에는 제한이 있다. 아울러, 본 연구에서 제시한 수면의 질 회귀모형의 설명력이 24%로 높지 않아 아파트 경비원의 수면의 질에 영향을 미치는 물리적 환경을 포함한 다양한 요인에 대한 추후 연구가 필요함을 확인하였다. 그렇지만, 아파트 경비원의 수면의 질 향상을 위해 적정 근로시간 및 휴게시간 보장 등의 정책적 제안과 더불어 피로, 감정노동 및 스트레스 완화를 위한 통합적 수면건강증진 간호중재 프로그램의 개발과 적용, 효율적인 만성질환 관리를 통한 주관적인 건강상태 증진을 위한 간호제공의 필요성을 확인한 면에서 본 연구에 의의가 있다고 하겠다.

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결론

본 연구 결과 아파트 경비원의 수면의 질은 낮았고, 경제적 상태가 좋지 않고 피로 소진과 감정노동이 크면 수면의 질이 낮아지므로, 소진 피로 및 감정노동을 감소시킬 수 있는 효과적인 스트레스 관리와 더불어 규칙적인 운동, 균형 잡힌 식이 등의 바람직한 건강행위 실천을 통한 수면의 질 개선을 위한 수면건강 교육 등의 간호중재가 필요하다.

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Conflict of interest

The authors declared no conflict of interest.

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Authors' contributions

Kim, Chul-Gyu contributed to conceptualization, data curation, formal analysis, methodology, writing – original draft, review & editing, supervision, and validation. Jeong, Sujeong contributed to data curation, formal analysis, methodology, and writing – original draft, review & editing. Ryu, Young Mi contributed to writing – review & editing, and validation. Park, Seungmi contributed to conceptualization, data curation, methodology, writing – original draft, review & editing, supervision, and validation. Moon, Kyoungmi contributed to data curation, methodology, and writing – original draft, review & editing. Park, Sun-A contributed to data curation, and writing – original draft, review & editing. Park, Hye Ok contributed to conceptualization, data curation, formal analysis, methodology, writing – original draft, review & editing, and validation.

Data availability

Please contact the corresponding author for data availability.

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References

1. Han SM. Effects of work hours and night duty on sleep disturbance in Korean workers. Culture and Convergence. 2022;44(12):1277-1287. https://doi.org/10.33645/cnc.2022.12.44.12.1277
2. Kim KW, Chung EK, Park HD, Kim KB, Kang JH, Ro JW, et al. Differences in sleep quality and fatigue according to gender of shift workers in electronics manufacturing industries. Journal of Korean Society of Occupational and Environmental Hygiene. 2017;27(2):138-148. https://doi.org/10.15269/JKSOEH.2017.27.2.138
3. Choi JY, Kim HY. Influence of emotional labor and fatigue on sleep quality of nurses under COVID-19. Journal of the Korea Academia-Industrial Cooperation Society. 2022;23(5):52-60. https://doi.org/10.5762/KAIS.2022.23.5.52
4. Seol MJ, Lee BS, Lee SK. Effects of labor intensity and fatigue on sleep quality of clinical nurses. Journal of Korean Academy of Nursing Administration. 2018;24(4):276-287. https://doi.org/10.11111/jkana.2018.24.4.276
5. Kang DK, Yang JW, Choi WJ, Ham SH, Kang SK, Lee WH. Anxiety, depression and sleep disturbance among customer-facing workers. Journal of Korean Medical Science. 2019;34(48):1-14. https://doi.org/10.3346/jkms.2019.34.e313
6. Hong KP, Oh KC, Lee CB. A study of elderly private security guards about their victimization experience in the workplace and their perception of occupational stress. Koreans Security Journal. 2013;(36):469-492.
7. Kim HY, Yoo HS. A phenomenological study on emotional labor experienced by middle-aged male apartment security guards. The Journal of Humanities and Social Science. 2022;13(6):1469-1484. https://doi.org/10.22143/HSS21.13.6.100
8. Lee JH, Chang TW, Chae HJ, Kim HL, Yoon JH, Kang MY, et al. Sleep disorder status and management measures of night workers. Research Report. Ulsan: Korea Occupational Safety

and Health Agency. 2017 November. Report No: 2017-Researcher-1075.
9. Korea Occupational Safety and Health Agency. Occupational Health Guidelines for Apartment Security Guard [Internet] Ulsan: Korea Occupational Safety and Health Agency. 2016 [cited 2022 Dec 12]. Available from: https://www.kosha.or.kr/kosha/data/healthPromotionMediaData.do?mode=view&articleNo=241343&attachNo=
10. National Apartment Security Workers Survey Report [Internet]. Seoul: Korean Contingent Workers' Center. 2019 [cited 2022 Dec 12]. Available from: http://www.workingvoice.net/xe/index.php?mid=policy_report&document_srl=301750
11. Police Agency Security Status [Internet]. Ministry of the Interior and Safety. c2020 - [cited 2023 Feb 22]. Available from: https://www.data.go.kr/data/3072328/fileData.do#layer_data_infomation
12. Park GW, Goh SJ, Kim DH, Kim HL, Park JK, Yu SY, et al. Effects of sleep quality and occupational stress on health-related quality of life among a university's security workers. Korean Journal of Health Education and Promotion. 2015;32(3):73-83. http://doi.org/10.14367/kjhep.2015.32.3.73
13. Kim JW, Kim YG, Jeon DJ. A study on the real circumstance and the treatment improvement for the apartment guard labors. The Journal of Incheon Studies. 2017;1(26):309-329. http://doi.org/10.46331/jis.2017.02.26.309
14. Seo YM, Kim JS, Je NJ. Factors relating quality of sleep: Comparison between young-old people and old-old people. Journal of the Korea Academia-Industrial Cooperation Society. 2019;20(6):332-341. https://doi.org/10.5762/KAIS.2019.20.6.332
15. Steele TA, St Louis EK, Videnovic A, Auger RR. Circadian rhythm sleep-wake disorders: A contemporary review of neurobiology, treatment, and dysregulation in neurodegenerative disease. Neurotherapeutics : The Journal of the American Society for Experimental Neuro Therapeutics. 2021;18(1):53-74. https://doi.org/10.1007/s13311-021-01031-8
16. Kim KS, Park YM. Development of fatigue scale of private security guards. The Journal of the Korea Contents Association. 2014;14(11):175-185. http://doi.org/10.5392/JKCA.2014.14.11.175
17. Barger LK, Runyon MS, Renn ML, Moore CG, Weiss PM, Condle JP, et al. Effect of fatigue training on safety, fatigue, and sleep in emergency medical services personnel and other shift workers: A systematic review and meta-analysis. Prehospital Emergency Care. 2018;22(sup1):58-68. http://doi.org/10.1080/10903127.2017.1362087
18. Jang SJ, Kang HT, Go SB, Kim IA, Kim HR, Oh SS, et al. Improvement of stress assessment tools and preparation of utilization plans for emotional labor workers. Research Paper. Ulsan: Korea Occupational Safety and Health Agency. 2018 October. Report No. 2018-Researcher-790.
19. Yoo YK. Promotion of applying for industrial accidents of security guards who sacrificed "resident power abuse"...A similar case six years ago. SBS News [Internet]. 2020 May 18 [cited 2022 Apr 8]. Available from: https://news.sbs.co.kr/news/endPage.do?news_id=N1005792800
20. Lee SP, Ha TH. Chungcheongnam-do Apartment Security Workers Survey Report [Internet]. Chungcheongnam-do: Chungcheongnam-do Labor Rights Center. 2020 [cited 2023 Mar 4]. Available from: http://www.cnnodong.net/front/publication/view.do?bIdx=545&pageIndex=2&searchCate=B04_2
21. Kim JY, Shin KJ, Kim HS. Science scent lemon balm [Internet]. Daejeon: Korea Advanced Institute of Science and Technology. 2013 [cited 2023 Jan 30]. Available from: https://repository.kisti.re.kr/handle/10580/7729
22. IPAQ Research Committee. Guidelines for data processing and analysis of the International Physical Activity Questionnaire (IPAQ) - Short and Long Forms [Internet]. IPAQ Research Committee. 2005 November [cited 2023 June 30]. Available from: http://www.ipaq.ki.se/scoring.pdf
23. Saito K. Measurement of fatigue in industries. Industrial Health. 1999;37(2):134-142. https://doi.org/10.2486/indhealth.37.134
24. Kim EY. The effects of emotional labor on fatigue scale of private security guards in regular exercise. Korea Security Journal. 2020;(62):205-222. https://doi.org/10.36623/KSSR.2020.62.9
25. Jan SJ, Kang HT, Kim SY, Kim IA, Kim JI, Kim HL, et al. Korean Emotional Labor and Violence (2013 Research) Research on the application of research tools. Research Report. Ulsan: Korea Occupational Safety and Health Agency; 2014, October. Report No.: 2014-Reseracher-810.
26. Sohn SI, Kim DH, Lee MY, Cho YW. The reliability and validity of the Korean version of the Pittsburgh Sleep Quality Index. Sleep and Breathing. 2012;16(3):803-812. https://doi.org/10.1007/s11325-011-0579-9
27. Buysse DJ, Reynolds III CF, Monk TH, Berman SR, Kupfer DJ.

The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. Psychiatry Research. 1989;28(2):193-213. https://doi.org/10.1016/0165-1781(89)90047-4

28. Oh YK, Kim BJ, Park CS, Lee CS, Cha BS, Lee SJ, et al. A study on the relationship between sleep quality and cognitive function in community elderly. Sleep Medicine and Psychophysiology [Internet]. 2020 Jun 30;27(1):16-23. Available from: https://doi.org/10.14401/KASMED.2020.27.1.16
29. Nam E, Park JK. The effects of chronic diseases, sleep and serotonin concentration on depression among elderly people living in the community. Journal of Korean Academy of Community Health Nursing. Korean Academy of Community Health Nursing. 2020;31(4):472-480. http://dx.doi.org/10.12799/jkachn.2020.31.4.472
30. Park YM, Ha JH. The Relationship between emotional labor in security agents and job stress and burnout. Journal of the Korean Society of Private Security. 2014;13(3):189-220.
31. Cho CK, Choi DJ, Park SH. The influence of apartment guards' emotional labor on job stress and job burnout. The Journal of Humanities and Social Science. 2015;6(4):893-910.
32. Kim YH, Koh SJ, Cho KM, Chae JK, Oh HJ, Chang SJ. Effects of working postures on headache/eye strain in Korean waged workers: The 5th working condition survey(2017). Journal of Korean Society of Occupational and Environmental Hygiene. 2022;32(2):116-128. https://doi.org/10.15269/JKSOEH.2022.32.2.116
33. Park SY, Choi TS, Kim DH, Ryu BH, Lee SB. Correlation between neck and shoulder pain, neck and shoulder disability, headache and smartphone addiction in adults with sleep disorders. Journal of the Korean Society of Physical Medicine. 2020;15(3):43-50. https://doi.org/10.13066/kspm.2020.15.3.43
34. Mooditude. 7 Warning Signs of Mental Fatigue or Exhaustion and How to Overcome It [Internet]. MOODITUDE. 2023 [cited 2023 Apr 15]. Available from: https://mooditude.app/post/mental-fatigue-and-how-to-overcome-it/
35. Mozuraityte K, Stanyte A, Fineberg NA, Serretti A, Gecaite-Stonciene J, Burkauskas J. Mental fatigue in individuals with psychiatric disorders: A scoping review. International Journal of Psychiatry in Clinical Practice. 2023;27(2):186-195. https://doi.org/10.1080/13651501.2022.2129069
36. Cortelli P, Lombardi C. Chapter 29 sleep and autonomic nervous system dysfunction. Handbook of Clinical Neurophysiology. 2005;(6):343-353. https://doi.org/10.1016/S1567-4231(09)70054-1
37. Levin MC. Brain, spinal cord and neurological disorders symptom guide [Internet]. MSD MANUAL for the general public. 2023 [cited 2023 Aug 8]. Available from: https://www.msdmanuals.com/ko-kr/%ED%99%88/%EB%87%8C,-%EC%B2%99%EC%88%98,-%EC%8B%A0%EA%B2%BD-%EC%9E%A5%EC%95%A0/%EB%87%8C-%EC%B2%99%EC%88%98-%EB%B0%8F-%EC%8B%A0%EA%B2%BD-%EC%9E%A5%EC%95%A0-%EC%A6%9D%EC%83%81/%EB%87%8C-%EC%B2%99%EC%88%98-%EB%B0%8F-%EC%8B%A0%EA%B2%BD-%EC%9E%A5%EC%95%A0-%EC%A6%9D%EC%83%81-%EC%95%88%EB%82%B4
38. Lim YK. Job stress and fatigue on the five-star hotel chef kitchen environment factors influence [master's thesis]. [Suwon]: Kyonggi University; 2015. 81 p.
39. Texas Department of Insurance. Workplace Safety Sleep & Fatigue Shift Worker Safety Training Program. [Internet]. Austein, TX: Texas Department of Insurance; The Texas Department of Insurance, Division of Workers' Compensation (DWC). [cited 2023 Feb 7]. Available from: https://www.tdi.texas.gov/pubs/videoresource/stpshiftworkers.pdf
40. Lim HJ. The cause of chronic fatigue in the elderly, it may not be aging, but "this". Healthinnews [Internet]. 2020 Jul 21. [cited 2023 Mar 12]. Available from: https://www.healthinnews.co.kr/news/articleView.html?idxno=13744
41. Han SG. A study on the occupational characteristics of emotional labor in Korea. Journal of the Labor Studies. 2016;32:5-27.
42. Ministry of Employment and Labor. Guidelines for surveillance and intermittent worker approval judgment by apartment complex security guards" prepared and announced [Internet]. Seoul: Ministry of Employment and Labor. 2021 [cited 2023 Feb. 16]. Available from: http://www.moel.go.kr/news/enews/report/enewsView.do;jsessionid=4zI5vSuelr11LEU-TEDHqvQN4afJTJI16cppXONjkrrsGVBhNpjO1wkJbP-k70nOzJ.moel_was_outside_servlet_www1?news_seq=12833
43. Yoon SR, Kim TH, Park SW, Yoon BW, Cho E, Park JS. A study on differences of sleep quality among the community-dwelling, long-term care facility, and hospitalized elderly people. Korean Journal of Research in Gerontology. 2015;24:149-168.
44. Guo H, Zhou J, Chen H, Cao X. Prevalence and associated factors of poor sleep quality among Chinese retirees: A multicenter cross-sectional study. Journal of Affective Disorders. 2023;320(1):42-47. https://doi.org/10.1016/j.jad.2022.09.130

45. Yoon HS, Yang JJ, Song MK, Lee HW, Han SH, Lee SA, et al. Correlates of self-reported sleep duration in middle-aged and elderly Koreans: From the health examinees study. PloS One. 2015;10(5):e0123510. https://doi.org/10.1371/journal.pone.0123510
46. Choi JH, Kim KH, Cho YC. The quality of sleep and its relating factors in firefighting officers. Journal of the Korea Academia-Industrial Cooperation Society. 2018;19(5):451-458. https://doi.org/10.5762/KAIS.2018.19.5.451
47. Park ES, Shin ES, Cho YC. Quality of sleep and its associated factors among male workers in small-scale manufacturing industries. Journal of the Korea Academia-Industrial Cooperation Society. 2014;15(10):6193-6203. http://doi.org/10.5762/KAIS.2014.15.10.6193
48. Lee HY, Baek JT, Cho YC. Factors associated with self-rated health status for the elderlies in urban areas. Journal of the Korea Academia-Industrial Cooperation Society. 2016;17(10):569-581. http://doi.org/10.5762/KAIS.2016.17.10.569
49. Park EH. The effects of cognitive function, self-rated health and life satisfaction on smartphone use in older adults. The Korean Journal of Health Service Management. 2023;17(1):13-21. https://doi.org/10.12811/kshsm.2023.17.1.013
50. Yang IS. Relationship between health literacy and health status among community-dwelling elderly. Journal of Convergence for Information Technology. 2021;11(1):62-70. https://doi.org/10.22156/CS4SMB.2021.11.01.062

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노인의 이중 감각 저하가 인지기능 저하에 미치는 영향: 사회적 지지의 조절효과

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The Effect of Dual Sensory Impairment on Cognitive Function Decline in the Elderly: The Moderating Effect of Social Support

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Purpose: This study verified that the dual sensory impairment (DSI) in the elderly is associated with cognitive impairment (CI) and confirmed how change in cognitive function varies depending on the social support (SS).
Methods: For a study sample of Korean older people, data from the Korean Longitudinal Study of Ageing (KLoSA) from the 7th (2018) to the 8th (2020), were included in this cross-sectional descriptive study. Among people who responded in both 2018 and 2020, a total of 2,069 people of those who are 65 years of age or older, and have living children and normal cognitive function, were analyzed. X^2 -test, t-test and logistic regression analyses were utilized.
Results: First, the number of elderly with visual impairment (VI), hearing impairment, and DSI increased on 8th data compared with 7th data. In addition, 22.9% of the 2,069 people showed a decrease in cognitive function. Second, compared to the elderly with normal sensory function, the cognitive function of the elderly with only VI was found to be more degraded, and the cognitive function of the elderly with DSI was found to be much more degraded. In addition, among SS, only participation in social gatherings was found to show significant change in cognitive function of the elderly with DSI. Third, the interaction effect of participating in social gatherings was not significant in the CI of the elderly with DSI.
Conclusion: VI and DSI effected cognitive function, but participation in social gatherings such as SS has not significant interaction effect on CI of the elderly with DSI.

Keywords: cognitive function; sensation disorder; elderly; social support

서론

국내 65세 이상 노인 인구의 연평균 증가율이 3.3%로 OECD 국가 중 가장 빠르게 고령화 속도가 진행되어 고령사회 진입했으며[1], 2020년 기준 고령자 가구가 전체 가구의 22.8%를 차지하고 있다[2]. 따라서 노화로 인한 감각 기능 저하를 겪는 노인들의 수도 급증하고 있으며, 노인들의 감각 저하는 둘 이상의 감각이 동시에 저하되는 특징이 있다[3]. 한국 코호트 연구에 따르면, 58세 이상인 노인 6520명 중 약 15%가 감각이 정상인 반면, 약45%가 단일 감각 저하를, 약 40%가 이중 감각 저하를 가지고 있었다[4]. 감각 저하가

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있는 노인은 의사소통 제한으로 사회활동 기회가 줄어들면서 외로움을 느꼈고[5] 인지기능저하[6-9]까지 경험하게 된다.

인지기능 저하를 진단받은 경우 50% 이상이 5년 이내에 치매로 진행되므로[10], 인지기능 저하의 조기 예방 중요성을 강조되어 관련된 연구가 많이 진행되었다. 그러나 이중 감각 저하가 노인에게 빈번하게 발생할 수 있는 신체 노화 증상임에도 불구하고 단일 감각 저하 또는 증상 조절과 인지기능 간의 관계 연구 위주로 진행되었고[11-14], 심지어 감각 저하 증상을 위한 치료적 중재에는 경제적 한계가 따른다. 시력 보조장치와 인지기능에 대한 선행 연구가 없어 우울과 관련된 연구를 보면, 시력 저하가 있는 경우 시력 보조장치가 우울정도에 영향을 미치지 않으나, 시력저하 관련 상담이 우울정도 감소에 도움되는 것으로 나타났다[15]. 반면 청력 저하가 있는 경우 보청기 착용이 의사소통 문제를 줄이고 우울 증상을 개선시키며[16] 인지기능에 도움이 되었으나[14], 청력저하가 있는 노인의 70~85%가 보청기를 처방 받지 않았고, 처방을 받더라도 절반도 안 되는 노인이 보청기를 사용하지 않는다고 나타났다[17,18]. 그 이유는 개인의 청력 손실을 과소평가하거나 불편감, 비용 때문이었다[19,20]. 게다가 감각 저하 증상 조절과 관련된 경제적 한계 측면을 보면, 한국의 노인 빈곤율은 OECD평균의 3배인 43.4%로 개인의 경제적 어려움이 상대적으로 클 뿐만 아니라[21], 저하된 감각 기능 조절을 위한 중앙 정부 및 지자체의 예산이 충분하지 않아 지원받을 수 있는 대상자는 제한적이다[22,23].

이러한 한계를 보완하기 위해 본 연구는 사회적 지지를 저하된 감각 기능에 대한 예산에 부담이 있을 때 대체적 중재로서 활용하고자 한다. 가족과 이웃 같은 커뮤니티를 통한 사회적 지지는 큰 예산상 지원 없이 확보가 가능하여 비용 효율적이기 때문이다. 사회적 지지의 효과를 확인하기 위해 선행연구를 보면, 사회적 지지인 배우자와 이혼하거나 과부 또는 홀아비인 노인에게 치매 발생 가능성이 높았고[24] 자녀와의 접촉이 많을수록 인지기능 저하될 확률이 낮은 것으로 나타났다[25]. 그리고 사회 통합 참여를 할수록 인지기능 저하될 확률이 낮았다[26]. 뿐만 아니라 도구적 지지로서 세대 간 금전교류가 없거나 받기만 한 경우 인지기능이 감소되었고, 노인이 자녀에게 선물, 여행과 같은 비금전적 지원을 해주는 경우와 인지기능 간의 연관성이 있었다[27].

따라서 본 연구에서는 지역사회에 거주하는 전체 노인 중 이중 감각 저하가 있는 노인이 2년 후 인지기능 악화에 어떤 영향을 미치는지 파악하고, 사회적 지지의 수준이 이중 감각 저하와 인지기능 악화에 조절효과가 있는지 확인하고자 한다. 이를 위해 본 연구는 Verbrugge & Jette [28]의 장애과정모델을 기반으로, 병리적 특성과 손상을 하나로 묶어 이중 감각 저하를 한단계로 설정하고, 이중 감각 저하에 따른 신체적 또는 정신적 제한을 기능 제한 단계, 인지기능 저하를 장애 단계인 3단계로 수정 보완하여 구성하였다. 그리고 위험요인으로는 인구사회학적 요인, 내적요인은 건강 관련 특성, 외적 요인은 사회적 지지로 설정하였다(Figure 1).

연구방법

1. 연구 설계

본 연구는 한국고용정보원 포털 홈페이지(https://survey.keis.or.kr/)에서 제공한 7차(2018년), 8차(2020년) 고령화연구패널조사

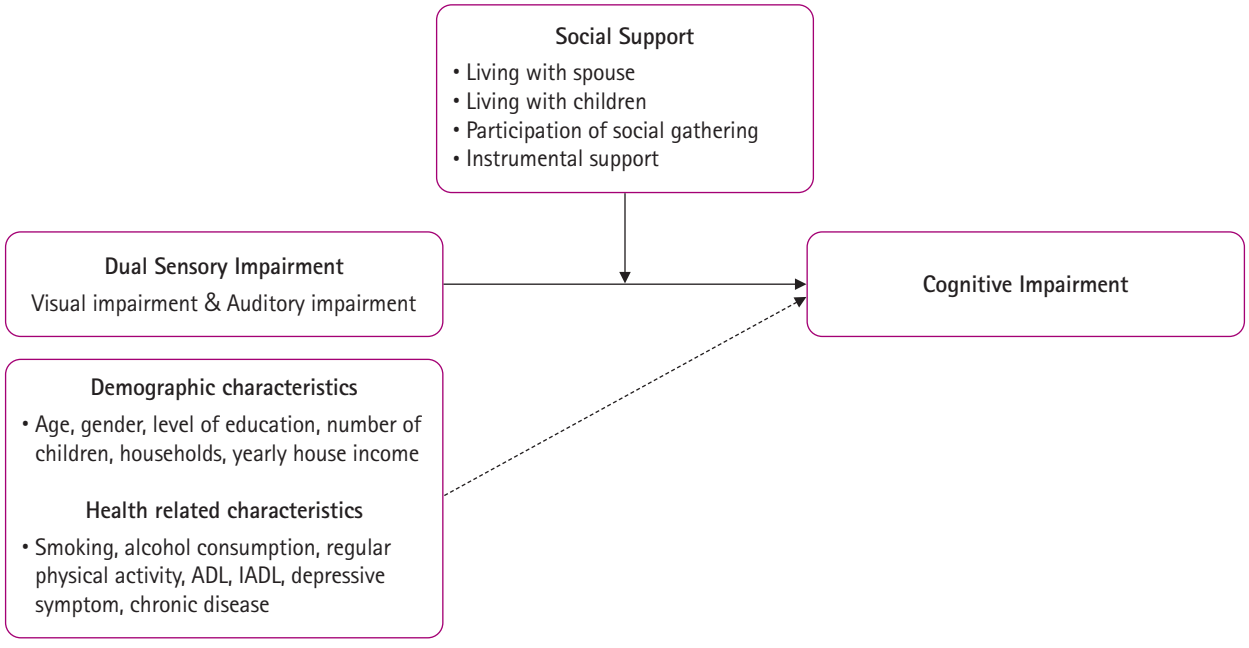

Figure 1. Research Framework of this study.

(Korean Longitudinal Study of Ageing, KLoSA)를 활용한 이차자료 분석연구로, 시력과 청력이 동시에 저하가 되는 이중 감각 저하가 있는 65세 이상의 노인을 대상으로 인지기능의 변화를 확인하고, 사회적 지지가 인지기능 변화에 미치는 조절효과를 파악하기 위한 서술적 상관관계 연구이다. 본 연구에서는 2018년에 응답한 대상자에서 65세 이상이고 인지기능에 문제가 없고 사회적 지지가 되는 동거 또는 비동거 하는 생존 자녀가 있는 대상자 중, 2020년에 응답하지 않은 경우를 제외하여 총 2069명을 분석하였다.

2. 연구 도구

1) 독립변수: 이중 감각 저하

2018년 고령화연구패널조사의 문항에서 시력, 청력에 대한 자가 평가하는 도구를 통하여 감각 기능 저하 여부를 분류하였다. 시력을 자가 평가하는 문항으로 '시력(교정시력 포함)은 어떻습니까?'과 청력을 자가 평가하는 문항은 '청력은 어떻습니까? 보청기를 사용하시는 경우는 보청기를 낀 상태를 말씀해 주십시오.'이다. 이 문항에 대한 응답은5점 Likert 척도로, 5점은 '매우 나쁨', 4점은 '나쁜 편', 3점은 '보통', 2점은 '좋은 편', 1점은 '매우 좋음'으로 스스로 시력과 청력 정도를 측정한다. 따라서 본 연구에서 '이중 감각 저하'란 시력과 청력에 대한 자가 평가 문항에 모두 4점 이상으로 나쁜 편 또는 매우 나쁨이라고 응답한 경우를 의미한다.

2) 종속변수: 인지기능

인지기능 측정에 사용되는 한국어판 간이정신상태 검사(Korean version of Mini-Mental State Examination: K-MMSE)는 총 점수 범위는 0-30점으로, 그 중 24점 미만일 때 인지기능 저하로 평가된다[29]. 본 연구에서는 2018년에는 인지기능 점수가 24점 이상으로 인지기능이 정상인 노인을 분석집단으로 포함하였으며, 2년 후인 2020년 인지기능 점수 중 24점 미만이 된 대상자를 '인지기능 저하'로, 24점 이상인 대상자를 '인지기능 유지'로 범주화 하였다.

3) 조절변수: 사회적 지지

사회적 지지는 감정, 관심과 같은 정서적 지지, 물질적 도움인 돈 또는 시간과 같은 도구적 지지, 긍정적인 자기 평가 및 수용과 같은 평가적 지지, 정보와 충고와 같은 정보적 지지로 구분한다[30]. 본 연구에서도 사회적 지지를 4가지로 구분하여 설정하려고 하였으나 고령화연구패널조사 데이터의 한계로, 배우자 또는 동거 자녀 유무, 사회모임 참여 여부, 도구적 지지로 세대 간 금전/비금전 지원 및 수령 여부로 사회적 지지를 설정하였다. 먼저 동거 가족 유무 및 사회모임 참여여부가 정서적 지지를 상징하기 어려워 따로 분류하였다. 그리고 사회적 지지를 받는 것으로만 정의하는 것은 전통적인 방향이고 최근에는 사회적 지지는 받는 것뿐만 아니라 제공하는 것도 동일한 이득이 생긴다는 인식이 증가하고 있어[31,32], 자녀와 부모 사이에 금전 또는 비금전을 주거나 받았는지에 대한 것을 도구적 지지로 설정하였다. 평가적, 정보적 지지로 측정할 수 있는 항목은 고령화연구패널조사 데이터에 존재하지 않아 사회적 지지로 설정하지 못하였다.

(1) 배우자 또는 동거 자녀 유무

배우자와의 동거여부는 고령화연구패널조사의 2018년 자료 중 최종 혼인상태 관련 문항에 대한 응답에서 혼인 중을 0, 별거나 이혼, 사별과 같은 그 외를 1로 범주화 하였다. 자녀와의 동거여부는 고령화연구패널조사의 2018년 자료 중 첫째부터 아홉째 자녀와 현재 함께 살고 있는지 확인하는 문항을 활용하여 자녀 한명이라도 동거하고 있으면 0, 없으면 1로 범주화 하였다.

(2) 사회모임 참여 여부

고령화연구패널조사의 2018년 자료 중 참여하고 있는 사회모임을 확인하는 문항에서 종교 모임, 친목 모임, 문화 관련단체, 동창회, 봉사모임, 시민단체 등과 같은 항목에 하나라도 참여한 경우는 0, 하나도 참여하지 않은 경우를 1로 범주화 하였다.

(3) 도구적 지지: 세대 간 금전/비금전 지원 및 수령 여부

도구적 지지는 고령화연구패널조사의 2018년 자료 중 자녀(동거와 비동거)에게 금전(용돈 및 생활비)과 비금전(여행 및 선물) 자원을 제공하거나, 자녀로부터 금전과 비금전 자원을 수령하는 것으로 측정하였다. 금전 교류 여부는 첫째부터 아홉째 자녀까지 "작년 한 해 동거/비동거 자녀와 정기적/비정기적으로 용돈과 같은 금전적 지원을 하셨습니까/받으셨습니까?"라는 문항에서 교류를 하는 경우(지원 또는 수령 둘 중에 하나라도 하는 경우 포함), 아예 교류가 없는 경우로 나누었다. 비금전 교류 여부 확인을 위해, 첫째부터 아홉째 자녀까지 "작년 한 해 동거/비동거 자녀와 정기적/비정기적으로 현물과 같은 비금전적 지원을 하셨습니까/받으셨습니까?"라는 문항에서 교류를 하는 경우(지원 또는 수령 둘 중에 하나라도 하는 경우 포함), 아예 교류가 없는 경우로 나누었다. 이렇게 금전 또는 비금전으로 구분한 자료의 자녀로부터 수령 또는 지원과 관련된 척도에서 지난 1년 동안 정기적/비정기적으로 수령 또는 지원받는 경우를 1, 그렇지 않은 경우를 0으로 범주화 하였다.

4) 통제 변수

고령화연구패널조사의 2018년 자료에서 인구사회학적 특성을 성별과 연령, 교육수준, 생존자녀(수), 세대구성, 경제수준(가구총소득)으로 구성하고, 건강 관련 특성을 생활습관(흡연, 음주), 운동, ADL(Activities of Daily Living), IADL(Instrumental Activities of Daily Living), 우울점수, 만성질환 수로 구성하여 통제하였다[33-41].

3. 자료 분석 방법

본 연구에서는 7차(2018년), 8차(2020년) 고령화연구패널조사 표본을 SPSS 29.0프로그램을 사용하여 다음과 같이 분석하였다.

1) 지역사회에 거주하는 인지기능이 정상이고 자녀가 있는 노인들의 일반적 특성을 파악하기 위해 기술통계 실시하여 평균, 표준편차, 빈도, 백분율을 분석하였다.
2) 감각 기능이 정상인 노인과 단일 감각 저하와 이중 감각 저하가 있는 노인의 인지기능의 차이를 비교하기 위해 t-test, χ^2 test 와 같은 차이검정을 분석하였다.
3) 이중 감각 저하 여부가 2년 후 인지기능 저하에 영향을 미치는지 파악하기 위하여 인지기능에 영향을 미치는 다른 요인을 보정한 후 다중 로지스틱 회귀분석을 분석하였다.
4) 이중 감각 저하와 인지기능 저하와의 관계에서 사회적 지지의 조절효과를 보기 위하여 상호작용 변수를 추가하여 다중 로지스틱 회귀분석을 실시하였다.

4. 윤리적 고려 사항

서울대학교 생명윤리위원회의 '연구 대상자 보호 심사위원회 면제' 심의 승인을 받은 후 시행하였다(IRB No. E2303/002-003).

연구결과

1. 연구대상자의 일반적 특성

분석 대상자 총 2069명의 일반적 특성은 Table 1과 같다. 7차(2018년)에는 인지기능 점수가 24점 이상으로 정상인 노인 중 473명이 8차(2020년)에 23점미만으로 인지기능이 저하가 되었다. 그리고 건강 관련 특성에서 이중 감각 저하가 있는 노인은 2018년에는 2.7%에서 2020년에는 2.9%로, 시력 저하가 있는 노인은 13.9%에서 15.8%로 청력 저하가 있는 노인은 4.0%에서 5.8%로 증가하였다. 반면 사회적 지지와 관련된 특성에서는 배우자가 있는 경우가 2018년에는 77.1%에서 2020년에는 74.1%로, 자녀와 동거하는 경우도 20.6%에서 18.6%로 감소하였다. 사회모임 참여 개수도 1.09±0.73개에서 0.94±0.78개로 감소하였다. 그리고 사회적 지지 중 도구적 지지인 세대간 금전 교류가 있는 경우도 25.6%에서 19.6%로, 비금전 교류가 있는 경우는 31.8%에서 27.4%로 감소하였다(Table 1).

2. 일반적 특성에 따른 인지기능 악화의 차이 분석

본 연구대상자의 일반적 특성에 따른 인지기능 악화의 차이를 χ^2과 t-test를 실시하여 분석한 결과는 Table 2와 같다. 대상자의 인구·사회학적 특성 중 연령, 성별, 교육수준, 생존자녀 수, 세대구성, 가구 총소득에 따라 인지기능 악화에 유의한 차이가 있는 것으로 나타났다. 인지기능이 악화된 노인의 평균 연령은 인지기능이 유지된 노인에 비해 약 3세 높았고 여성 노인 비율은 남성 노인 비율보다 인지기능 악화 비율이 높았다. 교육 수준에서 6년 이하 교육을 받은 경우가 6년 이상 교육받은 경우에 비해 인지기능이 악화되는 비율이 높았다. 인지기능이 악화된 노인이 유지된 노인에 비해 생존 자녀수가 많았고 세대 구성 중 독거세대 비율이 높았다. 가구 총소득에서 인지기능이 악화된 노인의 소득이 인지기능이 유지된 노인의 소득에 비해 약 6백 7십만원이 낮았다.

건강 관련 특성과 인지기능의 변화를 살펴본 결과, 흡연, 음주, 운동, IADL, 우울점수, 만성질환 수, 감각 저하가 유의하게 나타났다. 인지기능이 악화된 노인이 유지된 노인에 비해 흡연과 음주를 하는 비율이 낮았다. 그러나 인지기능이 악화된 노인이 유지된 노인에 비해 수단적 일상생활수행능력에 독립적이지 않은 비율이 높은 것으로 나타났다. 그리고 우울 점수는 인지기능이 악화된 노인이 유지된 노인에 비해 약 1.9점 높았고, 만성질환 수도 약 0.4개 많았다. 인지기능이 악화된 노인이 유지된 노인에 비해 이중 감각 저하, 시력 저하, 청력 저하가 있는 비율이 높은 것으로 나타났다.

사회적 지지와 관련된 특성과 인지기능의 변화를 확인한 결과, 배우자 여부, 사회모임 참여 여부, 세대 간 금전교류가 통계적으로 유의하다고 나타났다. 인지기능이 악화된 노인이 유지된 노인에 비해 배우자와 함께 살지 않는 비율이 높았고, 사회모임에 참여하지 않는 비율도 높았다. 반면 세대간 금전 교류를 하지 않는 노인은 교류하는 노인에 비해 인지기능 악화 비율이 낮았다(Table 2).

3. 감각 저하와 사회적 지지가 인지기능 저하에 미치는 영향

감각 저하와 사회적 지지가 인지기능 저하에 미치는 영향을 검증하기 위해, 다른 영향 요인인 일반적인 특성과 건강관련 특성을 보정한 후 다중 로지스틱 회귀분석으로 분석한 결과는 Table 3의 Model A와 같다(Table 3). 시력만 저하된 노인인 경우, 감각 기능이 정상인 노인에 비해 인지기능이 저하가 될 확률이 1.68배(95% CI: 1.24, 2.28) 높았으며, 이중 감각 저하가 있는 노인인 경우 인지기능 저하가 발생할 확률은 2.89배(95% CI: 1.56, 5.33) 높았다. 시력만 저하가 된 노인보다 이중 감각 저하가 있는 노인이 인지기능 저하될 확률이 더 높은 것으로 나타났다. 사회적 지지 관련 특성을 분석한 결과, 사회모임에 참여를 하지 않은 경우가 사회모임을 참여하는 경우보다 인지기능이 저하될 확률이 1.49배(95% CI: 1.11, 1.98) 높은 것으로 나타났다.

4. 이중 감각 저하와 인지기능 사이 사회적 지지의 조절효과

본 연구는 노인의 이중 감각 저하에 따른 인지기능 변화에서 다른 영향 요인들을 보정한 후, 인지기능 변화에 유의했던 사회적 지지인, 사회모임 참여여부의 조절효과를 검증하기 위해 다중 로지스틱 회귀분석을 수행하였고 결과는 Table 3의 Model B와 같다. 사회모임 참여 여부는 이중 감각 저하가 있는 노인의 인지기능 변화에 조절효과가 나타나지 않았다.

Table 1. General Characteristics of the Study Participants (*N*=2,069)

Variables		Time 1 (2018)	Time 2 (2020)
		n (%) or M ± SD	n (%) or M ± SD
Demographic Characteristics			
Age (years)		73.17 ± 5.95	75.17 ± 5.95
Gender	Female	1088 (52.6)	1088 (52.6)
	Male	981 (47.4)	981 (47.4)
Years of education	≤ 6years	853 (41.2)	857 (41.4)
	> 6years	1216 (58.8)	1212 (58.6)
Number of children		2.95 ± 1.16	2.56 ± 0.59
Household	Single	331 (16.0)	296 (14.3)
	Couple	1206 (58.3)	749 (36.2)
	Others	532 (25.7)	1024 ((49.5)
Yearly household income (in 1,000,000 Won)		23.19 ± 22.99	24.63 ± 35.47
Health-Related Characteristics			
Smoking	Current smoker	160 (7.7)	140 (6.8)
	Never/Former	1909 (92.3)	1929 (93.2)
Alcohol consumption	Current alcohol drinker	634 (30.6)	568 (27.5)
	Never/Former	1435 (69.4)	1501 (72.5)
Regular physical activity	≥ Once a week	849 (41.0)	995 (48.1)
	Never	1220 (59.0)	1074 (51.9)
ADL (range: 0~7)	Dependent (≥ 1)	11 (0.5)	39 (1.9)
	Independent (0)	2058 (99.5)	2030 (98.1)
IADL (range: 0~7)	Dependent (≥ 1)	121 (5.8)	180 (8.7)
	Independent (0)	1948 (94.2)	1889 (91.3)
Depressive symptoms (range: 10~40)		16.16 ± 3.71	16.54 ± 3.50
Number of chronic disease (range: 0~13)		1.52 ± 1.22	1.63 ± 1.24
Sensory impairment			
None		1643 (79.4)	1562 (75.5)
Visual impairment only		287 (13.9)	327 (15.8)
Auditory impairment only		83 (4.0)	119 (5.8)
Dual sensory impairment		56 (2.7)	61 (2.9)
Cognitive function (range: 0~30)			
Impairment (< 24)		0 (0)	473 (22.9)
Normal (≥ 24)		2069 (100)	1596 (77.1)
Social Support			
Living with/without spouse	No spouse (Separated/Widowed/Never married)	474 (22.9)	535 (25.9)
	Living with spouse	1595 (77.1)	1534 (74.1)
Living with/without children	Living without children	1642 (79.4)	1683 (81.3)
	Living with children	427 (20.6)	385 (18.6)
Participation of social gatherings (range: 0~7)		1.09 ± 0.73	0.94 ± 0.78
Instrumental support from children			
Monetary support	Neither	1539 (74.4)	1663 (80.4)
	Giver and taker	530 (25.6)	406 (19.6)
Non-monetary support	Neither	1411 (68.2)	1481 (71.6)
	Giver and taker	658 (31.8)	566 (27.4)

Note. Yearly household income unit is in 1,000,000 Korean won, which approximately equals US $100.; ADL means activities of daily living.; IADL represented instrumental activities of daily living.; Depressive symptoms were measured in using the Center for Epidemiologic Studies Depression(CES-D10).; Cognitive function is assessed in this study using the Korean Version of the Mini Mental Stated Examination(K-MMSE).; Chronic diseases included hypertension, diabetes mellitus, cancer, chronic pulmonary disease, liver disease, heart disease, cerebrovascular diseases, psychiatric disorder, arthritis or rheumatism, prostate disease, digestive system disease, slipped disk and dementia.; Regular physical activity indicated physical activity once a week.; Monetary support included allowance and living expenses.; Non-monetary support included gifts, trips, electronics, and supplement foods.

Table 2. Changes in Cognitive Function according to the General Characteristics of the Study Participants

Variables	Cognitive function maintenance (n = 1,596)	Cognitive function decline (n = 473)	t/x^2	*p*
	n(%) or M ± SD	n(%) or M ± SD		
Demographic Characteristics				
Age(years)	72.45 ± 5.64	75.59 ± 6.33	-9.72	< .001
Female (ref. male)	791 (49.6)	297 (62.8)	45.61	< .001
Education ≤ 6years (ref. > 6years)	554 (34.7)	299 (63.2)	122.33	< .001
Number of children	2.88 ± 1.10	3.21 ± 1.32	-5.05	< .001
Household				
Single household	231 (14.5)	100 (21.1)	14.60	< .001
Couple households	960 (60.2)	246 (52.0)		
Others	405 (25.4)	127 (26.8)		
Yearly household income	24.73 ± 24.72	18.02 ± 14.66	7.33	< .001
Health-Related Characteristics				
Current smoker (ref. Never/former)	139 (8.7)	21 (4.4)	9.32	.002
Current alcohol drinker (ref. Never/former)	530 (33.2)	104 (22.0)	21.62	< .001
Never regular physical activity (ref. ≥ Once a week)	883 (55.3)	337 (71.2)	38.23	< .001
ADL Dependent (ref. Independent)	7 (0.4)	4 (0.8)	1.14	0.285
IADL Dependent (ref. Independent)	77 (4.8)	44 (9.3)	13.29	< .001
Depressive symptoms (range: 10~40)	15.73 ± 3.25	17.63 ± 4.67	-8.29	< .001
Number of chronic disease (range: 0~13)	1.43 ± 1.19	1.84 ± 1.26	-6.28	< .001
Sensory impairment				
Dual sensory impairment	27 (1.7)	29 (6.1)	67.86	< .001
Auditory impairment only	53 (3.3)	30 (6.3)		
Visual impairment only	189 (11.8)	98 (20.7)		
None	1327 (83.1)	316 (66.8)		
Social support				
Living without spouse (ref. Living with spouse)	322 (20.2)	152 (32.1)	29.55	< .001
Living without children (ref. Living with children)	1271 (79.6)	371 (78.4)	0.32	0.571
No-participation in the social gathering (ref. ≥ 1 social gathering)	200 (12.5)	133 (28.1)	65.64	< .001
Instrumental support from children				
Monetary support				
Neither (ref. giver and taker)	432 (27.1)	98 (20.7)	7.72	0.005
Non-monetary support				
Neither (ref. giver and taker)	524 (32.8)	134 (28.3)	3.41	0.065

Note. Yearly household income unit is in 1,000,000 Korean won, which approximately equals US $100.; ADL means activities of daily living.; IADL represented instrumental activities of daily living.; Depressive symptoms were measured in using the Center for Epidemiologic Studies Depression(CES-D10).; Cognitive function is assessed in this study using the Korean Version of the Mini Mental Stated Examination(K-MMSE).; Chronic diseases included hypertension, diabetes mellitus, cancer, chronic pulmonary disease, liver disease, heart disease, cerebrovascular diseases, psychiatric disorder, arthritis or rheumatism, prostate disease, digestive system disease, slipped disk and dementia.; Regular physical activity indicated physical activity once a week.; Monetary support included allowance and living expenses.; Non-monetary support included gifts, trips, electronics, and supplement foods.

논의

본 연구는 고령화연구패널조사(KLoSA) 자료를 이용하여 노인의 이중 감각 저하가 인지기능에 미치는 영향과 사회적 지지의 조절효과를 파악하고자 하였다.

감각 기능이 정상인 노인에 비해 시력만 저하된 노인은 인지기능 저하가 발생할 확률이 1.68배 높았으나 이중 감각 저하가 있는 노인은 2.89배 더 높은 것으로 나타나, 미국의 코호트 연구의 연구결과와 일치하였다[42]. 다만, 본 연구에서는 청력 저하만 있는 노인의 경우 인지기능 저하 발생 확률이 유의미하게 높아지지 않았는데 이는 위의 선행 연구 결과와 상이하였다[42]. 상이한 결과가 발생한 원인에 대해 추정하면, 시력 저하가 있는 노인은 2년 동안 추적 관찰한 결과 인지기능 저하가 될 가능성이 크다는 선행 연구[43,44]가 진행된 것에 비해, 청력 저하가 있는 노인의 인지기능 같은 경우 5

Table 3. The Effect of Sensory Impairment on Cognitive Decline and Interaction Effects of Participation of Social Gathering as Social Support on Cognitive Decline

Variables		Model A		Model B	
		OR	95% CI	OR	95% CI
Covariates	Demographic variables				
	Age (Years)	1.06	1.04-1.08	1.06	1.04-1.08
	Female (ref. Male)	1.18	0.89-1.56	1.18	0.89-1.57
	Education ≤ 6 years (ref. > 6 years)	2.22	1.71-2.87	2.22	1.71-2.87
	Number of children	0.99	0.89-1.10	0.99	0.89-1.10
	Household (ref. Others)				
	Single household	0.73	0.41-1.30	0.73	0.41-1.30
	Couple households	0.79	0.51-1.23	0.79	0.51-1.23
	Yearly household income	0.99	0.98-1.00	0.99	0.98-1.00
	Health-related variables				
	Current smoker (ref. Never/former)	0.66	0.39-1.12	0.66	0.39-1.12
	Current alcohol drinker (ref. Never/former)	0.82	0.62-1.09	0.82	0.62-1.09
	Never regular physical activity (ref. ≥ Once a week)	1.63	1.27-2.09	1.63	1.27-2.09
	ADL Dependent (ref. Independent)	0.84	0.19-3.65	0.84	0.19-3.65
	IADL Dependent (ref. Independent)	1.31	0.82-2.09	1.31	0.82-2.09
	Depressive symptoms	1.13	1.10-1.16	1.13	1.09-1.16
	Number of chronic diseases (ref. None)	1.09	1.00-1.20	1.09	0.99-1.20
Sensory impairment	Sensory impairment (ref. None)				
	Visual impairment only	1.68	1.24-2.28	1.69	1.18-2.41
	Auditory impairment only	1.50	0.88-2.55	1.51	0.80-2.87
	Dual sensory impairment	2.89	1.56-5.33	2.84	1.26-6.40
Social support	Living with/without spouse or children				
	Living without spouse (ref. Living with spouse)	0.97	0.60-1.56	0.97	0.60-1.56
	Living without children (ref. Living with children)	1.01	0.64-1.61	1.01	0.64-1.61
	Participation in the social gathering				
	No-participation in the social gathering (ref. ≥ 1 social gathering)	1.49	1.11-1.98	1.49	1.05-2.13
	Instrumental support from children				
	Monetary support				
	Neither (ref. giver and taker)	0.87	0.65-1.17	0.87	0.65-1.17
	Non-monetary support				
	Neither (ref. giver and taker)	0.91	0.69-1.19	0.91	0.69-1.19
Sensory impairment × Social support	Sensory impairment*Participation in the social gathering				
	No-participation in the social gathering (ref. ≥ 1 social gathering)				
	Visual sensory impairment only × No-participation in the social gathering			0.99	0.50-1.96
	Auditory sensory impairment only × No-participation in the social gathering			0.97	0.31-3.04
	Dual sensory impairment × No-participation in the social gathering			1.04	0.30-3.61

년 또는 그 이상의 기간 동안 추적관찰 결과 인지기능 저하 또는 치매 발병률이 높다는 논문이 상대적으로 많았다[45-47]. 본 연구는 2년 간격의 단기간 연구이기 때문에 청력 저하와 인지기능 저하 간의 관계에 대한 입증이 어려웠던 것으로 판단된다. 따라서, 양자 간의 관계에 대한 정확한 분석을 위해서는 시력 저하가 있는 노인에 비해 청력 저하가 있는 노인의 경우 감각 저하가 인지기능에 영향을 주는 기전이 상대적으로 지연되는 점을 고려하여 장기간의 추적관찰이 있어야 할 것이다.

사회적 지지에 따른 인지기능 변화에 대한 검증에서, 사회모임을 하나도 참여하지 않은 노인은 하나라도 참여하는 노인에 비해 인지기능이 저하될 확률이 높은 것으로 나타나, 사회적 활동을 하지 않는 것이 낮은 인지기능과 관련 있다는 선행연구를 뒷받침할 수 있었다[48]. 그러나 사회모임 참여 여부의 조절효과는 유의하지 않은 것으로 나타났다. 이 결과는 이중 감각 저하가 있는 노인이 의사소통에 어려움을 겪고 있어 사회모임에 적극적으로 참여하지 못하고, 사회모임에 참여를 하더라도 의사소통 제한으로 우울 증상이 나타나 오히려 부정적으로 작용하여[49] 사회모임 참여의 조절효과를 입증하는데 제한이 있었을 것으로 생각된다. 따라서 사회모임 참여 여부 뿐 아니라 사회모임 참여 정도와 질에 관련한 추후 연구가 필요하다.

많은 선행 연구에서 노인의 인지기능 저하에 미치는 요인이 증명되었으나[33-41], 인지기능 저하를 예방할 수 있는 역동적 요인을 조절효과로 분석하는 연구는 미비한 실정이다. 따라서 본 연구는 감각 기능 저하 별 인지기능 저하 정도를 확인하고 인지기능 저하를 예방할 수 있는 차별화된 중재개발을 위해 진행되었다. 하지만 사회적 지지의 조절효과를 입증하기에는 다음과 같은 제한점이 있었다. 첫째, 7차(2018년), 8차(2020년) 두 시점만 활용해 청력 저하가 있는 노인의 인지기능 변화까지 입증하는데 제한 있었고, 이중 감각 저하 대상자 수가 충분치 않아 사회모임 참여의 조절효과 검증에 한계가 있었다. 둘째, 시력과 청력을 자가 평가하여 객관성이 낮은 측면이 있다. 셋째, 본 연구는 사회적 지지의 질적인 부분인 심리·정서적인 면을 고려하지 않았다. 넷째, 고령화연구패널조사는 지난 1년간의 과거를 회상하여 측정하는 설문조사로 설문자에게 더 나은 모습을 보여주기 위해 회상 비뚤림(recall bias)이 있을 수 있어 실제로는 세대 간 교류가 없었는데 있었다고 응답하는 비율이 높이는 방향으로 작용되었을 수 있다. 마지막으로, 사회적 지지의 경우 시간이 지남에 따라 변화 가능성이 많은데 본 연구에서는 이런 역동적인 특성을 고려하지 않은 것에 한계가 있다.

결론

본 연구는 인지기능이 정상이고 자녀가 있는 65세 이상인 이중 감각 저하가 있는 노인의 인지기능에 미치는 영향과 사회적 지지의 조절효과를 알아보았다. 노인의 시력 저하와 이중 감각 저하는 인지기능 저하에 유의한 영향을 미쳤으나 청력 저하는 유의하지 않았다. 그리고 사회적 지지인 사회모임 참여 여부는 인지기능 저하에 대한 영향 요인으로 검증되었지만, 이중 감각 저하가 있는 노인의 인지기능 저하를 예방하기 위한 중재로 활용하기 위한 조절효과 검증에는 유의하지 않은 것으로 나타났다.

본 연구결과를 토대로 지역 사회 간호 적용에 있어 다음과 같은 제언을 하고자 한다.

첫째, 두 시점보다 많은 시점의 자료를 사용하는 것이 더욱 안정적일 것으로 생각된다.

둘째, 신체검진과 같은 객관적인 시력 및 청력 사정 자료를 활용할 수 있다.

셋째, 사회적 지지에서 만족도와 같은 질적인 측면을 고려할 필요가 있다.

넷째, 변화 가능성이 높은 사회적 지지를 고려하여, 복합 표본 분석을 할 필요가 있다.

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Conflict of interest

Ju Young Yoon is an editorial board member of the Journal of Korean Community Health Nursing. She will not involve in the review process of this manuscript. No conflict of interest has been declared by authors.

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Authors' contributions

Soo Jee Yang contributed to conceptualization, data curation, formal analysis, methodology, project administration, and writing – original draft, review & editing. Ju Young Yoon contributed to conceptualization, methodology, supervision, validation, and writing – review & editing.

Data availability

The survey data were collected from Korea Longitudinal Study on Aging(KLoSA). Detail information about the data is available on the KLoSA website (https://survey.keis.or.kr/index.jsp).

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References

1. Statistics Korea. Life expectancy at birth and disability adjusted life expectancy [Internet]. Daejeon: Statistics Korea. 2021 [cited 2023 Jan 3]. Available from: https://www.index.go.kr/potal/main/EachDtlPageDetail.do?idx_cd=2758
2. Statistics Korea. Population projections for Korea [Internet]. Daejeon: Statistics Korea. 2019 [cited 2023 Jan 3]. Available from: http://kosis.kr/statHtml/statHtml.do?orgId=101&tblId=DT_1B040M5&conn_path=I3
3. Correia C, Lopez KJ, Wroblewski KE, Huisingh-Scheetz M, Kern DW, Chen RC, et al. Global sensory impairment in older adults in the United States. Journal of the American Geriatrics Society. 2016;64(2):306–313. https://doi.org/10.1111/jgs.13955
4. Byeon G, Oh GH, Jhoo JH, Jang JW, Bae JB, Han JW, et al. Dual sensory impairment and cognitive impairment in the Korean longitudinal elderly cohort. Neurology. 2021;96(18):e2284–e2295. https://doi.org/10.1212/wnl.0000000000011845
5. Mick P, Parfyonov M, Wittich W, Phillips N, Guthrie D, Kathleen Pichora-Fuller M. Associations between sensory loss and social networks, participation, support, and loneliness: Analysis of the Canadian longitudinal study on aging. Canadian Family Physician Medecin de Famille Canadien. 2018;64(1):e33–e41.
6. Bae SH, Kim GY. The association between self-reported sensory impairment and cognitive function among Korean older adults: Results from the 2017 national survey of the living conditions and welfare needs of older Koreans. Journal of the Korean Gerontological Society. 2019;39(2):389–404. http://doi.org/10.31888/JKGS.2019.39.2.389
7. Davidson JGS, Guthrie DM. Older adults with a combination of vision and hearing impairment experience higher rates of cognitive impairment, functional dependence, and worse outcomes across a set of quality indicators. Journal of Aging and Health. 2019;31(1):85–108. https://doi.org/10.1177/0898264317723407
8. Hong T, Mitchell P, Burlutsky G, Liew G, Wang JJ. Visual impairment, hearing loss and cognitive function in an older population: Longitudinal findings from the Blue Mountains Eye Study. PloS One. 2016;11(1):e0147646. https://doi.org/10.1371/journal.pone.0147646
9. Wallhagen MI, Strawbridge WJ, Shema SJ, Kurata J, Kaplan GA. Comparative impact of hearing and vision impairment on subsequent functioning. Journal of the American Geriatrics Society. 2001;49(8):1086–1092. https://doi.org/10.1046/j.1532-5415.2001.49213.x
10. Gauthier S, Reisberg B, Zaudig M, Petersen RC, Ritchie K, Broich K, et al. Mild cognitive impairment. The Lancet. 2006;367(9518):1262–1270. https://doi.org/10.1016/S0140-6736(06)68542-5
11. Harrabi H, Kergoat MJ, Rousseau J, Boisjoly H, Schmaltz H, Moghadaszadeh S, et al. Age-related eye disease and cognitive function. Investigative Ophthalmology & Visual Science. 2015;56(2):1217–1221. https://doi.org/10.1167/iovs.14-15370
12. Teipel S, Fritze T, Ovari A, Buhr A, Kilimann I, Witt G, et al. Regional pattern of dementia and prevalence of hearing impairment in Germany. Journal of the American Geriatrics Society. 2015;63(8):1527–1533. https://doi.org/10.1111/jgs.13561
13. Wood J, Chaparro A, Anstey K, Lacherez P, Chidgey A, Eisemann J, et al. Simulated visual impairment leads to cognitive slowing in older adults. Optometry and Vision Science : Official Publication of the American Academy of Optometry. 2010;87(12):1037–1043. https://doi.org/10.1097/opx.0b013e3181fe64d7
14. Amieva H, Ouvrard C. Does treating hearing loss in older adults improve cognitive outcomes? A review. Journal of Clinical Medicine. 2020;9(3):805. https://doi.org/10.3390/jcm9030805
15. Horowitz A, Reinhardt JP, Boerner K. The effect of rehabilitation on depression among visually disabled older adults. Aging & Mental Health. 2005;9(6):563–570. https://doi.org/10.1080/13607860500193500
16. Nkyekyer J, Meyer D, Pipingas A, Reed NS. The cognitive and psychosocial effects of auditory training and hearing aids in adults with hearing loss. Clinical Interventions in Aging. 2019;14:123–135. https://doi.org/10.2147/cia.s183905
17. Bisgaard N, Ruf S. Findings from EuroTrak surveys from 2009 to 2015: Hearing loss prevalence, hearing aid adoption, and benefits of hearing aid use. American Journal of Audiology. 2017;26(3S):451–461. https://doi.org/10.1044/2017_aja-16-0135
18. Wilson RH, Noe CM, Cruickshanks KJ, Wiley TL, Nondahl

DM. Prevalence and degree of hearing loss among males in the Beaver Dam Cohort: Comparison of veterans and nonveterans. Journal of Rehabilitation Research and Development. 2010;47(6):505–520. https://doi.org/10.1682/jrrd.2009.10.0169
19. Zazove P, Plegue MA, McKee MM, DeJonckheere M, Kileny PR, Schleicher LS, et al. Effective hearing loss screening in primary care: The early auditory referral-primary care study. Annals of Family Medicine. 2020;18(6):520–527. https://doi.org/10.1370/afm.2590
20. Jenstad L, Moon J. Systematic review of barriers and facilitators to hearing aid uptake in older adults. Audiology Research. 2011;1(1):e25. https://doi.org/10.4081/audiores.2011.e25
21. Lee SH, Choo NH, Kim HJ. Although Korea's aging rate is the fastest, the poverty rate for the elderly already ranks the first in the OECD. Korea Economic Research Institute Post. 2021 February [cited 2023 Jan 3] Available from: http://www.keri.org/web/www/news_02?p_p_id=EXT_BBS&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&_EXT_BBS_struts_action=%2Fext%2Fbbs%2Fview_message&_EXT_BBS_messageId=356132
22. Ministry of Health and Welfare. Project to Prevent and Manage Blindness for the Elderly [Internet]. Sejong: Ministry of Health and Welfare. 2017 [cited 2023 Jan 21]. Available from: http://www.mohw.go.kr/react/policy/index.jsp?PAR_MENU_ID=06&MENU_ID=06390103&PAGE=3&topTitle=
23. Chae SW. A Study on the application of National Health Insurance Service to the hearing aids in the hearing impaired elderly. Research Report. Wonju: National Health Insurance Service; 2020.Report No.: 2020-2-0005.
24. Liu H, Zhang Y, Burgard SA, Needham BL. Marital status and cognitive impairment in the United States: Evidence from the National Health and Aging Trends Study. Annals of Epidemiology. 2019;38:28–34. https://doi.org/10.1016/j.annepidem.2019.08.007
25. Barnes LL, De Leon CFM, Wilson RS, Bienias JL, Evans DA. Social resources and cognitive decline in a population of older African Americans and whites. Neurology. 2004;63(12):2322–2326. https://doi.org/10.1212/01.wnl.0000147473.04043.b3
26. Zunzunegui MV, Alvarado BE, Del Ser T, Otero A. Social networks, social integration, and social engagement determine cognitive decline in community-dwelling Spanish older adults. The Journals of Gerontology. Series B: Psychological Sciences and Social Sciences. 2003;58(2):S93–S100. https://doi.org/10.1093/geronb/58.2.s93
27. Lee WJ, Kim HG, Kim H, Yoo SR, Jang SE, Oh MK. Tangible social support and cognitive decline in the elderly: The Korean longitudinal study of aging. Korean Journal of Family Practice. 2017;7(3):337–341. https://doi.org/10.21215/kjfp.2017.7.3.337
28. Verbrugge LM, Jette AM. The disablement process. Social Science & Medicine (1982). 1994;38(1):1–14. https://doi.org/10.1016/0277-9536(94)90294-1
29. Kang YW, Na DL, Hahn SH. A validity study on the Korean Mini-Mental State Examination(K-MMSE) in dementia patients. Journal of the Korean Neurological Association. 1997;15(2):300–308.
30. House JS. Work stress and social support. 1st ed. Boston MA: Addison-Wesley Pub. Co., Reading, Mass; 1981. 156 p.
31. Brown SL, Nesse RM, Vinokur AD, Smith DM. Providing social support may be more beneficial than receiving it: Results from a prospective study of mortality. Psychological Science. 2003;14(4):320–327. https://doi.org/10.1111/1467-9280.14461
32. Väänänen A, Buunk BP, Kivimäki M, Pentti J, Vahtera J. When it is better to give than to receive: Long-term health effects of perceived reciprocity in support exchange. Journal of Personality and Social Psychology. 2005;89(2):176–193. https://doi.org/10.1037/0022-3514.89.2.176
33. Park JS, Lee YW, Kim HS. Cognitive impairment risk factors in elders. Journal of Korean Gerontological Nursing. 2015;17(3):121–130. http://doi.org/10.17079/jkgn.2015.17.3.121
34. Senger J, Bruscato NM, Werle B, Moriguchi EH, Pattussi MP. Nutritional status and cognitive impairment among the very old in a community sample from southern Brazil. The Journal of Nutrition, Health & Aging. 2019;23(10):923–929. https://doi.org/10.1007/s12603-019-1230-x
35. Chen L, Cao Q. Poverty increases the risk of incident cognitive impairment among older adults: A longitudinal study in China. Aging & Mental Health. 2020;24(11):1822–1827. https://doi.org/10.1080/13607863.2019.1663491
36. Lee HK, Lee KH. Health-related factors influencing cognitive impairment of the elderly in primary health care posts: With focus on eating habits, activities of daily living, alcohol drinking, and smoking. Journal of the Korean Data Analysis Society. 2016;18(2):965–979.
37. Hoang TD, Reis J, Zhu N, Jacobs DR JR, Launer LJ, Whitmer RA, et al. Effect of early adult patterns of physical activity and television viewing on midlife cognitive function. JAMA Psychiatry. 2016;73(1):73–79. https://doi.org/10.1001/jamapsy-

chiatry.2015.2468
38. Muhammad T, Meher T. Association of late-life depression with cognitive impairment: Evidence from a cross-sectional study among older adults in India. BMC Geriatrics. 2021;21(1):364. https://doi.org/10.1186/s12877-021-02314-7
39. Muhammad T, Govindu M, Srivastava S. Relationship between chewing tobacco, smoking, consuming alcohol and cognitive impairment among older adults in India: a cross-sectional study. BMC geriatrics. 2021;21(1):1–14. https://doi.org/10.1186/s12877-021-02027-x
40. Gold DA. An examination of instrumental activities of daily living assessment in older adults and mild cognitive impairment. Journal of Clinical and Experimental Neuropsychology. 2012;34(1):11–34. https://doi.org/10.1080/13803395.2011.614598
41. Lee JE. The relationship between cognitive function and physical health factors in the elderly. Journal of the Korean Gerontological Society. 2022;42(3):481–497. http://doi.org/10.31888/JKGS.2022.42.3.481
42. Maharani A, Dawes P, Nazroo J, Tampubolon G, Pendleton N. Associations between self-reported sensory impairment and risk of cognitive decline and impairment in the health and retirement study cohort. The Journals of Gerontology: Series B, Psychological Sciences and Social Sciences. 2020;75(6):1230–1242. https://doi.org/10.1093/geronb/gbz043
43. Lin MY, Gutierrez PR, Stone KL, Yaffe K, Ensrud KE, Fink HA, et al. Vision impairment and combined vision and hearing impairment predict cognitive and functional decline in older women. Journal of the American Geriatrics Society. 2004;52(12):1996–2002. https://doi.org/10.1111/j.1532-5415.2004.52554.x
44. Naël V, Pérès K, Dartigues JF, Letenneur L, Amieva H, Arleo A, et al. Vision loss and 12-year risk of dementia in older adults: The 3C cohort study. European Journal of Epidemiology. 2019;34(2):141–152. https://doi.org/10.1007/s10654-018-00478-y
45. Deal JA, Betz J, Yaffe K, Harris T, Purchase-Helzner E, Satterfield S, et al. Hearing impairment and incident dementia and cognitive decline in older adults: The health ABC study. The Journals of Gerontology. Series A: Biomedical Sciences and Medical Sciences. 2017;72(5):703–709. https://doi.org/10.1093/gerona/glw069
46. Tomioka K, Okamoto N, Morikawa M, Kurumatani N. Self-reported hearing loss predicts 5-year decline in higher-level functional capacity in high-functioning elderly adults: The Fujiwara-Kyo study. Journal of the American Geriatrics Society. 2015;63(11):2260–2268. https://doi.org/10.1111/jgs.13780
47. Wallhagen MI, Strawbridge WJ, Shema SJ. The relationship between hearing impairment and cognitive function: A5-year longitudinal study. Research in Gerontological Nursing. 2008;1(2):80–86. https://doi.org/10.3928/19404921-20080401-08
48. Evans IEM, Martyr A, Collins R, Brayne C, Clare L. Social isolation and cognitive function in later life: A systematic review and meta-analysis. Journal of Alzheimer's Disease : JAD. 2019;70(s1):S119–S144. https://doi.org/10.3233/jad-180501
49. Tseng YC, Gau BS, Liu TC, Hsieh YS, Huang GS, Lou MF. Association between sensory impairments and restricted social participation in older adults: A cross-sectional study. Collegian. 2022;29(6):850–859. https://doi.org/10.1016/j.colegn.2022.06.002

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택배기사의 건강상태 구조모형: 건강생성이론 기반

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A Structural Equation Model on Health Status in Delivery Workers: Based on the Theory of Salutogenesis

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Purpose: This study aimed to develop and test a structural equation model on health status of delivery workers. The conceptual model was based on the theory of salutogenesis.
Methods: Data were collected from 262 delivery workers working in D and K cities from August 2 to August 27, 2021. The structural equation model was used to assess the relationships among the variables. The model comprised three exogenous variables (working environment, social support, health promotion activities) and two endogenous variables (sense of coherence, health status). The data were analyzed using SPSS 23.0 and AMOS 22.0.
Results: The hypothetical model showed a good fit to the data: χ^2/df=2.38, TLI=.91, CFI=.93, SRMR=.08, RMSEA=.07. Out of 10 research hypotheses, 10 were supported, and explained 62.3% of the variance in the health status of delivery workers. The model confirmed that sense of coherence was the most important factor. Health status is directly affected by working environment, social support, and health promotion activities. Health status is indirectly affected by working environment, social support, and health promotion activities through mediation of sense of coherence.
Conclusion: The theory of salutogenesis is adequate to use for developing health promotion programs for delivery workers. There is a need to develop a customized program to increase health status of delivery workers by enhancing sense of coherence.

Keywords: Health status; Sense of coherence; Transportation; Worker; Workplace

서론

1. 연구의 필요성

최근 1인 가구 및 맞벌이 가구의 증가와 COVID-19로 대면에서 비대면으로 생활 전반이 변화하였다. 이와 함께 발달된 정보통신 기술로 생활방식과 업무방식이 비접촉식으로 빠르게 전환됨에 따라 오프라인 소비는 줄어들고 온라인 소비가 증가하는 추세이다. 2021년 통계청 조사결과에 따르면 온라인 쇼핑의 증가와 함께 총 택배 물량이 전년 대비 7.59% 증가하였으며, 15세 이상 국민 1인당 연간 평균 택배 이용횟수는 128.4회로 꾸준히 증가하고 있다[1]. 2020년 택배업 종사자 수는 54,120명으로 전년대비 20% 가까이 증가하였으며[2], 2020년부터 본격적인 COVID-19로 인한 택배업에 종사하는 근로자 수는 지속적으로 증가하고 있다[3].

택배산업의 꾸준한 성장과 택배기사의 지속적인 증가에도 불구

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하고 온라인 쇼핑의 폭발적인 증가로 인해 택배기사의 평균 근로시간이 늘어났으며, 물량 또한 늘어나 택배기사의 업무부담이 증가하고 있다. 택배기사의 평균 근로시간은 법정 근로시간을 초과하였으며[3-5] 근로시간이 52시간 이상인 장시간 근로자는 과반으로 이러한 장시간 근로는 근로자의 안전과 건강의 위협이 된다[3,6]. 또한 이들은 다른 직종에 비해 근로환경 만족도가 낮았으며[5], 택배기사의 1/3 이상이 전신피로감을 느끼고[3,7] 그 외에도 두통, 수면장애, 위장장애 등을 호소하고 있다[3,4].

택배기사는 장시간 근로로 인한 건강문제와 더불어 무거운 택배 물건 이동에 따른 근골격계 부담이 크다. 중량물 분류 및 이동 등의 반복적인 동작, 통증을 주는 부적절한 작업자세는 근골격계질환을 유발시키며[3,5], 이러한 근골격계 위험요인은 택배기사의 건강에 영향을 미치는 주요 요인이다[7]. 또한 택배기사가 운전할 때의 핸들과 의자의 진동은 택배기사의 허리건강에 부정적인 영향을 주고 있다[8].

또한 택배기사는 고객의 불만 처리, 복잡한 노·사 관계, 시간적 압박감, 과도한 직무부담 등으로 인해 과반 정도가 직무스트레스를 경험하고 있다[7]. 업무수행과정에서 경험하는 직무스트레스는 심혈관계질환, 고혈압 등의 건강문제를 유발시킨다[9]. 이와 함께 택배기사는 고객으로부터 부당한 대우를 받음으로써 정신적 부담이 많은 환경에 노출되는데[3,4] 감정노동을 겪은 사람들은 신체적 피로, 두통, 불면증 등의 증상을 호소하는 경우가 많았다[10]. 감정노동은 정서적 소진과 함께 우울과 같은 정신적 건강문제와 고혈압, 심장질환과 같은 신체적 건강문제를 발생시키는 것으로 나타났으며[11], 질병으로 인한 결근, 높은 이직률과 생산성 저하 등과 같은 사회적 건강문제를 일으키는 것으로 나타났다[12,13]. 이렇듯 택배기사는 근로환경과 관련된 신체적, 정신적, 사회적 건강문제를 경험하고 있다[3-5,7-9,12]. 택배기사의 건강을 유지 및 증진시키기 위해서는 먼저 택배기사가 경험하고 있는 전반적인 스트레스 요인인 근로환경과 함께 건강관련 요인들을 전체적으로 이해하는 것이 중요하다.

Antonovsky [14,15]의 건강생성이론은 일반적 저항자원과 통합성을 이용하여 다양한 스트레스를 스스로 극복하여 건강에 도달하는 과정을 말하고 있다. 스트레스원은 피할 수 없으며 삶의 과정에서 지속적으로 발생하는 것으로 이 스트레스원이 긴장 상태를 가져오게 된다. 이러한 긴장 상태를 적절하게 처리하면 건강한 상태로 향하게 되며, 적절하게 처리하지 못하면 질병에 이환 될 수 있는데, 이 스트레스 반응과정에서 개인의 능력과 함께 자원의 중요성을 강조하고 있다[14]. 이 이론에서 스트레스를 조절하는 중요 요소로 일반적 저항자원과 통합성을 제시하였는데 이들은 서로 긴밀하게 상호작용하며 스트레스로 인한 긴장 상태와의 작용을 통해 건강상태에 영향을 준다[14,15]. 또한 일반적 저항자원은 개인에게 충분한 경험을 제공하고 이러한 경험은 통합성을 형성하는데 영향을 주며, 통합성은 스트레스의 조절과 함께 일반적 저항자원을 활용할 수 있는 능력을 포함하고 있다[14-16]. 일반적 저항자원 중 사회적 지지는 조직 생산성 및 질병에 영향을 미치는 것으로 나타났다[12]. 하지만 택배기사의 대부분은 혼자 근무하며[4], 특수형태 근로종사자 비율이 높은 택배기사는 직장에서의 지지체계가 미약한 것으로 보고되었다[17]. 또한 택배기사는 음주, 흡연, 운동, 식생활, 수면과 같은 건강증진행위를 제대로 이행하지 못하고 있었다[3]. 건강생성이론은 일반적 저항자원이 긴장 상태와 상호작용하고, 일반적 저항자원과 통합성을 통해서 스트레스에 능동적으로 대처함으로써 건강을 생성하는 이론으로 다양한 건강위험요인에 노출되어 있는 택배기사가 스트레스에 적합한 저항자원을 활용하여 건강한 상태에 이를 수 있도록 돕는데 유용하다. 또한 건강생성이론은 택배기사의 다양한 건강위험요인을 통합적으로 해결하기에도 적합한 이론으로 판단된다.

지금까지 택배기사의 건강과 관련된 선행연구로 택배기사의 건강에 중요한 영향을 미치는 스트레스 자발적 적응 및 대응자원의 활용, 통합성에 관한 연구는 부족하다. 이에 본 연구는 건강생성이론을 적용하여 택배기사의 근로환경을 확인하고 건강상태에 영향을 주는 사회적 지지, 건강증진행위와 같은 저항자원과 통합성을 전체적으로 설명하는 가설적 건강모형을 구축하여 검증하고자 한다. 이러한 모형은 택배기사의 건강문제를 종합적으로 이해하고 건강생성을 위한 건강중재 적용의 과학적 근거자료로 활용될 수 있을 것이다.

2. 연구의 목적

본 연구는 택배기사의 건강상태에 대한 구조모형을 구축하고 모형의 적합도를 검증한 후, 건강상태에 영향을 주는 변인들의 영향력과 각 변인들의 직·간접 효과를 확인하기 위하여 시도되었다.

3. 연구의 개념적 기틀과 가설적 모형

본 연구는 Antonovsky [14,15]의 건강생성이론을 기반으로 한 연구로 통합성이 건강에 가장 중요하게 미치는 요인이고, 통합성에 영향을 주는 일반적 저항자원의 확보 여부가 건강상태의 개인적인 차이를 가장 잘 설명해준다고 가정하였다. 일반적 저항자원은 개인에게 유의미한 일관성 있는 경험을 제공하며, 이러한 경험을 일반적 저항자원으로 활용하면 스트레스원을 극복하여 긴장을 해소할 수 있으며, 성공적인 긴장해소는 건강한 상태로 이어진다[14]. 또한 다양한 경험을 제공하는 일반적 저항자원은 개개인의 통합성을 형성하고 개발하는데 영향을 주며[14,18], 높은 통합성은 일반적 저항자원과 함께 건강-질병 연속선상에서 건강한 방향으로 나아가도록 한다.

선행연구를 기반으로 하여 택배기사의 건강상태와 관련된 요인들을 종합하여 설정한 연구의 개념적 기틀을 바탕으로 연구의 가설적 모형을 3개의 외생변수와 2개의 내생변수로 구성하였다. 외생변수는 모형 내 다른 변수에 의해 설명이 되지 않는 변수로 근로환경,

사회적 지지, 건강증진행위로 구성되어 있다. 내생변수는 모형 내 다른 변수들에 의해 설명되는 변수로 통합성과 건강상태로 구성 되어있다. 통합성은 근로환경과 건강상태, 사회적 지지와 건강상태, 건강증진행위와 건강상태 간의 매개변수로 설정하였다(Figure 1).

연구방법

1. 연구 설계

본 연구는 택배기사의 건강상태를 설명하기 위해 건강생성이론을 기반으로 가설적 모형을 구축·검증하는 구조모형 분석연구이다.

2. 연구대상

연구대상자는 현재 택배회사에서 근무하고 있는 대구·경북에 소재한 택배기사로, 연구의 목적을 이해하고 연구 참여에 스스로 동의한 자이다. 구조방정식에서 적당한 표본수의 크기는 학자들마다 다양하게 제시하고 있으며 정확한 기준은 없다. 표본의 수가 많아지면 민감성이 증가하여 미세한 차이에도 적합도가 권장수준을 벗어나므로 AMOS 프로그램을 이용한 다변량 통계분석의 경우의 권고기준은 200-400개로 제시하고 있다[20]. 따라서 본 연구에서는 이상적인 표본 크기와 탈락률을 고려하여 250명을 목표로 자료를 수집하였다. 미회수 및 설문 응답 불량을 고려해 총 270부를 배부하여 회수하였고, 불성실한 응답이 포함된 설문지 8부를 제외하고 총 262부의 자료를 최종분석에 사용하였다.

3. 연구도구

본 연구의 도구는 전자우편을 통하여 도구 개발자 및 번안자의 승인을 받은 후 연구에 사용하였다. 구조방정식 모형 분석을 시작하기 전에 측정모형의 잠재변수와 관측변수가 타당하게 구성되었는지 확인하기 위해 연구도구에 대한 확인적 요인분석을 실시한 후, 연구에 사용하였다.

1) 일반적 특성

본 연구에서는 택배기사의 건강상태를 확인하기 위하여 건강상태와 관련이 있을 것으로 예측되는 연령, 성별, 결혼유무, 학력, 근무연수, 근로시간, 고용형태로 총 7문항을 조사하였다.

2) 근로환경

(1) 물리적 요인

물리적 요인은 물리적 및 인간공학적 요인을 고려해 한국산업안전보건공단 산업안전보건연구원의 '제5차 근로환경조사' 자료[21]를 참고하여 택배기사의 근무환경에 맞는 항목을 발췌하여 총 4문항으로 조사하였다. 각 항목은 '근무시간 내내' 1점에서 '절대 노출 안됨'의 7점 Likert 척도로 점수의 범위는 4-28점이고 점수가 높을수록 물리적 요인이 좋음을 의미한다. 본 연구에서 Cronbach's α=.85 이었다.

(2) 직무스트레스

직무스트레스는 Oh [19]가 제안한 택배집배송 기사의 직무스트레스 도구로 업무숙련도 5문항, 역할갈등 5문항, 역할과부하 4문

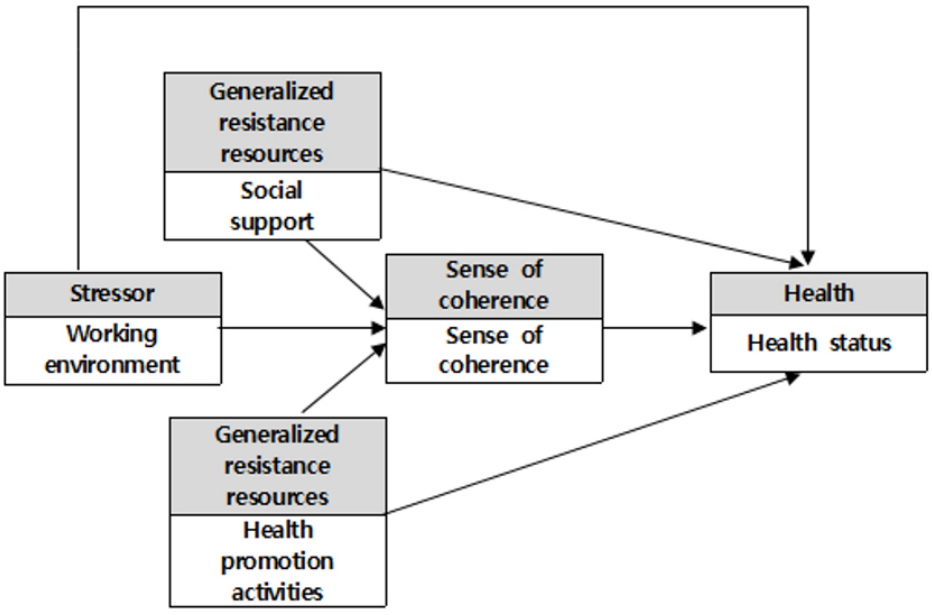


Figure 1. Conceptual framework of the study.

항, 조직체계 4문항, 업무특성 4문항, 직무자율 6문항의 총 28문항으로 구성되어 있다. 선행연구에서 각 문항은 5점 Likert 척도를 사용하여 직무스트레스를 많이 받을수록 높은 점수(5점), 적게 받을수록 낮은 점수(1점)을 부여하였다. 본 연구에서는 근로환경 측정도구인 물리적 요인, 감정노동과의 도구의 방향성 일치를 위해 직무스트레스를 적게 받을수록 높은 점수(5점), 직무스트레스를 많이 받을수록 낮은 점수(1점)을 부여하였다. 점수의 범위는 27-135점으로 점수가 높을수록 직무스트레스가 적음을 의미한다. Oh [19]의 연구에서 각 항목별 Cronbach α 계수는 업무숙련도 .75, 역할갈등 .69, 역할과부하 .71, 조직체계 .73, 업무특성 .71, 직무자율 .74이었다. 본 연구에서는 업무숙련도 .74, 역할갈등 .71, 역할과부하 .71, 조직체계 .71, 업무특성 .70, 직무자율 .77로 전체 Cronbach's α=.87 이었다.

(3) 감정노동

감정노동은 Baek 등[3]의 택배기사를 대상으로 한 연구에서 감정노동 관련 문항을 발췌하여 측정한 점수로 총 6문항으로 조사하였다. 각 항목은 4점 Likert 척도를 사용하여 '전혀 그렇지 않다' 1점에서 '매우 그렇다' 4점으로 구성되어 있으며 본 연구에서는 근로환경 측정도구인 물리적 요인, 직무스트레스와의 도구의 방향성 일치를 위해 역코딩하여 평가하였다. 점수의 범위는 6-24점이고 점수가 높을수록 감정노동이 적음을 의미한다. 본 연구자가 한 예비조사 결과 Cronbach's α=.74 이었고, 본 연구에서의 Cronbach's α=.85 이었다.

3) 사회적 지지

사회적 지지는 Zimet 등[22]이 사회적 지지 척도(Multidimensional Scale of Perceived Social Support, MSPSS)를 Shin과 Lee [23]가 번역한 도구를 사용하였다. 이 도구는 성인이 적절한 사회적 지지를 받고 있다고 인식하는 정도를 자가 보고식으로 평가하도록 되어 있으며, 3개의 하위영역인 의미 있는 타인지지 4문항, 가족지지 4문항, 친구지지 4문항으로 총 12문항으로 구성되어 있다. 각 문항은 5점 Likert 척도를 사용하여 '매우 그렇지 않다' 1점에서 '매우 그렇다' 5점으로 구성되어 있다. 점수의 범위는 12-60점이고 점수가 높을수록 사회적 지지가 높음을 의미한다. Zimet 등[22]의 연구에서 Cronbach's α=.85 이었고 Shin과 Lee [23]의 연구에서는 Cronbach's α=.89 이었으며 본 연구에서는 Cronbach's α=.95 이었다.

4) 건강증진행위

건강증진행위는 Walker 등[24]이 개발한 Health promoting lifestyle profile(HPLP)을 Jeon 등[25]이 수정·보완하여 측정한 도구를 사용하였다. 이 도구는 6개의 하위영역인 자아실현 6문항, 건강책임 3문항, 운동 3문항, 영양 5문항, 대인관계 지지 5문항, 스트레스 관리 4문항의 총 26문항으로 구성되어 있다. 각 문항은 '전혀 그렇지 않다' 1점에서 '매우 그렇다' 4점까지로 4점 Likert 척도로 조사하였다.

본 연구에서는 구성개념의 타당성을 확인하기 위해 확인적 요인분석을 실시한 결과 영양의 5문항에서 요인부하량이 .50 이하를 보여 5문항을 제거하였다. 점수의 범위는 21-84점으로 점수가 높을수록 건강증진행위가 좋음을 의미한다. Walker 등[24]의 연구에서 Cronbach's =.92 이었고 Jeon 등[25]의 연구에서는 Cronbach's =.84 이었으며 본 연구에서는 Cronbach's α=.91 이었다.

5) 통합성

Antonovsky [15]가 개개인의 통합성을 측정하기 위해 고안한 통합성 단축형 도구(13-short form Sense of Coherence: SOC)를 Kim 등[26]이 재구성한 수정된 통합성 지표를 사용하였다. 이 도구는 3개의 하위영역인 이해력 5문항, 관리력 4문항, 의미부여 4문항의 총 13문항으로 구성되어 있다. 각 항목은 7점 Likert 척도로 구성되어있고 5개의 역문항은 역코딩하여 평가하였다. 점수의 범위는 7-91점으로 점수가 높을수록 통합성이 높은 것을 의미한다. Kim 등[26]의 연구에서 Cronbach's α=.76 이었고 본 연구에서는 Cronbach's α=.92 이었다.

6) 건강상태

본 연구 도구는 동경대 건강지수(Todie Health Index: THI)를 Lim [27]이 재구성한 한국판 건강지수(Todie Health Index Korea version)로 조사하였다. 이 도구는 3개의 하위영역으로 신체적 건강 10문항, 정신적 건강 7문항, 사회적 건강 10문항으로 총 27문항으로 구성되어 있다. 각 항목은 5점 Likert 척도로 '전혀 그렇지 않다' 1점에서 '매우 그렇다' 5점으로 구성되어 있으며 본 연구 해석의 방향성을 통일하기 위하여 역코딩하여 분석하였다. 점수의 범위는 27-135점으로 점수가 높을수록 건강상태가 좋음을 의미한다. Lim [27]의 연구에서 Cronbach's α=.90 이었고 본 연구에서는 Cronbach's α=.87 이었다.

4. 자료수집 및 윤리적 고려

본 연구는 연구대상자 보호를 위해 경북대학교 생명윤리심의위원회 승인을 받은 후 승인된 범위 안에서 자료를 수집하였다(승인번호 KNU-2021-0104). 자료수집은 2021년 8월 2일부터 2021년 8월 27일까지 4주에 걸쳐 설문조사를 실시하였다. COVID-19 관련하여 대면접촉을 최소화하기 위해 영업소에 연구대상모집 안내문을 부착한 후 연구 희망을 원하는 사람에 한해 설문을 실시하였다. 대구·경북에 소재하는 택배회사 중 영업소 소장에게 유선상으로 연구의 목적과 필요성에 대해 설명한 후 연구에 관심을 보이는 영업소에 가서 연구대상모집 안내문을 부착하고 소장에게 연구 협조를 요청하였다. 참여자에게 연구에 대한 목적과 방법, 준수사항, 이익 및 잠재적 위험, 익명성과 비밀보장에 대해 설명한 후, 연구

참여 동의서에 스스로 서면으로 동의한 대상자에게 설문지를 배부하였다. 연구대상자는 연구 참여를 원하지 않을 시에는 언제든지 중단할 수 있음을 설명하였고 설문 문항이 이해가 되지 않을 시에는 언제든지 연구자에게 연락 가능함을 설명하였다. 완성된 설문지는 연구자가 직접 수거 후. 코딩화 작업 및 자료 입력을 하였으며 유출되지 않게 보관하였다. 설문은 15-20분 정도 소요되었으며 설문이 끝난 후 소정의 상품권을 지급하였다.

5. 자료분석

수집된 자료는 IBM SPSS 23.0과 AMOS 22.0을 이용하여 분석하였다. 대상자의 일반적 특성은 서술적 통계, 연구변수의 정규성 검증은 평균, 표준편차, 왜도, 첨도를 측정하였다. 연구 변수 간의 상관관계는 피어슨 상관 계수(Pearson correlation coefficient)로 분석하였고, 다중공선성은 공차(Tolerance)와 분산팽창지수(Variance Inflation Factor, VIF)로 확인하였다. 잠재변수와 측정변수와의 관계와 잠재변수와의 관계를 알아보기 위하여 확인적 요인분석을 실시하였다. 가설적 모형의 적합도는 χ^2, χ^2/df, SRMR(Standardized Root Mean Square Residual), RMSEA(Root Mean Square Error of Approximation), TLI(Turker-Lewis Index), CFI(Comparative Fit Index)를 산출하였다. 연구변수들의 직접, 간접, 총효과의 통계적 유의성은 Bootstrapping 방법으로 확인하였다.

연구결과

1. 대상자의 일반적 특성

본 연구대상자의 일반적 특성은 다음과 같다. 평균 연령은 47.26세로 50-59세가 51.5%(135명)로 가장 많았으며 40-49세가 30.5%(80명) 순이었고, 성별은 남자가 98.5%(258명)으로 대부분을 차지하였다. 결혼 상태는 기혼이 90.5%(237명), 학력은 고등학교 졸업이 48.1%(126명)로 가장 많았고 그 다음으로 대학교 이상 졸업이 45.8%(120명)로 나타났다. 평균 근무경력은 7.39년으로 6-10년이 48.9%(128명)로 가장 많았고 고용형태는 특수형태 근로종사자가 73.3%(192명), 평균 주당 근무시간은 67.15시간으로 52시간 이상이 90.1%(236명)을 차지하였다(Table 1).

2. 측정변수의 서술적 통계와 정규성

본 연구의 서술적 통계값은 근로환경 평균 116.60점, 사회적 지지 41.87점, 건강증진행위 57.77점, 통합성 59.30점, 건강상태 99.42점으로 나타났다. 왜도와 첨도를 계산하여 정규성 충족 여부를 판단하였다. 왜도는 절대값 3, 첨도는 절대값 10 미만이면 정규분포에 근사하는 것으로 판단한다[20]. 본 연구에서 왜도의 범위는 –0.39~1.17, 첨도의 범위는 –0.64~2.10으로 기준을 모두 만족하여 구조방정식 모형을 분석하는데 문제가 없는 것으로 판단하였다(Table 2).

3. 가설모형의 적합도 검증

1) 측정변수의 확인적 요인분석

관측변수의 구성타당도 검증을 위해 확인적 요인분석을 실시하였다. 표준화된 요인부하량의 일반적인 기준은 .50 이상이어야 한다[20]. 잠재변수에서 측정변수로 가는 요인부하량은 .58에서 .93으로 기준에 부합하였다. 단, 건강증진행위에서 영양이 요인부하량이 .50 미만을 보여 제거하였다.

집중타당성(Convergent validity, CV)은 잠재변수를 측정하는 관측변수들의 일치성 정도를 나타내며[20] 이를 검증하기 위해서 평균분산추출(Average Variance Extracted, AVE)과 개념신뢰도(Construct Reliability, CR)를 확인하였다. AVE는 분산의 크기로 .50 이상이어야 하며, 계산을 통해 확인한 AVE는 .50에서 .79였다. CR은 잠재변수를 구성하는 관측변수 사이에 내적 일관성이 있는지 확인하는 것으로 .70 이상이면 양호하다. 계산한 CR은 .75에서 .92로 기준에 충족되어 집중타당성이 확보되었다고 볼 수 있다(Table 2).

2) 가설모형의 검증

구조방정식 모형분석에서 χ^2/df값은 일반적으로 3 이하면 수용할 만하고, RMSEA는 .08 이하, TLI와 CFI는 .90 이상이면 양호한 것으로 판단한다[20]. SRMR은 .05 이하면 매우 좋으며 .10 이하이면 수용할 만하다[28]. 본 연구에서는 χ^2/df=2.38, TLI=.91, CFI=.93, RMSEA=.07, SRMR=.08로 전반적으로 양호한 적합도로 분석되어 구조모형의 가설적 모형은 적합한 것으로 판단되었다.

Table 1. General characteristics of subjects (*N*=262)

Variables	Categories	n (%)
Age(yr)	30-39	23 (8.8)
	40-49	80 (30.5)
	50-59	135 (51.5)
	≥ 60	24 (9.2)
Gender	Male	258 (98.5)
	Female	4 (1.5)
Marital status	Single	25 (9.5)
	Married	237 (90.5)
Education	≤ Middle school	16 (6.1)
	High school	126 (48.1)
	≥ University	120 (45.8)
Working years	3≤ ~ < 5	90 (34.4)
	5≤ ~ < 10	128 (48.9)
	≥ 10	44 (16.8)
Employment Type	Special types	192 (73.3)
	Wage	70 (26.7)
Working time	40≤ ~ < 52	26 (9.9)
(hours/week)	≥ 52	236 (90.1)

Table 2. Descriptive Statistics of the Observed Variables (*N*=262)

Variables	Measured range	M ± SD	Skewness	Kurtosis	AVE	CR
Working environment	37-187	116.60 ± 18.19	1.17	2.10	.50	.75
Physical factors	4-28	11.27 ± 4.42	1.14	1.44		
Occupational stress	27-135	96.02 ± 14.97	0.76	0.94		
Emotional labor	6-24	15.17 ± 3.57	0.90	2.03		
Social support	12-60	41.87 ± 9.50	-0.01	-0.15	.71	.88
Meaningful others	4-20	13.59 ± 3.59	-0.08	-0.30		
Family	4-20	14.80 ± 3.47	-0.39	0.12		
Friend	4-20	13.47 ± 3.63	-0.10	-0.18		
Health promotion activities	21-84	57.77 ± 9.05	1.06	1.27	.51	.84
Self-realization	6-24	17.73 ± 2.97	0.40	0.10		
Responsibility for health	3-12	7.94 ± 1.72	0.74	0.51		
Exercise	3-12	7.55 ± 2.13	0.53	0.33		
Support for interpersonal relationships	5-20	13.89 ± 2.61	0.58	0.03		
Stress management	4-16	10.68 ± 2.11	0.34	0.79		
Sense of coherence	7-91	59.30 ± 13.27	0.73	-0.55	.79	.92
Comprehensibility	5-35	22.53 ± 5.69	0.19	-0.64		
Manageability	4-28	18.51 ± 4.06	0.83	-0.38		
Meaningfulness	4-28	18.26 ± 4.56	0.79	-0.42		
Health status	27-135	99.42 ± 11.16	0.22	0.10	.51	.75
Physical health status	10-50	36.42 ± 5.82	-0.23	0.76		
Mental health status	7-35	26.82 ± 3.56	-0.06	-0.25		
Social health status	10-50	36.18 ± 4.39	0.30	0.97		

AVE = average variance extracted; CR = construct reliability.

4. 가설모형의 효과 분석

총효과에서 건강상태에 가장 큰 영향을 주는 변수는 통합성(β = .59, p = .002), 건강증진행위(β = .39, p < .001), 근로환경(β = .32, p < .001), 사회적 지지(β = .30, p < .001) 순으로 나타났다. 건강상태에 대한 이들 변수의 설명력은 62.3%였다. 통합성에 영향을 주는 변수는 건강증진행위(β = .34, p < .001), 사회적 지지(β = .24, p = .011) 근로환경((β = .20, p = .007) 순으로 나타났다. 통합성에 대한 이들 변수의 설명력은 21.2%였다(Figure 2, Table 3).

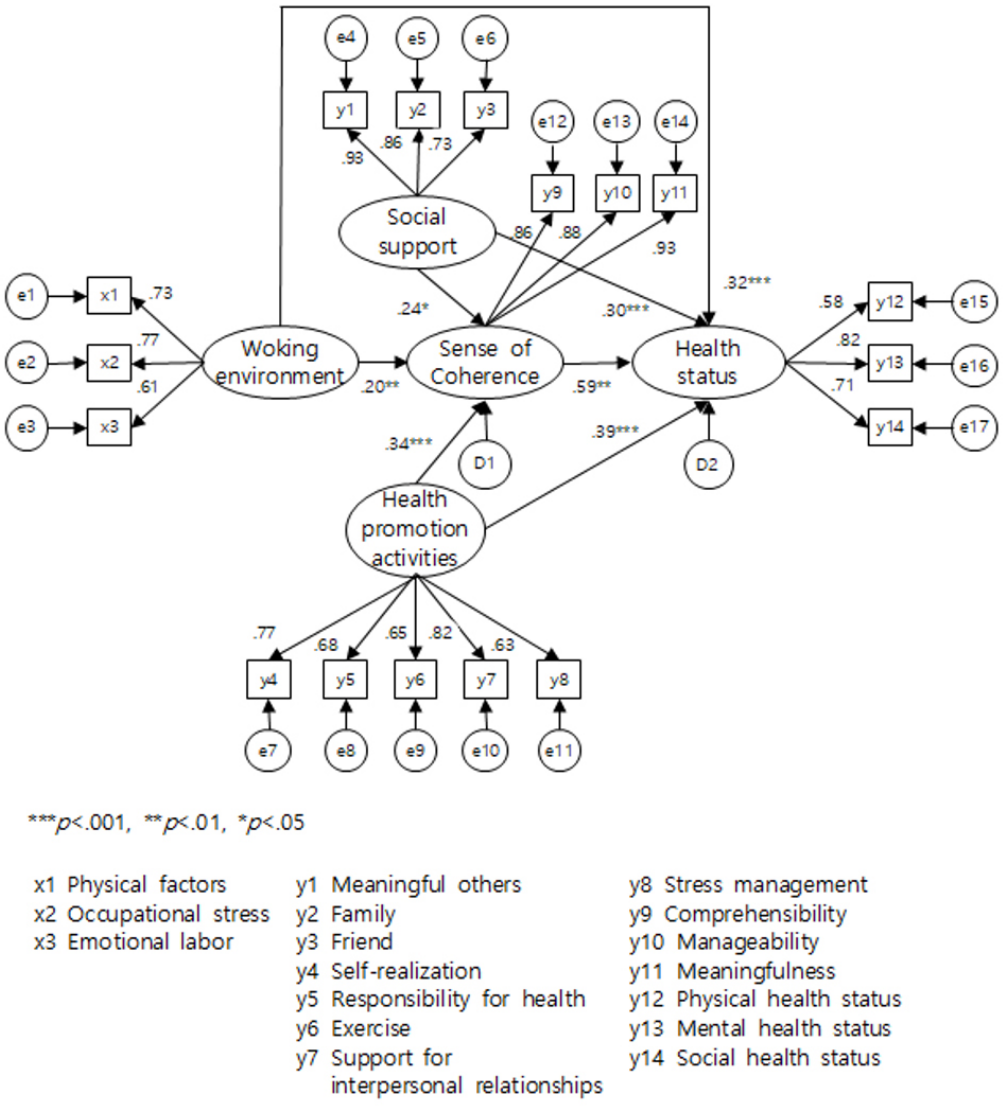
직접효과에서 통합성(β = .59, p = .002), 근로환경(β = .21, p < .001), 건강증진행위(β = .19, p = .011), 사회적 지지(β = .16, p = .010) 순으로 건강상태에 유의한 직접효과가 있는 것으로 나타났다. 건강증진행위(β = .34, p < .001), 사회적 지지(β = .24, p = .011) 근로환경((β = .20, p = .007)은 통합성에 유의한 직접효과가 있었다.

간접효과에서 근로환경은 건강상태에 유의한 간접효과가 있었고(β = .12, p = .007) 근로환경은 통합성를 매개로(β = .12, p < .001) 건강상태에 영향을 주었다. 사회적 지지는 건강상태에 유의한 간접효과가 있었고(β = .14, p = .010) 사회적 지지는 통합성을 매개로(β = .14, p < .001) 건강상태에 영향을 주었다. 건강증진행위는 건강상태에 유의한 간접효과가 있었고(β = .20, p < .001) 건강증진행위는 통합성을 매개로(β = .20, p < .001) 건강상태에 영향을 주었다. 근로환경, 사회적 지지, 건강증진행위는 통합성을 통해 건강상태에 간접적인 영향을 미쳤으므로 건강상태에 미치는 영향에서 통합성은 부분매개 역할을 한다.

논의

본 연구는 택배기사의 건강상태를 규명하기 위하여 Antonovsky [14,15]의 건강생성이론을 기반으로 건강모형을 구축하고 검증하였다. 이론을 근거로 건강상태에 영향을 미치는 변인으로 스트레스원은 물리적 요인, 직무스트레스, 감정노동으로 하였으며, 일반적 저항자원은 사회적 지지와 건강증진행위, 그리고 통합성과 건강상태를 설정하여 가설적 모형을 구축하였다.

본 연구에서 택배기사의 건강상태를 예측하는 가장 강력한 변인은 통합성으로, 통합성은 건강상태에 직접적인 영향과 함께 간접적인 매개요인으로도 작용하였다. 택배기사의 통합성이 높을수록 건강상태가 좋았는데 이는 통합성이 높은 군은 낮은 군에 비해 주관적 건강상태가 좋았고[29] 통합성은 건강과 유의한 상관관계가 있다는 선행연구를 지지하였다[15,27,30]. 통합성이 높은 사람은 주어진 상황을 잘 이해하고 스트레스를 덜 받으며 직면한 스트레스 요인을 처리하기 위하여 사용가능한 자원을 잘 활용한다[15,31]. 또



***p<.001, **p<.01, *p<.05

x1 Physical factors
x2 Occupational stress
x3 Emotional labor

y1 Meaningful others
y2 Family
y3 Friend
y4 Self-realization
y5 Responsibility for health
y6 Exercise
y7 Support for interpersonal relationships

y8 Stress management
y9 Comprehensibility
y10 Manageability
y11 Meaningfulness
y12 Physical health status
y13 Mental health status
y14 Social health status

Figure 2. Path diagram of hypothetical model.

Table 3. Standardized Estimates, Direct, Indirect and Total Effect of the Hypothetical Model

Exogenous variables		Endogenous variables	Direct effect		Indirect effect		Total effect		SMC
			β	*p*	β	*p*	β	*p*	
Working environment	→	Sense of coherence	.20	.007	-		.20	.007	.21
Social Support	→	Sense of coherence	.24	.011	-		.24	.011	
Health promotion activities	→	Sense of coherence	.34	< .001	-		.34	< .001	
Working environment	→	Health status	.21	< .001	.12	.007	.32	< .001	.62
Working environment → Sense of coherence	→	Health status	-		.12	< .001	-		
Social Support	→	Health status	.16	.010	.14	.010	.30	< .001	
Social Support → Sense of coherence	→	Health status	-		.14	< .001	-		
Health promotion activities	→	Health status	.19	.011	.20	< .001	.39	< .001	
Health promotion activities → Sense of coherence	→	Health status	-		.20	< .001	-		
Sense of coherence	→	Health status	.59	.002	-		.59	.002	

SMC = squared multiple correlations.

한 통합성은 건강을 예측하는 주요 인자로써 일반적 저항자원을 정확히 알고 강화함으로써 통합성을 높일 수 있다고 하였다[16]. 본 연구에서는 통합성이 건강상태에 가장 큰 영향요인으로 나타났는데 이는 택배기사의 스트레스 관리 및 건강증진을 위하여 통합성이 가장 적합한 요인임을 나타낸다. 이러한 통합성은 스트레스가 많고, 열악한 근로환경에 처한 택배기사의 직업적 문제들을 대처할 때 능동적으로 극복할 수 있도록 하는 중요한 내적 자원으로 사료된다. 택배기사들의 내적 역량을 높이기 위하여 통합성을 잘 활용할 수 있는 사회적 지원이 요구된다.

본 연구에서 택배기사의 근로환경은 통합성에 직접적인 영향을 주었고, 통합성을 거쳐 건강상태에 간접적인 영향도 주었다. 이는 근로환경이 안 좋을수록 통합성이 감소하였다는 Nielse, Matthiesen과 Einarsen [32]의 연구결과와 일치하였다. 통합성은 유전적 능력이 아니라 경험에 의해 생성되는 후천적 자질로 근로환경의 변화에 따라 바뀌는 것으로 알려져 있다[15,33]. 또한 통합성이 높으면 스트레스에 대한 대처능력이 좋아져 좋은 건강상태를 유지할 수 있는데[29], 통합성은 다양한 스트레스 상황에 직면할 때 대처법과 그 반응에 영향을 준다고 하였다[34]. 즉, 통합성은 개인의 긴장 상태인 스트레스를 관리하고 이를 일반적 저항자원과 함께 적절하게 대처함으로써 효과적인 스트레스 관리법으로 사용된다[14,15]. 또한 택배기사의 근로환경과 건강상태와의 관계에서 통합성의 통계적으로 유의한 매개효과는 직무스트레스와 심리적환경이 통합성을 매개로 건강상태에 영향을 준 선행연구의 결과와 일치하였고[27] 통합성이 매개역할을 하여 주관적 건강상태를 높여준다는 선행연구의 결과를 지지하였다[35].

통합성을 향상시키기 위해 통합성의 세 가지 영역을 고루 발달시키는 것이 중요한데, 인지적 요소인 이해력을 강화하기 위해 택배기사의 전반적인 근로환경에 대한 인식과 도움이 필요할 때 상담가능한 곳의 정보제공 등을 해주도록 한다. 이러한 정보제공은 불확실한 미래에 대한 이해력을 높여주는데 도움을 준다[36]. 도구적 요소인 관리력을 강화하기 위해 평소 건강관리를 잘 할 수 있도록 음주, 금연, 식습관 등에 관한 교육 제공과 함께 건강관련 상담을 실시하여 일상생활을 관리하는 방법을 제공하도록 한다. 마지막으로 동기적 요인인 의미부여를 강화하기 위해 자조모임과 그룹 커뮤니티와 같은 지지자원을 구축할 수 있도록 도와줌으로써[37] 택배기사의 통합성 향상을 위해 노력하여야 할 것이다.

최근 다양한 분야에서 일반적 저항자원을 강화시켜 통합성을 증진시키는 통합성 증진 프로그램을 시행하고 있으며 프로그램 적용 후 직무스트레스 완화 및 건강행위 개선에 영향을 주는 것으로 나타났다[38]. 스트레스가 높은 근로환경 속에서 건강한 삶의 질을 유지하기 위하여 근로자 교육 시 건강생성이론을 적용하고 이를 기반으로 산업간호사는 지지적 상담, 스스로 스트레스원을 확인하고 능동적으로 전략을 수립하도록 하는 간호중재를 제공하여야 할 것이다. 또한 택배기사는 일반적인 근로자와 달리 특수형태 근로자 비율이 높아 직장에서의 지지체계가 미약하고 주기적인 안전보건교육 대상이 아니라 안전보건에 대한 의무가 없어 보통의 사업장에서 수행하는 근로자 건강관리 프로그램과는 다른 전략이 필요할 것이다. 택배기사마다 전담하는 구역의 특성에 따른 업무강도 등을 고려하여 개개인에 맞는 건강 프로그램 적용이 필요하다. 즉, 특수형태 근로종사자와 같이 특수성을 가진 근로자에게도 적용할 수 있는 적합한 중재 프로그램을 개발하고 적용함으로써 건강의 사각지대에 있는 특수형태 근로자의 건강증진을 위하여 노력해야 할 것이다.

택배기사의 사회적 지지가 좋을수록 건강상태가 좋은 것으로 나타났다. 이러한 결과는 사회적 지지가 건강상태와 유의한 상관관계가 있다는 선행연구와 일치하였다[39]. 사회적 지지는 정신건강을 예측하는 요인이고 심리사회적 안녕에 긍정적인 영향을 준다[40]. 택배기사는 대부분 특수형태 근로종사자로 근로자와 동일한 수준으로 보호받지 못하고 있으며 사회적 지지체계도 열악하다. 택배기사의 사회적 지지를 높이기 위해 근로조건 개선 및 조직차원의 프로그램을 개발하는 등의 적극적인 노력이 필요하다. 또한 택배기사의 사회적 지지는 통합성에 직접적인 영향을 주었고, 통합성을 거쳐 건강상태에 간접적인 영향도 주었다. 택배기사의 사회적 지지는 통합성에 영향을 주었는데 이러한 결과는 사회적 지지가 높을수록 통합성이 높다는 선행연구 결과와 일치하였다[27]. 또한 택배기사의 사회적 지지와 건강상태와의 관계에서 통합성의 매개효과가 유의하였다. 사회적 지지가 통합성을 매개하여 건강상태에 영향을 준 것으로 나타난 본 연구결과는 택배기사의 사회적 지지가 통합성에 영향을 주어 결과적으로 건강상태에 긍정적인 영향을 미치는 것으로 볼 수 있다. 캐나다 전국 인구 건강조사 데이터에 관한 연구에 의하면 사회적 지지는 통합성에 긍정적인 영향을 주었고, 어린 시절 스트레스 요인을 경험한 사람들에게 성인기에 양질의 사회적 지지를 제공하면 스트레스의 완충작용으로 통합성에 영향을 주며 건강에도 유익한 영향을 준다는 결과와 일치하였다[31].

택배기사의 건강증진행위가 좋을수록 건강상태가 좋은 것으로 나타났다. 이는 시멘트회사 근로자를 대상으로 한 선행연구의 결과와 일치하였다[41]. Breslow와 Enstrom [42]의 연구에서 수면, 음주, 흡연, 운동, 규칙적인 식사 및 간식 여부 등의 건강행위를 건강상태 관련 요인으로 제시하였고 Kim 등[43]의 연구에서 운동프로그램 참가자의 스트레스 관리, 대인관계 지지 등의 건강증진행위는 삶의 질에 긍정적인 영향을 주었다. 건강을 유지·증진시키며 질병을 예방하기 위한 건강증진행위는 근로자 개개인의 기본적인 건강요구를 해결해 삶의 질을 증진시킬 뿐 아니라 궁극적으로 산업장의 생산성을 극대화할 수 있다[44]. 사업장에서는 흡연, 음주, 운동. 스트레스 등과 같은 건강증진행위 교정을 위한 건강증진 프로그램을 진행함으로써 근로자의 건강과 생산성 향상을 도모할 수 있을 것으로 사료된다. 택배기사의 건강증진행위는 통합성에 직접적인 영향을 주었고, 통합성을 거쳐 건강상태에 간접적인 영향도 주었다. 이는 건강증진행위를 잘하면 통합성이 높아지고, 결과적으로 높아진 통

합성이 건강상태를 증진시킨다는 것을 의미한다. 선행연구에서 개인이 건강한 행동을 추구하는데 있어 통합성이 중요한 요인으로 작용하였고[45] 음주, 흡연, 운동. 식생활과 같은 개별적 건강증진행위는 통합성과 유의미한 상관관계가 있었다[30]. 스트레스를 건강하게 대처하고 조절할 수 있는 건강관련행위의 이해와 이에 따른 교육이 이루어져야 할 것이다. 그리고 근로자 개인에게 초점을 두어 근로자 스스로 건강증진행위를 실천할 수 있도록 도움을 주면서 사업장 차원에서 개인의 건강증진행위를 돕는 행정적 지원방안들이 강구되어야 할 것이다.

마지막으로 택배기사의 근로환경은 건강상태에 영향을 주었다. 이는 유해작업환경과 직무스트레스가 근로자의 육체적, 정신적 건강에 직접적인 영향을 주는 선행연구의 결과를 지지하였다[46]. 이러한 연구결과는 택배기사의 건강수준을 높이기 위해 저항자원과 통합성을 적절히 사용하여 건강생성을 유도하면서 스트레스원인 근로환경을 적극적으로 개선하는 것이 필요하다.

위의 내용을 종합해보면, 본 연구에서 택배기사의 건강상태에 가장 큰 영향을 미치는 요인은 통합성이었으며, 근로환경과 일반적 저항자원인 사회적 지지와 건강증진행위는 통합성을 매개로 건강상태에 영향을 주었다. 이는 건강생성이론의 핵심인 통합성이 스트레스 조절에 중요한 역할을 하며, 일반적 저항자원은 통합성과 함께 건강상태에 영향을 준다는 건강생성이론을 지지함을 의미한다[14,15]. 따라서 건강생성이론을 기반으로 한 택배기사의 건강증진 방향은 그 핵심요인인 일반적 저항자원과 통합성의 특성을 이해하고, 적극적인 저항자원의 활용과 더불어 통합성의 증진이 택배기사의 건강상태를 개선하는 데 많은 도움이 될 것으로 기대된다.

본 연구는 검증된 건강생성이론을 바탕으로 근로환경이 열악한 택배기사의 건강과 관련된 요인을 검증하고 이들 변수와의 관계를 확인함으로써 스트레스원과 일반적 저항자원, 통합성, 그리고 건강상태와의 관계에 대한 이론적 기틀을 제공하였다. 기존에 시도한 적이 없는 건강생성이론을 기반으로 택배기사의 건강상태에 있어서 근로환경, 일반적 저항자원인 사회적 지지와 건강증진행위, 매개변수인 통합성 간의 관계에 대한 이론적 개념을 규명하고 모형을 설정함으로써 각 변수들 간의 구조적 관계를 확인하였다. 본 연구에서 검증된 모형을 바탕으로 택배기사의 건강상태에 미치는 영향요인을 체계적으로 이해하였으며, 택배기사의 건강증진을 위하여 사회적 지지, 건강증진행위, 통합성은 중재 프로그램 개발에 중요한 개념으로 활용할 수 있을 것이다. 또한 택배기사의 건강상태에 영향을 미치는 변수들의 관계를 확인함으로써 산업간호사는 택배기사가 스트레스를 성공적으로 대처하여 건강을 유지·증진할 수 있도록 중재하는데 도움을 줄 것이다. 택배기사를 대상으로 건강을 증진시킬 수 있는 효과적인 중재 전략에 대한 근거자료를 제공함으로써 일반적 저항자원과 통합성을 높일 수 있는 택배기사의 통합성 증진 프로그램을 개발하여 중재하는데 긍정적으로 기여할 수 있을 것으로 사료된다.

본 연구는 단면연구로 택배기사의 건강상태 관련 요인의 선후관계를 분명히 알 수 없고 인과관계가 아닌 관련성에 대한 정보만 제공한다. 또한 실제 필요한 대상자 수보다 적은 수를 대상으로 연구를 진행하였기 때문에 연구결과가 과다 또는 과소 추정될 가능성이 있다. 따라서 충분한 표본 수를 확보하여 재확인 할 필요가 있다. 마지막으로 본 연구는 대구·경북의 택배기사를 대상으로 하였으므로 결과 해석 시 일반화에 제한이 있어, 택배 물량이나 지역을 고려한 반복 연구를 제언한다.

결론

본 연구는 택배기사 262명을 대상으로 Antonovsky의 건강생성이론[14,15]을 기반으로 택배기사의 건강상태 영향요인의 구조적 관계를 파악하기 위해 모형을 구축하고 검증하였다. 건강상태를 예측하는 외생변수로는 근로환경, 사회적 지지, 건강증진행위였고, 내생변수는 통합성과 건강상태였다. 모형 적합도는 TLI .91, CFI .93으로 수용가능한 수준이었다. 가설적 모형에서 제시하였던 10개의 경로 중 10개 경로 모두가 통계적으로 유의하게 나타났다. 근로환경, 사회적 지지, 건강증진행위는 통합성에 직접적인 영향을 주었고 설명력은 21.2%였다. 근로환경, 사회적 지지, 건강증진행위, 통합성은 건강상태에 직접적인 영향을 주었고 근로환경, 사회적 지지, 건강증진행위는 통합성을 매개로 건강상태에 간접적인 영향도 주었으며 설명력은 62.3%였다. 건강상태에 가장 큰 영향을 주는 요인은 통합성으로 확인되었다.

연구결과, 택배기사의 건강을 증진시키기 위하여 근로환경 개선과 함께 통합성을 높이기 위한 방안이 마련되어야 할 것이며, 사회적 지지와 건강증진행위를 통해서 통합성을 높일 수 있는 효과적인 프로그램이 개발되어야 할 것이다.

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Conflict of interest

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Authors' contributions

Kim, Min Ji contributed to conceptualization, data curation, writing – original draft, review & editing, and investigation. Choi, Eun Suk contributed to methodology, supervision, and validation.

Data availability

Please contact the corresponding author for data availability.

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References

1. Korea Integrated Logistics Association. Daily Logistics Statistics [Internet]. Seoul: Korea Integrated Logistics Association. 2021 [cited 2022 October]. Available from: https://www.nlic.go.kr/nlic/parcelServiceLogistics.action
2. Statistic Korea. REPORT ON THE TRANSPORTATION SURVEY. Statistic report. Daejeon: Statistic Korea; 2022 June. Report No.: 11-1240000-000112-10.
3. Baek HH, Jeon YI, Jo HH, Choi YH. Policy Measures to Prevent Health Problems and Death Caused by Overworks of Couriers. Research Report. Ulsan: Occupational Safety & Health Research Institute; 2020 October. Report No.: 2020-Occupational Safety & Health Research Institute-685.
4. Shin TJ, Lee JH. Current status of the parcel delivery business and labor conditions of parcel delivery drivers. Research Report. Seoul: Seoul Labor Center; 2017 November. Report No.: Trends and issues 2017-02.
5. Lee YJ. A convergence study on working conditions and health related factors influencing well-being in door to door deliverers. Journal of the Korea Convergence Society. 2019;10(1):329–338. https://doi.org/10.15207/JKCS.2019.10.1.329
6. Jung MS, Kim HL, Lee YJ. Factors influencing work-life balance in Korean registered nurses. Korean Journal of Occupational Health Nursing. 2017;26(2):114–123. http://doi.org/10.5807/kjohn.2017.26.2.114
7. Lee BI. Working conditions and health status of delivery workers. Korean Journal of Occupational Health Nursing. 2019;28(3):156–165. https://doi.org/10.5807/kjohn.2019.28.3.156
8. Yi SJ, Cho MS. Low back pain and related factors in drivers of delivery home service. Journal of Korean Society for Hygienic Science. 2004;10(1):65–72.
9. Choi ES, Joo YS, Jo SJ, Lee SU. A Study of Health Management for Workers in Special Types of Employment. Research Report. Ulsan: Occupational Safety & Health Research Institute; 2018 October. Report No.: 2018-Research Institute-794.
10. Park YJ, Baik S, Choi Y, Shin H, Moon S, Khim S. The relation or trait anger and anger expression to cardiovascular response and depression in middle-aged Korean women. Journal of Korean Academy Nursing. 2005;35(7):1371–1378. https://doi.org/10.4040/jkan.2005.35.7.1371
11. Jang SJ, Kang HT, Koh SB, Kim IA, Kim HR, Oh SS, et al. Improvement and utilization of Questionnaire for Korean Emotional Laborer. Ulsan: Occupational Safety & Health Research Institute; 2018 October. Report No.: 2018-Research Institute-790.
12. Park KO. Characteristics of social support at work affecting work stress. Korean Journal of Health Education and Promotion. 2003;20(3):91–108.
13. Kristensen TS, Hannerz H, Høgh A, Borg V. The copenhagen psychosocial questionnaire - A tool for the assessment and improvement of the psychosocial work environment. Scandinavian Journal of Public Health, Environment & Health. 2005;31(6):438–449. https://doi.org/10.5271/sjweh.948
14. Antonovsky A. Health, Stress and Coping. San Francisco CA: Jossey-Bass Publishers; 1979.255 p.
15. Antonovsky A. Unraveling The Mystery of Health. How People Manage Stress and Stay Well. San Francisco CA: Josey-Bass Publishers; 1987.238 p.
16. Antonovsky A. Salutogenesis. Kong ES, translator. Seoul: Hakjisa Medical; 2019.
17. Kim MS, Choi ES. Differences in the working environment and health outcomes according to the employment type of delivery workers. Korean Journal of Occupational Health Nursing. 2020;29(4):316–324. https://doi.org/10.5807/kjohn.2020.29.4.316
18. Super S, Wagemakers MAE, Picavet HSJ, Verkooijen KT, Koelen MA. Strengthening sense of coherence: Opportunities for theory building in health promotion. Health Promotion International. 2015;31(4):869–878. https://doi.org/10.1093/heapro/dav071
19. Oh DS. Factor Analysis of door-to-door delivery service men's

job stress [master's thesis]. [Seoul]: Konkuk University; 2010. 79 p.
20. Yu JP. The Basics and interpretation of structural equation modeling. Seoul: Hannarae; 2016.568 p.
21. Koh JJ. The 5th Working Environment Survey Original Data User Manual. Research Report. Ulsan: Occupational Safety & Health Research Institute; 2017 November. Report No.: 2017-Research Institute-989.
22. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The Multidimensional scale of perceived social support. Journal of Personality Assessment. 1998;52(1):30–41. https://doi.org/10.1207/s15327752jpa5201_2
23. Shin JS, Lee YB. The effects of social supports on psychosocial well-bing of the unemployed. Korean Journal of Social Welfare. 1999;37:241–269.
24. Walker SN, Sechrist KR, Pender NJ. The health-promoting lifestyle profile: Development and psychometric characteristics. Nursing Research. 1987;36(2):76–81. https://doi.org/10.1097/00006199-198703000-00002
25. Jeon EY, Choi SR, Han SS. Influencing factors on health-promotion lifestyle of nuses. Journal of East-West Nursing Research. 2007;13(1):40–47.
26. Kim KS, Choi Sm, Han KH. Structural equation modeling on health status in hospital nurses: Based on the theory of salutogenesis with bio behavioral approach. Journal of Korean Biological Nursing Science. 2015;17(1):50–59. https://doi.org/10.7586/jkbns.2015.17.1.50
27. BLim HJ. Factors affecting the health status of dental hygienist based on theory of salutogenic [dissertation]. [Seoul]: Ewha Womans University; 2017.93 p.
28. Noh KS. The proper methods of statistical analysis for dissertation: SPSS & AMOS 21. Seoul: Hanbit Academy Inc; 2019.372 p.
29. Richardson CG, Ratner PA. Sense of coherence as a moderator of the effects of stressful life events on health. Journal of Epidemiology and Community Health. 2005;59(11):979–984. http://doi.org/10.1136/jech.2005.036756
30. Wainwright NWJ, Surtes PG, Welch AA, Luben RN, Khaw KT, Bingham SA. Healthy lifestyle choices : Could sense of coherence aid health promtion? Journal of Epidemiology and Community Health. 2007;61(10):871–876. http://doi.org/10.1136/jech.2006.056275
31. Wolff AC, Ratner PA. Stress, social support and sense of coherence. Western Journal of Nursing Research. 1999;21(2):182–197. https://doi.org/10.1177/01939459922043820
32. Nielsen MB, Matthiesen SB, Einarsen S. Sense of coherence as a protective mechanism among targets of workplace bullying. Journal of Occupational Health Psychology. 2008;13(2):128–136. https://doi.org/10.1037/1076-8998.13.2.128
33. Feldt T, Leskinen E, Kinnunen U, Mauno S. Longitudinal factor analysis models in the assessment of the stability of sense of coherence. Personality and Individual Differences. 2000;28(2):239–257. https://doi.org/10.1016/S0191-8869(99)00094-X
34. McSherry WC, Holm JE. Sense of coherence its effects on psychological and physiological processes prior to, during, and after a stressful situation. Journal of Clinical Psychology. 1994;50(4):476–487. https://doi.org/10.1002/1097-4679(199407)50:4%3C476::aid-jclp2270500402%3E3.0.co;2-9
35. Kivimäki M, Elovainio M, Vahtera J, Nurmi JE, Feldt T, Liisa Keltikangas-Järvinen, et al. Sense of coherence as a mediator between hostility and health: Seven-year prospective study on female employees. Journal of Psychosomatic Research. 2002;52(4):239–247. https://doi.org/10.1016/s0022-3999(01)00305-1
36. Landsvek SS, Kane CF. Antonovsky's sense of coherence: Theoretical basis of psycho education in schizophrenia. Issues in Mental Health Nursing. 1998;19(5):419–431. https://doi.org/10.1080/016128498248872
37. Yun JM. The Effect of Sense of Coherence Enhancement Program Based on Salutogenesis for Elderly with Metabolic Syndrome [dissertation]. [Busan]: Pusan National University; 2018. 208 p.
38. Moon JH. Sense of Coherence (SOC) Promotion Program for Preventing Cadiocerebrovascular Disease of Office Workers – On the Basis of Salutogenesis - [dissertation]. [Seoul]: Korea University; 2020. 169 p.
39. Jeon SY. The relationship between social support, health status, college adjustment and academic achievement in college students. The Journal of Korean Society for School & Community Health Education. 2010;11(1):93–115.
40. Lerdal A, Andenæs R, Bjørnsborg E, Bonsaksen T, Borge L, Christiansen B, et al. Personal factors associated with health-related quality of life in persons with morbid obesity on treatment waiting lists in Norway. Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation. 2011;20(8):1187–1196. https://doi.org/10.1007/s11136-011-9865-z
41. Lee SH, Chon MY. Health promotion behavior of the labor workers at the cement manufacturing company. Korean Journal of Health Education and Promotion. 2004;21(3):35–51.

42. Breslow L, Enstrom JE. Persistence of health habits and their relationship to mortality. Preventive Medicine. 1980;9(4):469–483. https://doi.org/10.1016/0091-7435(80)90042-0
43. Kim YM, Hyeon SH, Song HS. The relationship among health status, health promoting behavior, depression and quality of life of health program particpants. Korean Journal of Leisure, Recreation & Park. 2008;32(4):33–46.
44. Oh SW, Jung KT, Park JY. The association of health risks with absenteeism and presenteeism. Annals of Occupational and Environmental Medicine. 2007;19(4):304–314. https://doi.org/10.35371/kjoem.2007.19.4.304
45. Javtokas Z, Lindström B, Zagminas K. Sense of coherence and awakening pattern: Evidence from the population survey in Lithuania. Public Health. 2004;3(26):46–50.
46. Kim JH, Chang SJ. The relation between job stress and health problem according to working condition. Health and Social Science. 2012;31:5–24.

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7) Any addition, deletion, or rearrangement of author names in the authorship list should only be made prior to acceptance of the manuscript and only if approved by the Editor. To request such a change, the Editor must receive the following from the corresponding author: (a) the reason(s) for the change in the author list; (b) written confirmation (e-mail, letter) from all authors that they agree with any addition, removal, or rearrangement. In the case of the addition or removal of authors, this includes a requirement for confirmation from the author being added or removed. Only in exceptional circumstances will the Editor consider the addition, deletion, or rearrangement of authors after the manuscript has been accepted. While the Editor considers the request, the publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

4. Redundant publication and plagiarism

1) Redundant publication (duplication) is defined as "reporting (publishing or attempting to publish) substantially the same work more than once, without attribution of the original source(s)." Characteristics of reports that are substantially similar include the following: (a) "At least one of the authors must be common to all reports (if there are no common authors, it is more likely plagiarism than redundant publication);" (b) "The subjects or study populations are the same or overlapped;" (c) "The methodology is typically identical or nearly so;" (d) "The results and their interpretation generally vary little, if at all."

2) Authors should not submit the same research to more than one journal and should not publish the manuscript in different languages. If authors wish to pursue a secondary publication of

the manuscript in another language, they should obtain approval from the editor-in-chief of both related journals. The editorial board will determine the nature and degree of duplicate publication or duplicate submission for the manuscript.

3) Plagiarism means the appropriation of another person's ideas, research processes, results, or text as one's own. This includes using previously published material of oneself or any other author without citing the reference. Authors are required to submit original manuscripts and confirm that they have cited or quoted others' ideas and texts appropriately and accurately.

5. Process for managing publication malpractice

1) When reviewers or readers suspect publication malpractice, such as fabrication, falsification, salami slicing, plagiarism, or simultaneous/ duplicate publication, inappropriate changes in authorship, an undisclosed conflict of interest, ethical problems with a submitted manuscript, a reviewer who has appropriated an author's idea or data, and complaints against editors, the process of resolution will be initiated according to the flowchart provided by the Committee on Publication Ethics (COPE, http://publicationethics.org/resources/flowcharts).

2) The ethics committee will discuss and adjudicate cases of suspected publication malpractice, as well as complaints and appeals against editors.

3) If an author violates the aforementioned research and publication ethics, the editorial board will decide specific penalty, including the prohibition of making contributions for two years.

Manuscript submission

1. The first author and corresponding author should be a member, with the exception of non-Korean authors. The Society permits both members and nonmembers to submit manuscripts, but nonmembers shall only be allowed to submit in the following cases:
   1) When a nonmember is in joint research with a member of the Society,
   2) When a nonmember has received a recommendation from the director of this Society.
2. Only research papers, reviews, and editorials are considered for review and manuscripts that do not adhere to the submission regulations shall not be accepted.

3. All manuscripts shall be submitted online.

1) All manuscripts may be submitted at any time through the Korean Academy of Community Health Nursing website. Reviews shall be processed on a first-come-first-served basis.

2) For any questions regarding the use of the online submission system, please contact the publication director of the Society via e-mail (rcphnoffice@gmail.com).

4. Types of Publication

1) Research Papers: The RCPHN publishes original research that matches the aims and scope of the journal. These include full papers reporting original research. These are reports of empirical findings from the highest quality basic and clinical research studies within the scope of focus of the RCPHN. The findings from studies utilizing diverse approaches are relevant. These include the following: qualitative methods; measurement, such as the development and evaluation of instrumentation; observational, quasi-experimental, and experimental studies; e-science, information-based studies; mixed-method designs. Research papers should adhere to recognized standards. Analysis by gender is recommended. Instrument development or validation papers are only considered if accompanied by a copy of the full instrument, included as a supplementary file at the submission stage, so it can be published as an appendix online if accepted.

2) Reviews: These include critical presentations of topics of interest and relevance to nursing theory, practice, and education. The body of a review article should be a comprehensive, scholarly, evidence-based review of the literature, accompanied by critical analysis, and leading to reasonable conclusions. The journal publishes systematic reviews (addressing focused research questions) and broader literature reviews (such as scoping reviews). We also publish discussion papers, which are scholarly articles of a debating or discursive nature. In all cases, there must be engagement with and critical analysis of a substantive body of research or other scholarship. Systematic reviews should adhere to recognized standards for reporting.

3) Editorials: These include comments by organizations or individuals on topics of current interest and are by invitation only. Authors with ideas for editorials that address issues of substantive concern to the discipline, particularly those of a controversial nature or linked directly to current/forthcoming content in the journal, should contact the editorial office.

4) Letters to the Editor: These include responses to previous articles and editorials. Designed to stimulate academic debate and discussion, the Editor invites readers to submit letters that refer to and comment on recent content in the journal, introduce

new comments and discussion of clear and direct relevance to the journal's aims and scope, or briefly report data or research findings that may not warrant a full paper.

Manuscript preparation

General guideline

1. The first author and co-author shall be addressed separately, and the affiliations and positions of the authors shall be indicated. The author addressed first becomes the first author, followed by the co-authors. The corresponding author shall be explicitly indicated. If the author is an elementary, junior, high school, or college student, it should be indicated that the author is a student and the school to which the author belongs. In the case of a minor who does not belong to a school, their last school, position, and school year shall be indicated.
2. Manuscripts shall be proofread by the author(s), and publication charges, special composing frames and supplementary documents shall also be prepared by the author (s) according to the regulations of the Society. The publication charges are 60,000 won (50 USD) per page.
3. Authors will be required to complete the Checklist during the submission process to assist them in ensuring that the basic requirements of manuscript submission are met, including details of the contribution of authors, funding sources, and any conflicts of interest. The Checklist is designed to be a self-assessment checklist to assist authors in preparing their manuscripts. A completed form must be submitted to show that have been included all the necessary parts in the submission have been included.

4. The procedures of manuscript submission are as follows.
   1) The title page and manuscript should be submitted in separate files.
   2) The authors' names can be omitted in the main text, and all pages shall be numbered.
   3) The manuscript shall be prepared in an A4 size page in word file, with a 1-inch margin on all sides. The font size shall be 12-point batang or 12-point Times New Roman. The line spacing shall be double-spaced or 200% for the title page, abstract, text, and references. The line spacing should be single-spaced or 100% for the tables, table titles and notes, and figure captions. The manuscript shall be within 20 pages, excluding the title page, abstract, references, and any supplemental digital contents.
   4) All manuscripts shall be written in Korean or English with correct spelling. The abstract, acknowledgments and references should be written in English. The abstract shall not exceed 250 words.
   5) English abbreviations should be placed in parenthesis after writing the full name, e.g., magnetic resonance imaging (MRI).
   6) Standard abbreviations and units must be used in accordance with the Citing Medicine: The NLM (National Library of Medicine) Style Guide for Authors Editors, and Publishers 2nd ed (2007).
   7) Even when submitted through the online submission system, only the manuscripts that fit the guidelines regarding the number of pages, order of contents, and organization shall be accepted.

Composition of manuscripts

1. The composition of manuscripts shall be in the following order: title page, title, abstract and keywords, main text (introduction, methods, results, discussion, and conclusion), references, tables, figures, appendix, and finally, a literature review if necessary. The composition may be different for special papers. The order of each section shall be I - 1 - 1) – or (1). In the main text (including references, figures, tables, and acknowledgments), the author's name or identification, such as the name of the institution or IRB, should not be written for anonymous peer review.

2. Title page
   On the title page include 1) title and running title, 2) type of manuscript, 3) authors' names and affiliations (department, location, and ORCID (visit https://orcid.org)), 4) corresponding author's name and complete address, including e-mail, phone number, ORCID, and fax number, 5) keywords (English and Korean), 6) contributor roles of each author, 7) any acknowledgments, credits, or disclaimers, including funding sources and conflicts of interest, Institutional Review Board statement, data-sharing statements, and registration of study.

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Authors are required to disclose any possible conflicts of interest when submitting a paper. These can include financial conflicts of interest, e.g., patent ownership, stock ownership, consultancies, speaker's fee. All conflicts of interest (or information specifying the absence of conflict of interest) should be included at the end of the article under 'Conflicts of Interest'. This information will be included in the published article.

If the author does not have any conflicts of interest, the following statement should be included: "No conflict of interest has been declared by the author(s)."

3) Funding statement

RCPHN requires authors to specify any funding sources (institutional, private, and corporate financial support) for the work reported in their paper. This information, in the form of the name of the funding organization(s) and the grant number or should be included at the end of the article under the heading 'Funding' and provided at the time of submitting the paper. If there was no funding, the following wording should be used: "This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors." Any materials suppliers should be named, and their location (town, state/county, country) included if appropriate. This information will be included in the published article.

3. Title

The title should be concise. In the case of a paper written in Korean, the exact meaning of the English and Korean titles must correspond.

4. Abstract and keywords

1) An abstract of up to 250 words should be typed double-spaced on a separate page. The purpose, methods, results, and conclusion shall be provided sequentially in subheadings without any partitions between paragraphs. When using abbreviations, explanations for those abbreviations must be given.
2) Below the abstract, three to five keywords shall be given in English. Keywords shall not exceed five words, and they must be words registered in the MeSH (https://meshb.nlm.nih.gov/). Up to five Keywords shall be placed at the top of the first page in Korean, and the meaning of them shall match the meaning of the English keywords.

5. Main text

1) Introduction: The introduction section shall be clear and precise and provide only the necessary background information related to the purpose of the study.
2) Methods: Describes the study design, setting, samples, measurements/ instruments, data collection/procedure, ethical considerations, and data analysis used. The instrument can be omitted if it is qualitative research. In the section on ethical considerations, the author should describe that this study protocol was approved by the institutional review board (IRB No. ##-##-###).

   [Description of subjects] Ensure the correct use of the terms sex (when reporting biologic factors) and gender (identity, psychological, or sociocultural factors), and unless inappropriate, report the sex or gender of the subjects, the sex of the animals or cells, and describe the methods used to determine sex or gender. The researcher should include gender or sex of the subjects, if possible. If the study was done involving an exclusive population, e.g., only one sex or gender, the authors should justify why, except in obvious cases. The authors should define how they determined race or ethnicity and justify their relevance.
3) Results: The findings of the study shall be described succinctly and logically.
4) Discussion: The study results shall be interpreted and compared with the findings of other related studies. The research results shall not be described repeatedly.
5) Conclusion: The results or methods of the study shall not be repeated. The interpretations or limitations found in the study must be described, and the purpose of the study shall be related to the results. Authors may propose future directions for research, education, or practice.
6) Conflict of Interests: Authors must disclose any financial or personal relationships with other individuals or organizations that could influence their work.
7) Funding: Authors must specify any funding sources (institu-

tional, private, and corporate financial support) for the work reported in their paper.

8) Author contribution: The RCPHN requires that all authors take public responsibility for the content of the work submitted for review. All authors reviewed the results and approved the final version of the manuscript.

9) Acknowledgments: Persons who have made contributions to the study, but who are not eligible for authorship can be named in this section. Their contribution must be specified, such as data collection, financial support, statistical analysis, or experimentation. The corresponding author must inform the named contributor of the acknowledgment, and acquire consent before manuscript submission.

10) Data availability: A data availability statement tells the reader where the research data associated with a paper is available, and under what conditions the data can be accessed. They also include links (where applicable) to the data set.

Tables and figures

1. Tables and Figures shall be expressed in English. The contents of the tables and figures shall not overlap.
2. The contents of the tables, figures, and pictures shall be easily understood and stand alone.
3. Table guidelines
   1) All lines shall be single-lined and vertical lines shall not be used.
   2) The title of the table shall be placed on top of the table, and the first letters of the important words shall be capitalized (e.g., Table 1. Overall Responses to Question Types).
   3) Separate tables shall be numbered in the order of their first appearance.
   4) Footnotes can be used to convey additional information. Nonstandard abbreviations used in the tables must be explained in the footnotes (e.g., HR = heart rate; T = temperature).
   5) Footnotes in tables should use symbols in the following sequence: $^{\dagger, \ddagger, \S, \|, \P, \#, \dagger\dagger, \ddagger\ddagger}$ The explanations for these superior characters shall be placed on the bottom left of the tables (e.g. †Survival case; ‡Dead case).
   6) 0 shall be placed in front of the decimal point if the number is close to 1 and left blank if the number is not close to 1 (e.g., $t = 0.26$, $F = 0.92$, $r = .14$, $R^2 = .61$).
   7) When reporting p-values, which refer to the significance probability, footnotes shall not be used, but the actual p-values shall be provided. If the p-value is .000, it shall be indicated as $p < .001$, and if the p-value is 1.000, it shall be indicated as $p > .999$.
   8) When reporting decimal numbers, the significance level shall be rounded to three decimal places. Standard deviations, other averages and means shall be rounded to two decimal places, and percentages rounded to one decimal place (e.g., $p = .002$, 23.98 ± 3.47, 45.7%).
   9) When p-values have to be reported using footnotes, *, ** shall be used (e.g., $^{*}p < .05$, $^{**}p < .01$).

4. Figure guidelines
   1) The title of the figure shall be placed below the figure with the first letter capitalized. Separate figures shall be numbered in the order of their first appearance.
   2) When there are two or more figures for the same number, alphabets shall be placed after the Arabic number. (e.g., Figure 1-A and Figure 1-B).

5. Tables and figures shall be in sharp, black lines and adjusted to fit within the A4 size page (width 150 mm × height 200 mm) with the explanations written separately.

6. The resolution of the figures shall be more than 3 million pixels.

In-text citation

Citations of references within the text should follow Citing Medicine: The NLM (National Library of Medicine) Style Guide for Authors Editors, and Publishers 2nd edition (2007) (https://www.ncbi.nlm.nih.gov/sites/books/NBK7256/)

Use [1], [2,3], or [4-6] in the text, and they should be listed in the Reference section in numerical order of their citation.

References

1. All references cited in the text must appear in the Reference section, and all items in this section shall be cited in the text. References cited in the manuscripts such as meta-analyses and systematic reviews are presented in the appendix. Authors are responsible for the accuracy and completeness of their references and correct text citations.
2. State Journal's full name (e.g., Research in Community and Public Health Nursing). The sequence is authors, the title of the paper, journals name, year published, and volume, followed

by page numbers and the Digital Object Identifier (if it is available). For citation from other sources, refer to The NLM Style Guide for Authors, Editors, and Publishers 2nd ed. (2007) (https://www.ncbi.nlm.nih.gov/books/NBK7256/).

3. If the number exceeds six, list only the first six authors followed by et al. shall be given.

Journal article:

1. Cho OH, Yoo YS, Kim NC. Efficacy of comprehensive group rehabilitation for women with early breast cancer in South Korea. Nursing & Health Sciences. 2006; 8(3): 140-146. https://doi.org/10.1111/j.1442-2018.2006.00271.x
2. Bang KS, Kang JH, Jun MH, Kim HS, Son HM, Yu SJ, et al. Professional values in Korean undergraduate nursing students. Nurse Education Today. 2011;31(1):72-75. https://doi.org/10.1016/j.nedt.2010.03.019

Forthcoming journal articles (articles published electronically ahead of the print version):

3. Scerri J, Cassar R. Qualitative study on the placement of Huntington disease patients in a psychiatric hospital: Perceptions of Maltese nurses. Nursing & Health Sciences. 2013. Forthcoming.

Periodicals or magazines:

4. Rutan C. Creating healthy habits in children. Parish Nurse Newsletter. 2012 May 15:5-6.

Newspaper articles:

5. Cho C. Stem cell windpipe gives Korean toddlers new life. The Korea Herald. 2013 May 2; Sect. 01.
6. Lyderson K. Risk of disease rises with water temperatures. Washington Post [Internet]. 2008 Oct 20 [cited 2008 Dec 19]:A08. Available from: http://www.washingtonpost.com/wp-dyn/content/article/2008/10/19/AR2008101901533.html Article includes a correction.

Books:

7. Peate I. The student's guide to becoming a nurse. 2nd ed. Chichester WS: John Wiley & Sons; 2012. 660 p.

Parts of books (chapter):

8. Reed JG, Baxter PM. Library use: handbook for psychology. 3rd ed. Washington: American Psychological Association; c2003. Chapter 2, Selecting and defining the topic; p. 11-25.

Entire book on the Internet

9. Peterson K. Guide to life science careers [Internet]. Cambridge: NPG Education; c2014 [cited 2020 Jul 2]. Available from: https://www.nature.com/scitable/ebooks/guide-to-life-science-careers-14053951/.

Scientific and technical reports:

10. Perio MA, Brueck SE, Mueller CA. Evaluation of 2009 pandemic influenza A (H1N1) virus exposure among internal medicine house staff and fellows. Health Hazard Evaluation Report. Salt Lake City, Utah: University of Utah School of Medicine, 2010 October. Report No.: HETA 2009-0206-3117.

Dissertations and theses (This journal does not recommend citing dissertations or theses. If necessary, less than three should be cited.)

- Doctoral dissertation:

11. Jin HY. A study on the analysis of risk factors and characteristics for nosocomial infection in intensive care unit [dissertation]. [Seoul]: Yonsei University; 2005. 108 p.

- Master's thesis:

12. Kim JS. A study on fatigue, stress and burnout of pregnancy nurses [master's thesis]. [Gwangju]: Chonnam National University; 2012. 50 p.

Papers and poster sessions presented at meetings

- For a paper:

13. Bryar R. The primary health care workforce development roadmap. Paper presented at: The public health nursing contribution to primary health care 3rd International public health nursing conference; 2013 Aug 25-27; National University of Ireland Galway (NUIG). Galway.

- For a poster session:

14. Bigbee J. Promoting the health of the population: Public health nursing leading the way. Poster session presented at: The public health nursing contribution to primary health care 3rd International public health nursing conference; 2013 Aug 25-27; National University of Ireland Galway (NUIG). Galway.

Conference publications

15. Dostrovsky JO, Carr DB, Koltzenburg M, editors. Proceedings of the 10th World Congress on Pain; 2002 Aug 17-22; San Diego, CA. Seattle: IASP Press; c2003.

Citing material on the Internet

- Standard citation to an open serial database on the Internet:

16. TrialSearch [Internet]. New York: AIDS Community Research Initiative of America. c2003 - [cited 2007 Feb 1]. Available from: http://www.acria.org/.

- Standard citation to a retrieval system on the Internet:

17. WHOSIS: WHO Statistical Information System [Internet]. Geneva: World Health Organization. c2007 - [cited 2007 Feb 1]. Available from: http://www.who.int/whosis/en/.

- Standard citation to a homepage:

18. Statistics Korea. 2010 life tables for Korea [Internet]. Seoul: Statistics Korea; 2011 [cited 2012 January 16]. Available from: http://kostat.go.kr/portal/korea/kor_nw/3/index.board?bmode=read&aSeq=252533.

- Homepage with no authors or editors:

19. StatePublicHealth.org [Internet]. Washington: ASTHO; [cited 2007 Feb 23]. Available from: http://statepublichealth.org/.

Appendix

1. Authors should submit an appendix to show the developed final measurements in the instrument development study and a list of articles reviewed in the systematic review or meta-analysis research.
   1) Supplementary material: Supplementary material can support and enhance your scientific research. Supplementary files offer the author additional possibilities to publish supporting applications, high-resolution images, background datasets, sound clips, and more. Please note that such items are published online exactly as they are submitted; there is no typesetting involved (supplementary data supplied as an Excel file or as a PowerPoint slide will appear as such online).
   2) Please submit the material together with the article and supply a concise and descriptive caption for each file. If you wish to make any changes to the supplementary data during any stage of the process, please provide an updated file, and do not annotate any corrections on a previous version.
   3) Please also make sure to switch off the "Track Changes" option in any Microsoft Office files, as these will appear in the published supplementary file(s).

Data sharing and transparency

1. This journal encourages and enables you to share data that supports your research publication, where appropriate, and enables you to interlink the data with your published articles. Research data refers to the results of observations or experimentation that validate the research findings. To facilitate reproducibility and data reuse, this journal also encourages you to share your software, code, models, algorithms, protocols, methods, and other useful materials related to the project.
2. Data generated through the participation of subjects and the public should be put to maximum use by the research community and, whenever possible, translated to deliver patient benefit. Data sharing benefits numerous research-related activities: reproducing analyses; testing secondary hypotheses; developing and evaluating novel statistical methods; teaching; aiding design of future trials; meta-analyses; helping to prevent error, fraud, and selective reporting.
3. To promote more transparent and reproducible research, we ask authors to submit a Data Availability Statement in the manuscript to help authors understand how they can access the data, code and other resources that support the research findings.
4. The following are examples of data-sharing statements:
   Example 1. Data can be obtained from the corresponding author.
   Example 2. Data can be obtained from the supplementary material link.
   Example 3. (In the case of health care big data) Data can be obtained from (the name of the)__repository source.

Registration of a Clinical Trial

1. A clinical trial is defined as "any research project that prospectively assigns human subjects to intervention and comparison groups to study the cause-and-effect relationship between a medical intervention and a health outcome." We encourage the prospective registration of studies. Where a study has been registered, please give the number on your title page and include the registration number within the body of the paper as appropriate.
2. The journal accepts the registration in any of the primary registries that participate in the World Health Organization International Clinical Trials Portal (http://www.who.int/ictrp/en/), the National Institutes of Health ClinicalTrials.gov (https://clinicaltrials.gov/), the International Standard Randomized Controlled Trial Number Registry (https://www.isrctn.com/), or the Clinical Research Information Service, Korea Disease

Control and Prevention Agency (KDCA) (https://cris.nih.go.kr/cris/info/introduce.do).

3. This journal follows the data sharing policy described in "Data Sharing Statements for Clinical Trials: A Requirement of the International Committee of Medical Journal Editors" (https://doi.org/10.3346/jkms.2017.32.7.1051). As of July 1, 2018, manuscripts submitted to ICMJE journals that report the results of interventional clinical trials must contain a data-sharing statement. Clinical trials that began enrolling participants on or after January 1, 2019, must include a data-sharing plan when registering the trial. The ICMJE's policy regarding trial registration is explained at http://www.icmje.org/recommendations/browse/publishing-and-editorial-issues/clinical-trial-registration.html.
4. The journal follows the data-sharing policy described in "Data-sharing Statements for Clinical Trials: A Requirement of the International Committee of Medical Journal Editors (ICMJE)" (https://doi.org/10.3346/jkms.2017.32.7.1051) (http://icmje.org/icmje-recommendations.pdf).
5. If the data-sharing plan changes after registration, this should be reflected in the statement submitted and published with the manuscript and updated in the registry record. Based on the degree of the sharing plan, authors should deposit their data after de-identification and report the digital object identifier, or DOI, of the data and the registered site.

Reporting Guidance for Specific Study designs

For the specific study design, such as randomized control studies, studies of diagnostic accuracy, meta-analyses, observational studies, and non-randomized studies, it is recommended that the authors follow the reporting guidelines (https://www.equator-network.org/).

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1. Submitted manuscript

1) All contributions (including solicited articles) are critically reviewed by the Editorial Board members and reviewers. The decision to publish a paper is based on an editorial assessment and peer review.
2) Prereview: Initially, all papers are assessed by an editorial committee consisting of members of the editorial team. The primary purpose is to decide whether to send a paper for peer review and to give a rapid decision on those that are not put forward.
3) Review: Manuscripts going forward to the review process are reviewed by two or more reviewers and the editor. The Editorial Board reserves the right to refuse any material for publication. The Editor-in-Chief reserves the right to the final decision regarding acceptance. RCPHN uses a double-blinded review. The names of the reviewers will thus not be disclosed to the author submitting a paper, and the name(s) of the author(s) will not be disclosed to the reviewers.
4) The average time from manuscript submission to the author's receipt of the editor's decision about publication is approximately three months. Many excellent manuscripts are accepted, some pending minor revisions. Many other excellent manuscripts may receive a "revise and resubmit" decision.

2. Revised manuscript

1) When you prepare a revised version of your manuscript, you should carefully follow the instructions given in the Editor's letter. Authors are encouraged to follow the suggestions made by the reviewers to make changes and then resubmit with a detailed letter to the editor outlining the changes made following the reviewers' suggestions. Revised submission must also include a point-by-point response to reviewer comments and a traced-changed version of the revised manuscript.
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3) Authors who are responsive to the reviewers' suggestions are well placed to have their manuscripts accepted for publication.
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After acceptance of a manuscript

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1) RCPHN provides the corresponding author with paper proofs for their correction. The corresponding author will receive electronic page proofs to check the copyedited and typeset article before publication. Corrections should be kept to a minimum.
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3) We urge our authors to proofread their accepted manuscripts carefully. The corresponding author may be contacted by the Editorial Office, depending on the nature of the correction in the proof.

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1) Authors are asked to pay a fee to allow perpetual, unrestricted online access to their published articles for readers globally, immediately upon publication to cover some part of the costs associated with publication, depending on the number of pages of the published article.
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1) An erratum will be used if a significant error has been introduced by us during the production of the journal article, including errors of omission such as failure to make factual proof corrections requested by authors within the deadline provided by the journal and within journal policy. A 'significant error' is one that affects the scholarly record, the scientific integrity of the article, the reputation of the authors, or of the journal.
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These regulations are effective from March 24, 2023.

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Abstract

☐ 250 words or less
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Research in Community and Public Health Nursing

Statement of Copyright & Conflict of Interest

1. Transfer of copyright

If this manuscript is published in the Research in Community and Public Health Nursing, its copyright is transferred to the Korean Academy of Community Health Nursing, and the Korean Academy of Community Health Nursing will have the copyright for the concerned manuscript as well as the right to transmit the digital data. The author possesses all the rights except for the copyright, including the right to use all or a part of this manuscript for application for a patent or writing a future thesis. The author may use the material of this manuscript in another manuscript after obtaining written approval. All the authors of this manuscript made practical and intelligent contributions to this manuscript and share public responsibility for the contents of this manuscript. In addition, this manuscript has not been published by or submitted to another academic journal and is not being considered by any other academic journal.

2. Clear statement of interests

The author(s) of this manuscript clearly stated all the interests related to this manuscript, including financial interests (benefit of research funding, employment, possession of stocks, speaker's fees or consultancy fees, material support, etc.) and personal interests (concurrent position, conflict of interest, conflict in intellectual property rights, etc.).

Title of submitted manuscript: _____

Date _____

Author's Name _____ Author's Signature _____

Author's Name _____ Author's Signature _____

Author's Name _____ Author's Signature _____

Author's Name _____ Author's Signature _____

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Author's Name _____ Author's Signature _____

(USE A CONTINUATION SHEET IF NECESSARY FOR ADDITIONAL SIGNATURE.)

RCPHN
Research in Community and Public Health Nursing

Instructions for editors

Article 1

The purpose of these guidelines is to regulate the operation of the Editorial Board (hereinafter referred to as 'the Board') organized according to Article 7 (Committee) of the Bylaws of the Korean Academy of Community Health Nursing.

Article 2

The Board has 7 to 15 members, including the Editor-in-Chief and the Executive Editor, and Associate Executive Editor.

The Editor-in-Chief organizes the Board by recommending the members and obtaining the approval of the Executive Board.

Article 3

1. (Qualifications) The Editor-in-Chief is recommended by the Directors of the Academy in the current and next terms according to the member selection criteria.
2. (Criteria for member selection) One who is experienced in publishing in journals (candidates) registered in the Korea Research Foundation; one who is experienced in publishing in international academic journals; one who is experienced in editing and reviewing for a journal registered in the Korea Research Foundation; and one who has never been subjected to disciplinary punishment related to research and publication ethics.
3. (Procedure) The Director of the Academy or the Editor-in-Chief recommends those satisfying the member selection criteria among the professors at nursing colleges (departments) throughout the country. The Editor-in-Chief then reviews and selects the member candidates of the Board. The Board of Directors approves the candidates, and the Director of the Academy appoints them as the Board members.
4. (Term) The term of the Editor-in-Chief and the members of the Board is two years, and they may be reappointed.

Article 4

The Board deliberates on and decides the following matters for publishing the Research in Community and Public Health Nursing and related academic materials and reporting the results to the Executive Board.

1. Publishing the journal
   (1) Matters on editing
   (2) Review of received manuscripts and decision on whether to publish
   (3) Decision on the article processing charge
2. Issuing academic materials
   (1) Matters on editing and publishing
3. Managing the quality of the Research in Community and Public Health Nursing
   (1) Preparation for the evaluation of journal registered in the Korea Research Foundation
   (2) Preparation for evaluation by KoreaMed
   (3) Maintenance and management of CINAHL registration
   (4) Maintenance and management of SCOPUS registration
4. Regulations related to publishing
5. Matters referred to by the Board of Directors

Article 5

The Board selects and manages the reviewers.

1. (Qualifications) The reviewers are selected according to the following criteria.

A reviewer should be experienced in reviewing for a journal (candidate) registered in the Korea Research Foundation, have a doctoral degree, is a university professor or in an equivalent position, and is familiar with recent advances in each research area.

2. (Number) The number of reviewers shall be around 150, including English proofreaders.
3. (Procedure) The members of the Board recommend candidates among professors at nursing colleges (departments) throughout the country who satisfy the reviewer qualifications, and the Editorial Board reviews and selects among them. The Board of Directors approves them, and the Director of the Academy appoints them as reviewers.
4. (Term) The term of a reviewer is two years, and they may be reappointed.
5. (Special reviewer) If external reviewers are required for a special review of a dissertation, the Editor-in-Chief may appoint special reviewers and entrust them with the review of the dissertation.
6. The review of the manuscript follows separate regulations on review.

Additional Clauses

These guidelines were effective from March 24, 2023.

RCPHN
Research in Community and Public Health Nursing

Criteria for Review

Title: _____

Rate this manuscript on the following criteria using the scale of 1 (lowest) to 5 (highest), then enter your comments in the text boxes below.

Items \ Score	1	2	3	4	5	N/A
Originality of the contribution						
Well written: organized, correct grammar and punctuation						
Significance to population health, nursing practice, and nursing science						
Research Question(s) and Purpose of Study: clearly explicated?						
Methodology: appropriate research design used and described in depth; setting(s) and selection criteria of the participants adequately described; valid and reliable instruments used; ethical issues considered; IRB approval acknowledged						
Findings: comprehensive and clearly described; linked with research questions; tables used appropriately and constructively						
Discussion/Conclusions: based on the data presented; linked with the current literature						
Reference: Does the research mostly use recently published references?						

Date : _____ Reviewer : _____

RCPHN
Research in Community and Public Health Nursing

Instructions for reviewers

We believe that peer review is the foundation for safeguarding the quality and integrity of scientific and scholarly research. This is a guideline for reviewers who voluntarily participate in the peer review process of Research in Community and Public Health Nursing (RCPHN). All of the journal's contents including commissioned manuscripts are subject to peer-review.

1. According to the Bylaws of the Korean Academy of Community Health Nursing and the Regulations on the Editorial Board of KACHN, these guidelines are provided for the review of manuscript submitted to RCPHN.
2. Manuscripts are reviewed and accepted according to these guidelines
3. Manuscripts to be reviewed should be research papers related to community nursing, and dissertations for a master's or doctoral degree goes through the same review procedure. However, the reviewing process may be different in the case of special papers that are contributed to the development of community and public health nursing.
4. Manuscripts not complying with the qualifications and regulations related to the contribution will be rejected.
5. Role of the reviewers: The peer-reviewer's role is to advise editors on individual manuscript to revise, accept, or reject. Judgments should be objective, and comments should be described lucidly. Scientific soundness is the most important value of the journal. Therefore, logic and statistical analysis should be considered meticulously. The use of reporting guidelines is recommended for review. Reviewers should have no conflicts of interest. Reviewers should point out relevant published work that is not yet cited. Reviewed articles are managed confidentially. The editorial board is responsible for the final decision to accept or reject a manuscript based on the reviewers' comments..
6. How to become a reviewer: Reviewers are usually invited by the editorial board or recommended by authors. Anyone who wishes to work voluntarily as a reviewer can contact the editorial office.
7. Two or more reviewers are assigned to each manuscript and the reviewers are appointed by the Editorial Board.
8. Accepting an invitation to review: The Editors will invite you to review because they believe that you are an expert in a certain area. They would have judged this from your previous publication record or conference/posters sessions. Before you accept an invitation to review a paper, you should consider The following:
   · Are you qualified?
   You should decline to review the manuscript if it is too far outside your area.
   · Do you have time?
   If review comments cannot be submitted within the three weeks review period, please decline to review the manuscript or ask for an extension.
   · Are there any potential conflicts of interest?
   In case of any conflicts of interest, the reviewer should decline to review. The conflicts of interest should be disclosed if the reviewer still wishes to review.
9. Double Blind Peer Review: RCPHN adopts double blind review which means that the reviewer cannot identify author information and authors cannot identify reviewers, too.
10. Manuscript are reviewed according to the 'criteria for review'. The reviewer writes their review comments
    1) Criteria for review: Review table with 8 items (Originality, Well written, Significance, Research Question(s) and Purpose of Study, Methodology, Findings, Discussion/Conclusions, and References) using the scale of 1 (lowest) to 5 (highest) (if it is not applicable, check N/A) is provided for the reviewer's convenience.
    2) Comment to authors: Summarize the whole content of the manuscript in one sentence. Mention the strengths of the manuscript, and any problems that make you believe it should not be published, or that would need to be corrected to make it publishable.
    3) Comment to editor: Both the strength and weaknesses of the manuscript should be added. The reviewer's recommendation on acceptance may be added here, including any other opinions to the editor.
11. Ethical Guidelines for Reviewers
    1) Any information acquired during the review process is confidential.
    2) Please inform the editor of any conflicts of interest, such as
       • Reviewer is a competitor.
       • Reviewer may have some antipathy with the author(s).
       • Reviewer may profit financially from the work.
       In case of any of the above conflicts of interest, the reviewer should decline to review. The conflicts of interest

should be disclosed if the reviewer still wishes to review. A history of collaboration with the authors or any intimate relationship with the authors does not preclude the review.

3) Reviewer should not use any material or data originating from the manuscript in review; however, it is possible to use the open data of the manuscript after publication.

12. The review procedures are as follows:
    1) The Editor-in-Chief chooses two or more reviewers and one editor online based on their research specialty.
    2) The reviewers examine the manuscript online and input the evaluation results, what to revise, and what needs to be supplemented in three weeks.
    3) The reviewers should keep confidential the fact that they have reviewed the manuscript.
    4) The results of the review by the two or more reviewers are deliberated by the editorial board, and the editorial Board makes the final decision.
13. Based on the review, the reviewers make general opinions and detailed reports, and decide one of the following: 'Accept,' 'Minor Revision,' 'Major Revision,' and 'Reject.'
14. Based on the two or more reviewers' review results, the Editorial Board decides whether to accept the manuscript.
    1) Accept: Accept without revision.
    2) Minor Revision: The authors should revise as commented by the reviewers, and the reviewers confirm the revisions.
    3) Major Revision: The authors should revise as commented by the reviewers, and the reviewers review the manuscript and decide whether to accept it.
    4) Reject: Only if the contents of the manuscript fall into any of the cases listed below:
        ① The research theme is not original or lacks the significance of nursing.
        ② The contents are plagiarized from previous studies.
        ③ The reliability or validity of the research results is questioned.
        ④ In the evaluation criteria, more than 30% of the items were graded 'Lowest.'
        ⑤ It is considered impossible to revise.
15. The contents of the review shall not be disclosed to anybody other than the author.
16. The editorial board finally decides whether to publish the manuscript by combining the review results of the two or more reviewers and the review results of the editors.
17. If the authors fail to submit a revised manuscript within two weeks from the date of revision request by the Board, it is regarded as being withdrawn (If the author requests an extension, the due date may be extended for another month).

Additional Clauses

These regulations are effective from March 24, 2023.

RCPHN
Research in Community and Public Health Nursing

한국지역사회간호학회 회칙

2006년 12월 12일 전면 개정
2011년 12월 10일 개정
2017년 01월 16일 개정
2017년 12월 14일 개정
2018년 12월 20일 개정
2022년 02월 21일 개정

제1장 총칙

제1조 (명칭) 본 회는 한국지역사회간호학회라 칭한다.

제2조 (목적) 본 회는 지역사회 간호학의 학문적 발전을 위해 교육과 연구에 관한 학술과 정책 활동을 도모하고 회원간 학술적 교류를 목적으로 한다.

제3조 (사무소 소재지) 본 회 사무소는 본회 학회장 소속 기관에 둔다.

제4조 (사업) 제1장 제2조의 목적을 달성하기 위하여 다음의 사업을 행한다.

1. 연구 활동
2. 국내외 학술활동 및 교류
3. 학술 및 홍보활동
4. 학회지 발간 및 출판사업
5. 간호교육 발전을 위한 활동
6. 기타사업

제2장 회원

제5조 (회원자격)

① 본 학회의 회원은 본 법인에 등록을 마친 자로 한다.

② 본 학회의 회원은 다음과 같이 구분한다.

1. 정회원은 간호학을 전공한 자로서 학사학위 이상의 소지자로 한다.
2. 준회원은 본 학회의 목적에 동의하는 자로 한다.
3. 명예회원은 간호학 발전에 공헌이 있는 개인 혹은 기관으로서 실행이사회에서 추대된 자로 한다.

제6조 (회원의 권리와 의무)

① 본 학회의 회원은 정관을 준수하고 다음과 같이 소정의 회비 납부와 본 학회의 사업에 적극 참여할 의무를 갖는다.

1. 정회원과 준회원은 입회비 및 회비를 본 학회에 납부하여야 한다.
2. 정회원은 선거권과 피선거권을 갖는다. 단, 선거예정일로부터 1년 이상 정회원 자격을 유지한 자로 한다.
3. 회원은 본 학회가 제공하는 학회지, 학술정보 등 각종혜택을 받을 권리를 갖는다.

② 본 학회의 회원은 1개 이상의 회원 학회에 가입할 수 있으며 회원이 회원 학회에 복수가입을 원할 경우에는 온라인 가입 후 복수회비를 본 법인에 납부하여야 한다.

제7조 (회원의 탈퇴)

① 회원은 회장에게 탈퇴의사를 서면으로 통고함으로써 본 법인을 임의로 탈퇴할 수 있다.

② 회원이 탈퇴해도 이미 납부한 회비는 반환되지 않는다.

제8조 (회원의 제명)

본 학회의 회원으로서 본 법인의 목적에 배치되는 행위 또는 명예·위신 등의 손상을 가져오는 행위를 하였을 때에는 이사회의 의결로써 회장이 제명할 수 있다.

제3장 조직 및 임원

제9조 (임원) 본회에는 다음과 같은 임원을 둔다.

1. 회장 1명
2. 부회장 1명
3. 총무이사 1명
4. 서기이사 1명
5. 재정이사 1명
6. 학술이사 1명
7. 교육이사 1명
8. 편집이사 1명
9. 출판이사 2명
10. 홍보이사 1명
11. 국제교류이사 2명
12. 정책이사 1명
13. 감사 2명
14. 당연직 이사

제10조 (임원의 직무)

1. 회장은 본회를 대표하고 회무를 정리하며, 본회의의 의장이 된다.
2. 부회장은 회장과 협력하여 본회의 제반 사업 활동을 처리한다.

3. 총무이사는 본회의 일반 제질 활동을 총괄한다.
4. 서기이사는 본회의 회의록을 기록하고, 보고하며, 제반 서류를 보관한다.
5. 재정이사는 본회의 재정을 담당한다.
6. 학술이사는 본회의 학술활동을 총괄한다.
7. 교육이사는 본회의 교육활동을 총괄한다.
8. 편집이사는 본회의 학술활동을 위한 출판을 총괄한다.
9. 출판이사는 본회의 문제은행 관리, 출판활동을 총괄한다.
10. 홍보이사는 본회의 홍보활동을 담당한다.
11. 국제교류이사는 본회의 국제교류활동을 담당한다.
12. 정책이사는 본회 관련된 정책 활동을 담당한다.
13. 감사는 본회 회무 및 재정을 담당한다.
14. 당연직이사는 분야별 학회장과 단체의 장, 지역 지부장으로 한다.

제11조(위원회, 지부, 분야별 학회와 분야별 단체)

1. 본회의 조직과 활동을 위해 별도의 위원회를 둘 수 있다. 위원회의 운영에 관해서는 별도의 규정을 둔다.
2. 본회는 지부, 분야별 학회, 분야별 단체를 둘 수 있다.
3. 지부, 분야별 학회 및 분야별 단체의 운영을 위하여 별도의 규정을 둔다.

제12조(임원의 선임)

1. 회장은 총회에서 출석인원 과반수의 득표로 선출한다.
2. 부회장은 차기 회장 지역의 지역사회 간호학 교수 중 추대된 자로 한다.
3. 감사는 총회에서 선출하되 다수득표자로 정한다.
4. 임원(총무, 학술, 정책, 교육, 편집, 출판, 서기, 재정, 홍보, 국제교류)은 회장이 정하고 재적 총투표자의 다수결에 의한다.

제13조 (임원의 임기)

1. 임원의 임기는 2년이다.
2. 임원의 동일한 직에 1회에 한하여 중임할 수 있다. 임원 중 결원이 있을 때에 회장을 제외하고는 임원회에 서 이를 보선하며 임기는 잔여기간으로 한다.

제4장 회의

제17조 (구성) 본회는 정기총회, 임시총회, 이사회를 둔다.

제18조 (총회의 소집)

정기총회는 매년 12월, 임시총회는 회장이 필요하다고 인정하였을 때 또는 회원 3분의 1이상의 요구가 있을 때 회장이 이를 소집한다.

제19조(총회의 기능)

정기총회는 다음사항을 관장한다.

1. 회칙개정
2. 예산, 결산
3. 임원선거
4. 사업계획
5. 기타 안건 토의

제5장 재정

제21조(재정) 본회의 재정은 다음과 같이 충당 한다.
한국간호과학회로부터 본회에 등록된 회원의 연회비 중일정액을 지급받는다. 지급받은 회비와 찬조금, 기타 사업조성금으로 재정을 충당한다.

제22조(회계연도) 본회의 회계연도는 12월 1일부터 11월 30일로 한다.

부칙

제1조 본회 회칙은 총회 재적 3분의 2이상의 결의로서 수정할 수 있다.
제2조 본회 회칙은 정기총회에서 개정통과일로부터 시행한다.
제3조 기타 본 회칙에 규정되지 아니한 사항은 일반 관례에 따른다.
제4조 한국간호과학회의 인준을 받은 후 2018년 1월 1일부터 시행한다.

부칙 < 2018.12.20. >
제1조 (시행일)
본 회칙은 한국간호과학회의 인준을 받은 날로부터 시행한다.