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Original Articles

Development of an Internet of things-based treatment adherence program among older adults with mild cognitive impairment using Intervention Mapping: A developmental study

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Purpose: Dementia and altered cognitive function are highly prevalent among older adults with mild cognitive impairment (MCI); hence, prevention is necessary before it develops into dementia. Treatment adherence—medication adherence and physical activity—is essential to prevent and delay dementia; however, comprehensive interventions to promote it in this population are lacking. This study aimed to develop a program for treatment adherence utilizing an Internet of Things (IoT) device. **Methods:** The six-step mapping protocol was used to develop the IoT-based treatment adherence intervention (ITAI). The intervention was based on a literature review, expert opinions, and input from older adults with MCI. **Results:** In Step 1, a needs assessment was conducted to gain insights into health problems and their underlying determinants. In Steps 2 and 3, performance objectives were identified for behavior change and selected theoretical and evidence-based methods were linked to the intervention outcomes. In Step 4, the ITAI was designed with components and materials consistent with the identified change goals and methods, and specific intervention components were developed. In Step 5, implementation plans and solutions to barriers to its application were identified. In Step 6, the plan to evaluate intervention effectiveness was outlined. **Conclusion:** The Intervention Mapping provided a systematic procedure for developing an ITAI for older adults with MCI and preparing a randomized controlled trial. Utilizing Intervention Mapping is useful as ITAI systematically processes treatment adherence for MCI using the IoT and is acceptable and valid. ITAI is expected to increase medication adherence and physical activity in older adults with MCI.

Keywords: Cognitive dysfunction; Treatment adherence and compliance; Internet of things; Methods; Aged

INTRODUCTION

1. Background

Mild cognitive impairment (MCI) is a transitional stage between normal aging and dementia, characterized by subjective memory impairment, maintenance of normal cognitive function, and active daily living [1]. MCI increases the risk of dementia and cognitive function change, but it is reversible. Hence, prevention is necessary to avoid its development into dementia. The prevalence of MCI is increasing worldwide, and one out of five Korean older adults (20.2%) suffer from MCI

[1]. The annual morbidity of dementia is 1%~2% and 10%~15% in normal older adults and those with MCI, respectively [2]. Hypertension, diabetes, hyperlipidemia, and atherosclerosis increase the risk of cognitive decline. Diabetes accelerates age-related cognitive decline [3], and increases the risk of dementia among older adults. Diabetes can also lead to complications in the central nervous system and cognitive function processes [3]. Additionally, decreased cerebral blood flow due to aging disrupts mechanisms regulating the brain and enhanced by hypertension. Furthermore, the severity of atherosclerosis in the arteries likely associates hypertension with cognitive decline [4]. People with MCI have a higher prevalence of hypertension, diabetes, and stroke [5]. According to the dementia prevention guidelines, the early detection of chronic diseases, treatment and management of chronic diseases, and regular exercise can prevent dementia [6]. Therefore, people with MCI need chronic disease treatment and regular exercise to reduce and prevent dementia. To manage chronic diseases, it is necessary to understand and follow experts' instructions on drug use, diet, and exercise therapy [7]. Treatment adherence consists of taking medication and complying with a specialist's prescription for chronic disease management [8]. Compliance with medication is essential for treatment adherence. Non-adherence to medication is a major barrier to safe and cost-effective health care delivery among providers. Medications and dosages are key factors in successful healthcare delivery, yet adherence in older adults remains low [9]. Cognitive decline in older adults is a risk factor for medication non-adherence [10]. It also affects instrumental daily activities, including medication use and treatment adherence [11]. For this reason, medication adherence intervention was implemented to solve the problem of medication non-adherence in older adults with MCI [12]. As with previous interventions, it helped people with MCI with medication adherence [12,13]. The mechanism of action associated with physical activity improves cognitive function, stimulates nerve growth, and encourages survival [14]. Physical activity decreases the risk of cerebrovascular diseases by reducing cardiovascular risk factors such as hypertension and hyperlipidemia [15]. Older adults with MCI have lower exercise levels than those with normal cognitive function [5]. A physical activity intervention study revealed that participants who adhered to medication reported improved cognitive function and decreased risk of cerebrovascular and cardiovascular diseases [16], suggesting that both regular physical activity and medication adherence are important in preventing cognitive decline.

The fourth industrial revolution brought in healthcare innovation through the development of information technology and biotechnology, with diseases being prevented using the Internet of things (IoT) platforms, and wearable devices and customized healthcare services showing significant growth [17]. The IoT indicates that each object connects to the Internet and enables communication through technology [17]. Research using the IoT has been conducted on individual interventions to provide educational information tailored to patients' needs and technology-based reminders for patients and medical institutions [18]. Healthcare provider interventions are being developed based on IoT devices [19]. Notably, technology-based interventions improve patient outcomes, costs, and treatment effectiveness. Furthermore, technology-based interventions are employed for early recognition of inadequate performance; reducing complications; and alerting, rewarding, and providing feedback on the patient's progress. A systematic review reports that regular visit strategies (telehealth, home monitoring, and telephonic counseling) have been widely employed to enhance medication adherence [20]. Interventions using periodic visits to improve medication are being challenged because sustained adherence could not be achieved. Considering that individuals with MCI experience memory deterioration, medication adherence intervention strategies are required to ensure continued use. For people with MCI, exercise not only prevents and delays dementia but also assists in managing chronic diseases [21]. However, a well-developed integrated approach for physical activity among older adults with MCI that ensures medication adherence, prevents and delays dementia and manages chronic diseases is unavailable. Technology-based exercises and physical activity rates record, and information and aid supervision are necessary strategies to support care managers' and patients' decisions when developing target programs.

The provision of healthcare through the convergence of the IoT and information and communication technology is recently adopted in managing chronic diseases because of their role in promoting treatment adherence through reminders. Smart health devices are developed and released to aid treatment methods for older adults with MCI [12,22]. IoT also allows immediate institutionalization of interventions by identifying the state and providing prompts for care and to medication adherence leading to desired treatment adherence, and these technologies can help patients with MCI adhere to treatment. This paper describes the methods used and outcomes

obtained from developing and refining a theory- and evidence-based program to facilitate the IoT-based treatment adherence intervention (ITAI). The study aimed to develop an ITAI program to improve treatment adherence (medication adherence and physical activity) using Intervention Mapping steps (development of an intervention) among older adults with MCI.

METHODS

Ethic statement: The study was approved by the Institutional Review Board (IRB) of Yonsei University Health System prior to conducting the study (IRB No. 4-2019-1317).

1. Developing the ITAI

The development of the ITAI followed the Intervention Mapping protocol comprising six steps. The Intervention Mapping protocol is a systematic outline for the development, implementation, and evaluation of intervention for health behavior change [23]. It is considered useful for constructing programs grounded in both theory and empirical data. The Intervention Mapping facilitates the effective development of behavioral change interventions, and many healthcare programs have successfully used it for various interventions [24]. Table 1 shows the six steps of Intervention Mapping and their purpose and methods. The implementation as conducted in each step is presented below.

Step 1 required obtaining insight into the health problems and underlying determinants of older adults with MCI. We developed a complex intervention focused on behavioral support for MCI. Moreover, we first sought to understand the kind of support needed by an individual for their problem. Through this step, we gained insight into the health problems and underlying determinants of treatment adherence among older adults with MCI. To identify training and methods for providing them with the necessary support, we reviewed literature on the health problems associated with MCI. We searched PubMed and Cumulative Index to Nursing and Allied Health Literature (CINHAL) for English articles, and Korean studies Information Service System (KISS), KoreaMed, and Research Information Sharing Service (RISS) databases for Korean arti-

Table 1. The Intervention Mapping Steps Process of the ITAI

	Steps	Objectives	Methods

1	Needs assessment	• Gain insight into health problems and underlying determinants of older adults with MCI	• Review of evidence
			  - Systematic literature review related to the older adults with MCI
			  - Target population
			  - Analysis of behavior
			  - Behavioral determinants

2	Formulation of the change objectives	• Specify performance objectives and changeable determinants	• Intervention outcomes settings
			  - Goal of outcomes
			• Proximity objectives identification
			  - Specific performance goals for behavior change

3	Selection of the theory-based methods and practical strategies	• Identify and select theoretical models
		
		• Select methods that address change objectives
		
		• Select evidence-based and design of practical implications
			• Analysis of prior interventions to select health belief model
			  - A research framework constructed based on the health belief model
			  - Selection of intervention strategies and methods

4	Producing program components and materials	• Intervention content and method composition	• Draft development of the ITAI program with the experts • Content validity test by the experts

5	Planning program adoption and implementation	• Preparing for intervention implementation	• Adoption and implementation planning of the developed program considering its sustainability
			  - Constructing the ITAI
			  - Pretest

6	Planning for evaluation	• Setting up an evaluation plan	• Application of the ITAI program through a quantitative pilot study

ITAI=Internet of things-based treatment adherence intervention; MCI=Mild cognitive impairment.

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The literature review search terms were "mild cognitive impairment OR mild cognition impairment OR mild impairment of cognition OR mild impairment of cognitive function OR cognitive decline" AND "medication adherence OR medication compliance" AND "activity or activities OR walk OR walking OR exercise" AND "program OR programs OR intervention OR interventions OR treatment OR treatments." The following criteria were used to select studies for analysis: (1) research published in English and Korea, (2) experimental or quasi-experimental studies, (3) research conducted for older adults with MCI, and (4) research with medication adherence and physical activity program. Finally, we analyzed 16 of 237 studies after excluding those irrelevant to the topic (Table 2, Appendix 1) [12,13,25-38].

In Step 2, we formulated the outcomes for health behavior change, dividing them into broad and specific performance objectives. We conducted a comprehensive literature review on medication adherence and physical activity among older adults with MCI in Step 1; based on this, overall behavioral goals and specific interventions for older adults with MCI were finalized.

In Step 3, a theoretical analysis was performed to identify effective health behaviors. A research framework was constructed based on the health belief model [39]. The performance strategy based on the health belief model was determined through the literature for health behavioral belief promotion education, self-efficacy improvement, cue to action trigger, cue to action trigger and reminder, and individualized coaching.

In Step 4, we designed the ITAI with components and materials consistent with the identified change goals and methods, described the components, and determined real-world applications. A discussion with six experts was conducted. Some of the experts had participated in the problem analysis in Step 1. To verify the validity of the expert group, the members were three nursing professors with expertise in health-related research and intervention program development, two gerontological nurse practitioners with more than 20 years of experience, and one neurologist.

In Step 5, after a week of pre-testing with participants with MCI, the research team met to discuss the implementation barriers and mitigation action plans.

In Step 6, we designed a randomized control trial pilot study to evaluate interventions. The program includes a nurse's assessment of medication adherence and physical activity, weekly phone visits, and education. Major outcome measurement

Table 2. Literature Review of Studies Related to Medication Adherence and Exercise Intervention

NO.	Author (year)	Design	Population	Intervention	Strategies	Duration	Outcomes measured	Results
1	Insel and Cole (2005) [13]	Before–after study	-27 community-dwelling adults self-administering one prescription medication -Mean age 78 years, range 67~89 years	Use of medication monitoring system (MEMS) as reminder to take medication	-The cues were individually tailored (nurse-instituted individualized) -Provide cues to support remembering with MEMS	8 weeks	Mini-Mental State Examination (MMSE) scores	Medication adherence improved from 64.5% to 78%
2	Kamimura et al. (2012) [12]	Before–after study	-18 community-dwelling adults with a history of non-adherence -Age 81.2±6.2 years	Use of an automatic pill dispenser as reminder to take medication	-Automatic pill dispenser with daily alarms -Caregiver monitoring	12 weeks	Medication adherence: percentage of days that the correct number of doses was taken according to MEMS	-55.5% of users showed 100% improvement in self-administration medication rate (SAMR) values at 1 month -49.9% maintained SAMR values of 100% at 3 months

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Table 2. Continued

NO.	Author (year)	Design	Population	Intervention	Strategies	Duration	Outcomes measured	Results
3	Hawkins and Firek (2014) [25]	Before-after study	-27 outpatients from a veteran administration clinic -Age 65.3±8.2 years	-Pictorial medication sheet with brief instruction on use -An optional CADEX Pocket -Pill Box (ePill LLC) with 4 alarms daily	-Optional alarmed pillbox -Pictorial medication sheets and education -Optional CADEX Pocket Pill Box (ePill LLC) with four vibrating daily alarms -30 day pill counts at visit four time	16~48 weeks	Medication adherence: at each monthly visit, pill counts	Improvement adherence pre- (79.74±16.98) to post intervention (84.74±10.00)
4	Smith et al. (2007) [26]	Randomized controlled trials (RCT)	-Intervention group (n=8) -Control group (n=6)	-Intervention group: video-monitoring phase and/or plain ordinary telephone service (POTS) monitoring phase and/or a standard unmonitored care phase (n=8) -Control group: only POTS and/or un monitored care as match controls to video participants that could not serve as their own control in all 3 phases (n=6)	Televideo monitoring equipment was installed in the homes: -Telephone service (POTS) monitoring -Video monitoring -Visited once per month by the study coordinator	12~24 weeks	Medication adherence: SAMR, i.e., ratio of the number of doses taken independently to the number of all prescribed doses during 1 week (pill count of the pill dispenser)	-Initial compliance rates (1 month into the phase) were 80% for phone, 85% for video, and 75% for controls -End-of-phase values of 81, 80, and 62%, for video, phone, and no monitoring respectively
5	Vervloet et al. (2014) [27]	RCT	Diabetes type 2 patients -Short message service (SMS) group (n=56) -Non-SMS group (n=48) -Control group (n=57)	Real time medication monitoring system offers (real time at a central database)+SMS reminders	-Realtime medication monitoring dispenser -Real time SMS reminders	24 weeks	Pharmacy refill data, pill counts	-SMS group (79.5% vs. 64.5%, +16.3%) -Non-SMS group reached 73.1% (+7.3%)

Table 2. Continued

NO.	Author (year)	Design	Population	Intervention	Strategies	Duration	Outcomes measured	Results
6	Marek et al. (2013) [28]	RCT	Older adults Medi-care-certified self-man-aging medications (N=414)	Pharmacy screens medi-cation-dispensing ma-chine or a medplanner visited the participants at least every 2 weeks	-Advanced practice nurse reviewed all medica-tions identified -Received a medplanner (nurse care coordina-tion) -Provided prompts for medication administra-tion as well as feedback on missed doses -Medication-dispensing system with alarm -The nurse creates a treatment plan specific to each participant's clinical condition -Nurse visits every 2 weeks -The care plans included monitoring of specific signs and symptoms re-lated to medical diag-noses, medications, and other individualized problem areas	12~48 weeks	Health status outcomes: Geriatric Depression Scale, MMSE, Physical Performance Test, Mental Component Summary, SF-36 Physical Compo-nent Summary	The time by group inter-actions were signifi-cant for outcome vari-ables
7	Suzuki et al. (2013) [29]	RCT	-Exercise group (n=50) -Control group (n=50)	Aerobic exercise, strength training, balance, dual tasking 2×90 min/wk	Aerobic strength	24 weeks	MMSE, logical memory scores	MMSE, logical memory scores improved in the exercise group
8	Lam et al. (2011) [30]	RCT	-Tai Chi group (n=171) -Control group (n=218)	-Tai Chi exercise: ≥3×30 min/wk -Control group: stretch-ing ≥3×30 min/wk, group intervention	Tai Chi exercise	12 weeks	Memory Inventory for the Chinese, cognitive sub-scale (Alzheimer's Disease Assessment Scale [ADAS-Cog]), Clinical Dementia Rating (CDR), Neuropsy-chiatric Inventory, The Berg Balance Scale (BBS)	Improvements in atten-tion and the CDR scores in the exercise group

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Table 2. Continued

NO.	Author (year)	Design	Population	Intervention	Strategies	Duration	Outcomes measured	Results
9	Baker et al. (2010) [31]	RCT	-Exercise group (n=23) -Control group (n=10)	-High-intensity exercise: treadmill, stationary bicycle, elliptical trainer, 4×45~60 min/wk -Control: stretching 4×45~60 min/wk, group intervention	High-intensity exercise	24 weeks	Symbol digit verbal fluency, Stroop and task switching, Story Recall	-Improved for women in the exercise group -Delayed recall: no difference
10	Lautenschlager et al. (2008) [32]	RCT	-Physical activity group (n=85) -Control group (n=85)	-Physical activity program: walking, strength training 3×50 min/wk -Usual care control educational material individual intervention	Walking, strength	24 weeks	Scale–Cognitive subscale (ADAS-Cog) scores	Intervention group improved ADAS-Cog
11	Shin (2011) [33]	Non-equivalent control group pre-post test	-Exercise group (n=17) -Control group (n=17)	Swiss Ball exercise program: performed 2 times/wk	Swiss ball exercise	12 weeks	One Legged Stand (OLS), Timed Up & Go (TUG), Sit-To-Stand (STS), Active Daily Living (ADL)	Improvement OLS, TUG, STS, ADL
12	van Uffelen et al. (2008) [34]	RCT	-Group 1 (n=77) -Group 2 (n=75) -Group 3 (n=78) -Group 4 (n=74)	-Group 1: aerobic walking, 2×60 min/wk and vitamin B supplementation -Group 2: placebo activity, 2×60 min/wk and vitamin B supplementation -Group 3: walking 2×60 min/wk and placebo supplementation -Group 4: placebo activity, 2×60 min/wk and placebo supplementation, group intervention	Aerobic walking	24~48 weeks	Neuropsychological tests, MMSE	-No improvement in MMSE or verbal fluency -Women with good attendance in aerobic walking improved delayed recall
13	Scherder et al. (2005) [35]	RCT	-Walking group (n=15) -Hand and face exercises (n=13) -Control group (n=15)	-Walking group: walking 3×30min/wk -Hand and face exercises, bending and stretching the fingers, producing different facial expressions 3 × 30 min/week -Control group: social visits or normal social activities individual intervention	Walking, bending and stretching	6 weeks	Executive Functions (EF)	Improvement in tasks appealing to EF walking group and the hand/face group

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Table 2. Continued

NO.	Author (year)	Design	Population	Intervention	Strategies	Duration	Outcomes measured	Results
14	Kim et al. (2010) [36]	One group pre-post test	Exercise group (n=16)	Combined exercise: walk, Yoga three times/wk	Walking yoga	8 weeks	Cognition Scale for Older Adults (CSOA)	Improvement CSOA
15	Kim et al. (2019) [37]	One group pre-post test	Internet of things (IoT)–based exercise group (n=30)	IoT-based exercise program (upper exercise 3 content and lower exercise conetnts); twice weekly exercise	IoT-based upper, lower exercise	12 weeks	Grip strength, Gait speed, Five chair, standing time Short Physical Performance Battery (SPPB), MMSE	Improvement Grip strength, Gait speed, Five chair standing time, SPPB score, MMSE exercise group
16	Jung (2018) [38]	One group pre-post test	Square–stepping exercise (n=26)	Square-stepping exercise: twice weekly exercise	Square–stepping	8 weeks	Montreal Cognitive Assessment (MoCA-K), BBS, TUG	Improvement MoCA, BBS

consists of items for treatment adherence; medication adherence, and physical activity level (gait phase and physical activity assessment) and additionally measures perceived health beliefs and self-efficacy.

2. Patient and Public Involvement

There are inadequately developed integrated approach for physical activity among older adults with MCI that ensures medication adherence, prevents and delays dementia and manages chronic diseases. This paper describes the methods used and outcomes obtained from developing and refining a theory- and evidence-based program to facilitate the ITAI. During the development process, the researcher was trained to conduct the intervention. The researcher participated in a one-day training course on the components of developing IoT interventions targeting older adults. The nurse involved in the intervention implementation received supervision and feedback from the first author, patients, and relatives on delivering the post-implementation interventions. Also, a trained nurse examined the pre-test of the intervention in five older adults with MCI from a neurology outpatient clinic who met the predetermined inclusion criteria. After ITAI was initially completed, five older adult patients with MCI tested the usability of the developed intervention. The patients and caregivers were informed that by signing this consent form, they consent to the collection and use of their information, and the data collected during the research will be used for research purposes. They were also informed that the findings would be published in international journals or through conferences without directly linking personal data to the collected information.

3. Delimitation of the Study

This study used Intervention Mapping to develop an ITAI for the management of MCI. Results from Steps 5 and 6 of the Intervention Mapping steps will be published in a future paper. We have applied only pre-testing using a feasibility test for the development of an intervention plan that can be implemented in future studies.

4. Ethics Approval and Consent to Participate

The study was approved by the IRB of Yonsei University

Health System prior to conducting the study (IRB No. 4-2019-1317).

RESULTS

1. Step 1: Needs Assessment

In the first step of the needs assessment, we reviewed and analyzed the health problems and behaviors of MCI to identify the determinants. Furthermore, the final participation criteria were as follows: aged 65 years or older, diagnosed with MCI by a neurologist, no previous history of any psychiatric disease, taking medications for a chronic disease, using a smartphone, and those who have a primary caregiver. People with a diagnosis of dementia and severe respiratory and cardiovascular disease were excluded.

1) Analysis of Behavior

Compared to older adults in general, those with MCI suffered from more chronic diseases such as hypertension and diabetes [3]. Medication adherence among community-dwelling individuals with MCI was reportedly between 64.8% and 75.0% [13,26]. As most participants with MCI lived in their homes, the need for an integrated intervention to improve the adherence of doctor-prescribed medication and physical activity (hereafter referred to as treatment adherence) for dementia prevention was necessary.

We found that older adults with MCI perceived difficulties in performing healthy behaviors. Although they could perform normal activities, they had memory impairment due to cognitive decline, which means that even though they thought of implementing healthy behaviors, they could not practice them due to a decline in memory. Cognitive decline in such individuals, therefore, acts as a risk factor for lower medication adherence [40] and affects instrumental activities of daily living, rendering it difficult to comply with treatment [11]. Although exercise is recommended for those at risk or individuals who are living with dementia, many are inactive [41]. Older adults with MCI are less active than those without it, and few meet the recommended physical activity for maintaining their health and functioning [42]. The tendency for low physical activity and fitness in people with MCI or dementia may be due to different barriers concerning exercise participation. Because these people are generally older, they must fight the perceived age-related barriers to exercise

participation, such as fear of falls, increased risk of injury, and a perception of limited benefits of exercise [42]. Education is needed to overcome these barriers. Moreover, it is essential to improve the perceived health beliefs related to physical activity [39].

2) Analysis of Behavioral Determinants

In this study, we confirmed the theoretical definition and developed an operational definition of treatment adherence. The former refers to the degree to which an individual performs behaviors consistent with a clinical prescription [8]. The latter entails the adherence to prescribed medication for chronic diseases and physical activity. We considered the major behavioral determinants of individuals with MCI based on the health belief model to identify the factors that could change behaviors for treatment adherence. The main factors affecting the health behavior of participants with MCI are problems of cognitive impairment, which do not allow behaviors to be practiced owing to the lack of perceived health beliefs (threats and expectations) [43] and memory deterioration. Exercise providers promote movement in these groups by recognizing and responding to the needs of people with MCI or dementia in exercise programs [41]. Furthermore, cue to action interventions have been implemented to help memory by focusing on strategies that trigger actions [13]. However, even if the perceived health beliefs are enhanced, it is difficult to practice them due to memory impairment. Specifically, we recognized the need for a method that could help improve health beliefs and memory for people with MCI to practice health behaviors.

2. Step 2: Outcomes and Objectives

The second step was to identify intervention outcomes based on needs assessment. The intervention goal was treatment adherence by improving the patients' medication adherence and performance of physical activities, to reduce the risk of dementia. We defined behavioral outcomes as an "increase in treatment adherence." As perceived health beliefs and behavioral triggers cause these treatment adherence behaviors, the performance goals should be devised around them. Subsequently, we established objectives by selecting important and modifiable determinants of behavior, taking medication based on perceived health beliefs and creating cues to action for behavior leading to reaching or maintaining medication adherence. To achieve these, we formulated the change goals (Table 3).

Table 3. Definitions of Elements in the Conceptual Framework

Concept	Theoretical definition	Operational definition	Component of this study	Behavioral outcomes			Personal determinants	Performance objectives	Change objectives
				Treatment adherence	Medication adherence	Physical activity			
Older adults with MCI	Individual demographic and sociological characteristics.	Demographic and health-related characteristics of the older adults with MCI.	Education, evaluation	Treatment adherence	Medication adherence		– Perceived health beliefs	– The patient decides to practice taking medication based on perceived health beliefs.	– To improve perceived health beliefs and self-efficacy, the experts develop and apply health belief improvement education.
Threat	The combination of perceived severity and susceptibility is referred to as perceived threat. Perceived severity and perceived susceptibility to a given health condition depend on knowledge about the condition.	Personalized nursing education makes individuals more aware of perceived severity and susceptibility of dementia; they are more likely to participate in dementia-related health prevention actions.	Education, self-efficacy, demonstration, and evaluation				– Cue to action (reminder, personal influence)	– Cue to action for behavior leading to reaching or maintaining medication adherence.	– Provide a reminder strategy, an opportunity for action, to prevent memory impairment in patients to promote medication adherence.
Expectations	The expectation (perceived benefits, barriers, and self-efficacy) is that a certain health action could prevent the condition for which people consider they might be at risk.	Perceived benefits and barriers can be strengthened through personal nursing education with nurses. Use of self-efficacy strategies for program content.	Telephone calls and counselling, education, and Internet of things (IoT) device			Physical activity	– Perceived health beliefs – Cue to action (reminder, personal influence)	– The patients' perceived health beliefs and behavioral triggers help them adhere to or maintain physical activity.	– To enhance perceived health beliefs and self-efficacy, the experts develop and apply perceived health belief improvement education. – As a strategy for promoting physical activity, strategies such as feedback from the experts are provided.
Cue to action	The cue or trigger is necessary to increase engagement in health-promoting behaviors.	IoT device-based cue or trigger and personal nursing coaching.	Medication adherence, physical activity, and self-efficacy						
Behavior	Behavior to reduce threats based on expectations. Health outcome that changes positively through modifications in health behaviors.	Medication adherence and physical activity among older adults with MCI.	Pre-post evaluation						

MCI=Mild cognitive impairment.

3. Step 3: Theoretical Methods and Practical Strategies

In the third stage, we identified and selected theoretical models and evidence-based methods to address the change objectives described earlier. The health belief model was found to be appropriate because it accounted for health behavior changes, including key motivational factors and individual perceptions, to explain preventive health behaviors. The health belief model is divided into risk and expectation factors in the perceived health beliefs; based on this classification, health behaviors can be practiced using a cue to action. Health beliefs refer to behaviors regarding disease control that help in behavior change and function as prerequisites for action [39]. The health belief model consists of five concepts of behavioral change: perceived severity, susceptibility, benefit, barriers, and self-efficacy [39]. To develop the interventions, we confirmed the theoretical definition of the health belief model, established an operational definition, identified the components of this study (Table 3), and constructed a framework.

1) Behavior Change Techniques

After identifying the patient and ITAI target behaviors, interventions were developed for older adults with MCI; an intervention method using the IoT to provide reminders was selected for action trigger strategies [25]. Additionally, perceived health beliefs promotion education and self-efficacy enhancement strategies were developed. Recently, devices that help medication adherence can prompt and monitor drugs based on the IoT, enabling the use of technology-oriented reminders [18]. As a strategy to promote physical activity, recommended walking (cardio exercise) that is not limited by time and space was selected as it could easily induce regular exercise in older adults [32]. Regarding the IoT, wrist-worn devices promoted walking. We further developed personalized goals and contents for their achievement as follows: the ITAI based on perceived health beliefs improvement education and the self-efficacy enhancement strategy; the IoT smart pillbox, wrist-worn devices, and action trigger strategies as reminders [25]; and personalized nursing coaching strategies [26].

4. Step 4: Developing Intervention Components

1) Development of the ITAI Content

The fourth stage involved designing an ITAI with components and materials consistent with the change goals and methods identified in Step 3, which was discussed with the expert group. The individual components and the real-world applications that were developed were described. First, design problems were identified by reviewing the literature on interventions based on the health belief model [39] and those using the IoT. Second, data on communication technology information about the device were obtained. Finally, educational programs on the perceived severity, susceptibility, benefit, and barriers (perceived health beliefs) were developed as a strategy for improving health behavior beliefs. The intervention strategy consisted of self-efficacy enhancement approaches, including achievement experience, proxy experience, and verbal persuasion [44]. To improve an individual's perceived health beliefs, participants and their primary caregivers were educated on disease knowledge, dementia risk factors, the importance of medication adherence and physical activity, how to exercise walking, and how to practice drug use. Personalized training methods were implemented via handouts, and pre-intervention training was provided to participants lasting approximately 20~30 minutes. During the intervention period, for customized nursing coaching, an IoT-based smart pillbox alerted the user to take medicines, and a wrist wearable device reminded the user to go walking. In the introductory step, we trained a researcher (registered nurse) in prescription recommendations, IoT smart pillbox, and wrist wearables, using handouts, educational material, and demonstrations. Personalized nursing coaching, which is conducted via weekly telephone consultation, lasting about 20 minutes enquired about feedback on the patient's medication adherence rates, the average weekly steps, and then the weekly steps goals for the ensuing week. Additionally, in real-time, the researcher immediately checked the medication adherence status through the data transmitted from the smart pillbox. If the patients failed to take medication more than twice, the researcher instantaneously contacted them via phone and sent a text message to the primary caregiver. Primary caregivers provide the most care for older adults with MCI, mainly daughters, sons, and daughters-in-law in Korea. When the primary caregivers received the text message, they were instructed to visit or call the older adults with MCI or help them take their medications. During the maintenance period, a reminder strategy was implemented, excluding customized nursing coaching, to maintain a reminder set for a personalized smart pillbox and a wearable alarm set as a maintenance strategy to promote physical activity.

2) Content Validation

The panel of five experts (comprising physician, nursing professors, and geriatric practitioners with at least 10 years of experience) evaluated the education and program content validity, and the relevance of the ITAI using the Polit and Beck methods [45]. We measured the content validity index of the overall ITAI program using the scale content validity index. The proportion of education and program content that reported a rating of 3 or 4 by all content experts (scale content validity index/universal agreement), the average of the item content validity index for all items on the scale (scale content validity index/average proportion), and the content validity index of ITAI individual content items (item content validity index) [46]. The scale content validity index is a composite score that requires key components like the scale content validity index/universal agreement, scale content validity index/average proportion, and the item content validity index. Each item was rated on a 4-point scale to avoid having an ambivalent midpoint: 1, not relevant; 2, somewhat relevant; 3, quite relevant; and 4, highly relevant. The experts' scores are assigned relevance when they score 3 to 4 on the Likert-type scale. When the assigned score is deemed as relevant then a 1 is assigned and when it is deemed not to be relevant then a 0 is assigned. The individual item content validity index ratio was computed as the number of relevant ratings, therefore, dichotomizing the scale into either relevant (1) or not relevant (0). As a result, the scale content validity index/universal agreement, scale content validity index/average proportion, and scale content validity index/universal agreement ranged from 1.00. The criteria of the dimensions that indicated sound content validity were item content validity index >0.78 and scale content validity index/average proportion >0.90 (Appendix 2).

5. Step 5: Implementation Plan

The ITAI will be planned as a pre-post design with a control group, comprising an intervention period of 6 weeks, and a maintenance period of 4 weeks based on the 16 articles included in the literature review. We discussed the potential issues and barriers to intervention implementation and devised a plan to ensure the execution with the expert group. Additionally, the researcher was trained to conduct the intervention. The researcher who provided the intervention participated in a one-day training course on the components. Subsequently, the nurse received supervision and feedback on how they delivered the post-implementation interventions. A trained nurse examined the pre-test of the intervention in five older adults with MCI. After ITAI was initially completed, five older adults tested its usability. During the pre-test, the project leader supervised the nurse to ensure that the assessment was carried out as described. After a week of pre-testing, the five older adults with MCI and a research team met to discuss the barriers to implementation to develop an action plan to overcome the barriers. The main difficulty identified during the testing phase was that older adults with MCI forgot to use the device due to memory impairment. To solve this problem, we created a poster with an illustration and provided a description of the device, and placed it in the patients' homes where they could observe it while taking medications.

6. Step 6: Evaluation Plan

The evaluation of the intervention is part of the implementation process. We conducted a pre-test and designed a randomized controlled trial to assess the feasibility of the intervention, and investigated the delivered practice. The goal of the intervention is to enhance medication adherence, physical activity, perceived health beliefs, and self-efficacy. The final IATI for older adults with MCI is presented in Table 4 and Figure 1. In the first week, which is the start of the intervention, the patients are given a demonstration of the IoT device in their homes. The nurse evaluates the physical activity assessment and medication adherence. Thereafter, the researcher provides face-to-face education for medication adherence and physical activity. The patients implement daily activity (steps count), which is monitored through a wearable device. For 1 to 6 weeks, the nurse researcher performs daily checks through real-time monitoring of medication adherence through the webserver. If medication non-adherence happens twice in a row, the nurse makes an immediate call to the participant and sends a text message to the caregiver. Furthermore, nurses provide weekly phone visits to provide feedback and motivation. For seven to 10 weeks, the participants themselves implement medication adherence and physical activity enhancement with the help of an IoT device. The primary outcomes are medication adherence rates and the average weekly step count. This study will have a duration of 10 weeks, and the outcome variables will be assessed at baseline, 6 weeks, and 10 weeks. Outcome assessment measures will include perceived health beliefs, self-efficacy, medication adherence, and physical activity

Table 4. Contents of the Internet of Things (IoT)-Based Treatment Adherence Intervention Program

Week	Health beliefs cue to action sources		Intervention	Strategy
	Reminder	Personal influence		
1		√	IoT-based smart pillbox setting in patient home; Training on the use of smart pillbox, and wrist-worn wearables and app (initial weeks)	Demonstration and patient performance
		√	Check how to take the medication and assess the remaining number	Registered nurse (RN) evaluation
		√	Physical activity assessment	RN evaluation
		√	Education on preventing and delaying dementia; the importance of medication adherence and physical activity	Face-to-face education
		√	Check the correct usage performance of the smart pillbox and wearable	Patient performance
		√	Wearable alarm settings to promote physical activity: check the weekly average step count and set target steps	RN and patient performance
1~6		√	Real-time monitoring of medication adherence through the web server	RN evaluation (every day)
		√	Daily physical activity (step count) monitoring through wearable apps	RN evaluation (every day)
	√		Wearable alarm settings to promote physical activity: check the weekly average step count and set target steps	Patient performance
	√	√	Medication non-adherence twice in a row: Immediate phone call; a text message sent to a caregiver	RN evaluation; Telephone calls by RN
	√	√	Weekly phone visit: feedback and motivation	Telephonic counselling by RN
7~10	√		Keep using smart medicine boxes and wearables	
	√		Follow personalized smart medicine box alarm settings	
	√		Follow the wearable alarm settings	
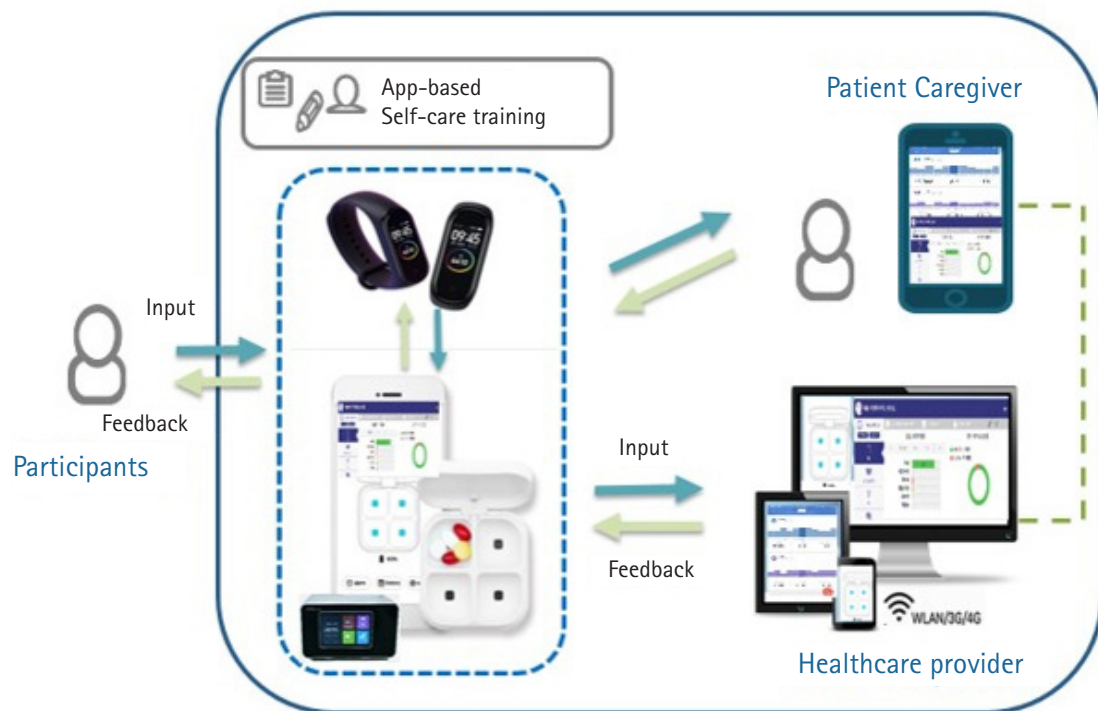
Figure 1. Structure of Internet of things-based treatment adherence intervention.

levels. The outcomes will be analyzed using a linear mixed-effects model with random effects and repeated measures effects.

DISCUSSION

The use of Intervention Mapping ensured an efficient approach to intervention development, including the participation of the target population. It was ascertained that the intervention was systematically approached and based on the available evidence and theories. It was grounded in theory so that the project planner could specify the essential determinants and outcome factors. This framework also made it easy to determine what needed to be changed due to the intervention. In this study, we described the systematic evolution of the ITAI interventions according to the Intervention Mapping.

The goal of our intervention was to improve treatment adherence by enhancing medication adherence and physical activity so that dementia could be prevented or delayed in people with MCI in the long term. Previous interventions to promote medication adherence [10,18] and physical activity [32] exist, but relatively few interventions include a real-time approach and feedback. The program developed in this study is useful as it is an ITAI with a real-time approach focusing on treatment adherence and fully considers the environment in which the technology-based healthcare service influence has grown. This program is based on the theory of health belief behavior designed to increase treatment adherence and prevent cognitive decline in older adults with MCI. The ITAI will help improve treatment adherence outcomes, and ultimately, prevent or delay dementia and improve health status among community-dwelling older adults with MCI. Community health workers, healthcare providers, and administrators can easily access older adults with MCI living at home or in institutions and improve treatment performance.

The Intervention Mapping enabled us to describe and design our intervention using selected strategies that are essential for older adults with MCI. The Intervention Mapping was found to be a beneficial and systematic way to describe interventions; however, to ensure standardization using the IoT, we spent extensive time identifying and using IoT-based Korean products. This was done to select a product that would suit the patients' individual needs. This paper explained the interventions in detail and with transparency to inspire other programs that are being developed using different methods.

Community-dwelling older adults with MCI have been observed to have varying impairments and considerable comorbidities. The ITAI is intended to provide support to older adults with MCI with some degree of independence who live in communities rather than those who receive institutional care or depend on domiciliary carers. Older adults with MCI within some communities may have considerable physical function limitations or debilities and may be depressed. Therefore, our intervention might not entirely meet their needs and treatment adherence. As a result, those with specific difficulties (e.g., comorbid chronic illnesses, physical function limitations, behavioral and psychological symptoms) may require some tailored goal adherence support from a nurse, doctor, or pharmacist.

The possibility of accepting IoT devices for older adults with MCI was confirmed. The ITAI in this study can be managed at the patient's home in real-time, and the health manager can check the patient's treatment progress anytime, anywhere, making immediate intervention possible, reducing cost and time, and increasing the effect. However, older adults with MCI needed several educational sessions and demonstrations as one or two sessions were insufficient. The nurse researcher had to visit the participants' homes several times because they forgot to use the device due to a malfunction or memory loss. Thus, the extent to which the provider intervention contributed to increased treatment adherence rates is unclear. For this reason, during the intervention period, older adults with MCI were asked to identify additional barriers by identifying the number of training and demonstration sessions required. Provider training was designed for providers serving older adults with MCI and might not be effective in diverse settings or contexts as the materials used may not resonate with other populations. Additionally, the Coronavirus disease 2019 (COVID-19) pandemic began after our intervention was developed, with accompanying restrictions on physical activity and interaction due to social distancing. In future programs, it is necessary to develop exercise interventions that can be applied within the COVID-19 context.

Nevertheless, Intervention Mapping can serve as a blueprint for adapting the intervention to different populations and environs while retaining the core program components. It is possible to reorganize and utilize training tailored to the target audience before the application of ITAI. Furthermore, as a strategy to increase utilization in practice, it is necessary to establish a web-based system that allows the target person to be linked

from the hospital to the community dementia prevention center for healthcare providers as a form of management. It can be used for patient treatment by establishing a system in which the patient management results are linked to the hospital for future use.

CONCLUSION

In conclusion, the Intervention Mapping was used as a methodical procedure for developing the ITAI for older adults with MCI. Healthcare providers can use this program to improve treatment adherence for chronic disease management and dementia prevention in older adults with cognitive impairment. Further studies are warranted to evaluate the effectiveness of this intervention. Efficacy assessment would contribute to strategies for improving treatment outcomes in older adults with MCI.

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Authors' contribution

Study conceptualization and methodology - JS, EC, GSK, HK, BSY, and CGP; Data collection and analysis - JS and EC; Drafting and critical revision of the manuscript - JS, EC, GSK, HK, BSY, and CGP; Supervision - JS and EC; All authors have read and agreed to the published version of the manuscript.

Conflict of interest

No existing or potential conflict of interest relevant to this article was reported.

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Data availability

All data generated or analyzed during this study are included in this published article.

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REFERENCES

1. Ministry of Health and Welfare. Dementia related statistics production and management systematization plan [Internet]. Ministry of Health and Welfare; 2019 Jan 15 [updated 2019 Jun 5; cited 2023 Jun 29]. Available from: http:// www. mohw.go.kr/react/jb/sjb030301vw.jsp?PAR_MENU_ID = 03&MENU_ID = 032902&CONT_SEQ = 347400&page = 1

2. Petersen RC, Smith GE, Waring SC, Ivnik RJ, Tangalos EG, Kokmen E. Mild cognitive impairment: clinical characterization and outcome. Archives of Neurology. 1999;56(3): 303-8. https://doi.org/10.1001/archneur.56.3.303

3. Jamalnia S, Javanmardifard S, Akbari H, Sadeghi E, Bijani M. Association between cognitive impairment and blood pressure among patients with type II diabetes mellitus in Southern Iran. Diabetes, Metabolic Syndrome and Obesity. 2020;13:289-96. https://doi.org/10.2147/DMSO.S238247

4. Cechetto DF, Hachinski V, Whitehead SN. Vascular risk factors and Alzheimer's disease. Expert Review of Neurotherapeutics. 2008;8(5):743-50. https://doi.org/10.1586/14737175.8.5.743

5. Park M, Sung MR, Kim SK, Lee DY. Comparison of demographic characteristics, comorbidity, and health habits of older adults with mild cognitive impairment and older adults with normal cognitive function. Journal of Korean Academy of Nursing. 2014;44(4):351-60. https://doi.org/10.4040/jkan.2014.44.4.351

6. Lee DW, Seong SJ. Korean national dementia plans: from 1st to 3rd. Journal of the Korean Medical Association. 2018;61(5):298-303. https://doi.org/10.5124/jkma.2018.61.5.298

7. Kwon MS, Noh GY, Jang JH. A study on relationships be-

tween health literacy, disease-related knowledge and compliance to medical recommendations in patients with hypertension. Journal of Korean Public Health Nursing. 2013; 27(1):190-202. https://doi.org/10.5932/JKPHN.2013.27. 1.190

8. Jay S, Litt IF, Durant RH. Compliance with therapeutic regimens. Journal of Adolescent Health Care. 1984;5(2):124-36. https://doi.org/10.1016/s0197-0070(84)80012-1

9. Osterberg L, Blaschke T. Adherence to medication. The New England Journal of Medicine. 2005;353(5):487-97. https://doi.org/10.1056/NEJMra050100

10. Leung DY, Bai X, Leung AY, Liu BC, Chi I. Prevalence of medication adherence and its associated factors among community-dwelling Chinese older adults in Hong Kong. Geriatrics & Gerontology International. 2015;15(6):789-96. https://doi.org/10.1111/ggi.12342

11. Petersen RC, Caracciolo B, Brayne C, Gauthier S, Jelic V, Fratiglioni L. Mild cognitive impairment: a concept in evolution. Journal of Internal Medicine. 2014;275(3):214-28. https://doi.org/10.1111/joim.12190

12. Kamimura T, Ishiwata R, Inoue T. Medication reminder device for the elderly patients with mild cognitive impairment. American Journal of Alzheimer's Disease and Other Dementias. 2012;27(4):238-42. https://doi.org/10.1177/1533317512450066

13. Insel KC, Cole L. Individualizing memory strategies to improve medication adherence. Applied Nursing Research. 2005;18(4):199-204. https://doi.org/10.1016/j.apnr.2004.08.007

14. Lippi G, Mattiuzzi C, Sanchis-Gomar F. Updated overview on interplay between physical exercise, neurotrophins, and cognitive function in humans. Journal of Sport and Health Science. 2020;9(1):74-81. https://doi.org/10.1016/j.jshs.2019.07.012

15. Sofi F, Capalbo A, Marcucci R, Gori AM, Fedi S, Macchi C, et al. Leisure time but not occupational physical activity significantly affects cardiovascular risk factors in an adult population. European Journal of Clinical Investigation. 2007;37(12):947-53. https://doi.org/10.1111/j.1365-2362.2007.01884.x

16. Guimarães FC, Amorim PR, Reis FF, Bonoto RT, Oliveira WC, Moura TA, et al. Physical activity and better medication compliance improve mini-mental state examination scores in the elderly. Dementia and Geriatric Cognitive Disorders. 2015;39(1-2):25-31. https://doi.org/10.1159/000366413

17. Aghdam ZN, Rahmani AM, Hosseinzadeh M. The role of the Internet of Things in healthcare: future trends and challenges. Computer Methods and Programs in Biomedicine. 2021;199:105903. https://doi.org/10.1016/j.cmpb.2020.105903

18. Granger BB, Bosworth HB. Medication adherence: emerging use of technology. Current Opinion in Cardiology. 2011;26(4):279-87. https://doi.org/10.1097/HCO.0b013e328347c150

19. Tamblyn R, Reidel K, Huang A, Taylor L, Winslade N, Bartlett G, et al. Increasing the detection and response to adherence problems with cardiovascular medication in primary care through computerized drug management systems: a randomized controlled trial. Medical Decision Making. 2010;30(2):176-88. https://doi.org/10.1177/0272989X09342752

20. El-Saifi N, Moyle W, Jones C, Tuffaha H. Medication adherence in older patients with dementia: a systematic literature review. Journal of Pharmacy Practice. 2018;31(3):322-34. https://doi.org/10.1177/0897190017710524

21. National Institute of Dementia. Prevention of dementia [Internet]. National Institute of Dementia; 2014 Oct 21 [cited 2019 May 7]. Available from: https://www.nid.or.kr/notification/prevention.aspx

22. Greenaway MC, Duncan NL, Smith GE. The memory support system for mild cognitive impairment: randomized trial of a cognitive rehabilitation intervention. International Journal of Geriatric Psychiatry. 2013;28(4):402-9. https://doi.org/10.1002/gps.3838

23. Bartholomew LK, Parcel GS, Kok G. Intervention mapping: a process for developing theory-and evidence-based health education programs. Health Education & Behavior. 1998; 25(5):545-63. https://doi.org/10.1177/109019819802500502

24. Hesselink G, Zegers M, Vernooij-Dassen M, Barach P, Kalkman C, Flink M, et al. Improving patient discharge and reducing hospital readmissions by using Intervention Mapping. BMC Health Services Research. 2014;14:389. https://doi.org/10.1186/1472-6963-14-389

25. Hawkins LA, Firek CJ. Testing a novel pictorial medication sheet to improve adherence in veterans with heart failure and cognitive impairment. Heart & Lung. 2014;43(6):486-93. https://doi.org/10.1016/j.hrtlng.2014.05.003

26. Smith GE, Lunde AM, Hathaway JC, Vickers KS. Telehealth home monitoring of solitary persons with mild de-

mentia. American Journal of Alzheimer's Disease and Other Dementias. 2007;22(1):20-6. https://doi.org/10.1177/1533317506295888

27. Vervloet M, van Dijk L, de Bakker DH, Souverein PC, Santen-Reestman J, van Vlijmen B, et al. Short- and long-term effects of real-time medication monitoring with short message service (SMS) reminders for missed doses on the refill adherence of people with Type 2 diabetes: evidence from a randomized controlled trial. Diabetic Medicine. 2014;31(7):821-8. https://doi.org/10.1111/dme.12439

28. Marek KD, Stetzer F, Ryan PA, Bub LD, Adams SJ, Schlidt A, et al. Nurse care coordination and technology effects on health status of frail older adults via enhanced self-management of medication: randomized clinical trial to test efficacy. Nursing Research. 2013;62(4):269-78. https://doi.org/10.1097/NNR.0b013e318298aa55

29. Suzuki T, Shimada H, Makizako H, Doi T, Yoshida D, Ito K, et al. A randomized controlled trial of multicomponent exercise in older adults with mild cognitive impairment. PLoS One. 2013;8(4):e61483. https://doi.org/10.1371/journal.pone.0061483

30. Lam LC, Chau RC, Wong BM, Fung AW, Lui VW, Tam CC, et al. Interim follow-up of a randomized controlled trial comparing Chinese style mind body (Tai Chi) and stretching exercises on cognitive function in subjects at risk of progressive cognitive decline. International Journal of Geriatric Psychiatry. 2011;26(7):733-40. https://doi.org/10.1002/gps.2602

31. Baker LD, Frank LL, Foster-Schubert K, Green PS, Wilkinson CW, McTiernan A, et al. Effects of aerobic exercise on mild cognitive impairment: a controlled trial. Archives of Neurology. 2010;67(1):71-9. https://doi.org/10.1001/archneurol.2009.307

32. Lautenschlager NT, Cox KL, Flicker L, Foster JK, van Bockxmeer FM, Xiao J, et al. Effect of physical activity on cognitive function in older adults at risk for Alzheimer disease: a randomized trial. JAMA. 2008;300(9):1027-37. https://doi.org/10.1001/jama.300.9.1027

33. Shin HS. The effect of swiss ball exercise on lower extremity function of elderly women with mild cognitive impairment. Journal of the Korean Society of Physical Medicine. 2011;6(2):119-26.

34. van Uffelen JG, Chinapaw MJ, van Mechelen W, Hopman-Rock M. Walking or vitamin B for cognition in older adults with mild cognitive impairment? A randomised

controlled trial. British Journal of Sports Medicine. 2008;42(5):344-51. https://doi.org/10.1136/bjsm.2007.044735

35. Scherder EJ, Van Paasschen J, Deijen JB, Van Der Knokke S, Orlebeke JF, Burgers I, et al. Physical activity and executive functions in the elderly with mild cognitive impairment. Aging & Mental Health. 2005;9(3):272-80. https://doi.org/10.1080/13607860500089930

36. Kim YG, Han DW, Lee BK. The effects of walking and yoga exercise on the cognitive functions in the elderly women. Journal of the Korean Society of Physical Medicine. 2010;5(3):211-21.

37. Kim GM, Yang JG, Park HT. The effect of a IoT-based exercise program using on cognitive function and physical function in the mild cognitive impairment. Korean Journal of Sports Science. 2019;28(1):1343-51. https://doi.org/10.35159/kjss.2019.02.28.1.1343

38. Jung HJ. The effects of square-stepping exercise on cognitive and physical exercise function of elderly with mild cognitive impairment [master's thesis]. Ewha Womans University; 2018. 81 p.

39. Rosenstock IM, Strecher VJ, Becker MH. Social learning theory and the Health Belief Model. Health Education Quarterly. 1988;15(2):175-83. https://doi.org/10.1177/109019818801500203

40. Midão L, Giardini A, Menditto E, Kardas P, Costa E. Adherence to medication in older adults as a way to improve health outcomes and reduce healthcare system spending. In: D'Onofrio G, Greco A, Sancarlo D, editors. Gerontology IntechOpen; 2017. https://doi.org/10.5772/intechopen.72070

41. Bechard LE, McDougall A, Mitchell C, Regan K, Bergelt M, Dupuis S, et al. Dementia- and mild cognitive impairment-inclusive exercise: perceptions, experiences, and needs of community exercise providers. PLoS One. 2020;15(9):e0238187. https://doi.org/10.1371/journal.pone.0238187

42. O'Connell ME, Dal Bello-Haas V, Crossley M, Morgan DG. Attitudes toward physical activity and exercise: comparison of memory clinic patients and their caregivers and prediction of activity levels. Journal of Aging and Physical Activity. 2015;23(1):112-9. https://doi.org/10.1123/japa.2013-0035

43. Kim S, Sargent-Cox K, Cherbuin N, Anstey KJ. Development of the motivation to change lifestyle and health behaviours for dementia risk reduction scale. Dementia and

Geriatric Cognitive Disorders Extra. 2014;4(2):172-83. https://doi.org/10.1159/000362228

44. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Psychological Review. 1977;84(2):191-215. https://doi.org/10.10370033-295x.84.2.191

45. Polit DF, Beck CT. The content validity index: are you sure you know what's being reported? Critique and recommendations. Research in Nursing & Health. 2006;29(5):489-97. https://doi.org/10.1002/nur.20147

46. Lynn MR. Determination and quantification of content validity. Nursing Research. 1986;35(6):382-5. https://doi.org/10.1097/00006199-198611000-00017

Appendix 1. Systematic literature review process of the study. DB=Database.

| Identification | Journal records identified through DB searching (n=199) | Thesis & Dissertation records identified through DB searching (n=38) |

Records identified through DB searching (n=237) ← Duplicates removed (n=20)

Titles and abstracts screened (n=217)

Records excluded with reasons (n=194)
-Survey (n=21)
-Systematic literature review and Review studies (n=15)
-Mixed method study (n=1)
-Qualitative study (n=1)
-Different subjects (n=15)
-Different dependent variable (n=21)
-Not related subject study (n=120)

Full-text articles assessed for eligibility (n=23)

Full-text articles excluded, with reasons (n=7)
-Different contents of intervention (n=2)
-Combined studies (n=5)

Studies included in quantitative synthesis (n=16)

Appendix 2. Rating on an Internet of things-based treatment adherence intervention program of program content and education by five experts: Rated 3 or 4 on a 4-point relevance scale. CVI=Content validity index; I=Item-level.

Category	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Experts in agreement	Item CVI
Contents of Program							
1	√	√	√	√	√	5	1.0
2	√	√	√	√	√	5	1.0
3	√	√	√	√	√	5	1.0
3-1	√	√	√	√	√	5	1.0
3-2	√	√	√	√	√	5	1.0
3-3	√	√	√	√	√	5	1.0
4	√	√	√	√	√	5	1.0
5	√	√	√	√	√	5	1.0
6	v	√	√	√	√	5	1.0
7	√	√	√	√	√	5	1.0
8-1	√	√	√	√	√	5	1.0
8-2	√	√	√	√	√	5	1.0
					Average I–CVI=		1.0
Proportion relevant	1.0	1.0	1.0	1.0	1.0		
Contents of Interventions Program by Week							
1	√	√	√	√	√		1.0
2~6	√	√	√	√	√		1.0
7~10	√	√	√	√	√		1.0
					Average I–CVI=		1.0
Proportion relevant	1.0	1.0	1.0	1.0	1.0		
Contents of Education							
1	√	√	√	√	√	5	1.0
2	√	√	√	√	√	5	1.0
3	√	√	√	√	√	5	1.0
4	√	√	√	√	√	5	1.0
5	√	√	√	√	√	5	1.0
6	√	√	√	√	√	5	1.0
7	√	√	√	√	√	5	1.0
8	√	√	√	√	√	5	1.0
					Average I–CVI=		1.0
Proportion relevant	1.0	1.0	1.0	1.0	1.0		

Nurses' perceptions of gerontological nurse practitioner programme curricula: A qualitative descriptive study

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Purpose: This study aimed to describe nurses' perceptions of gerontological nurse practitioner (GNP) programme curricula, especially positive and negative aspects of the curricula and suggestions to improve the curricula. **Methods:** Twenty-one certified GNPs attended one or two interviews and the data obtained were analysed using a conventional content analytic method. **Results:** The analysis revealed seven categories and 18 subcategories. The main positive aspects of the GNP programme curricula were "Acquiring knowledge and skills to elder care through the GNP programme" and "Application of gerontological nursing-related knowledge and skills attained from the GNP programme." The negative aspects included "Didactic education insufficient for the development of expertise in gerontological nursing" and "Ineffective and suboptimal operation of clinical practice curriculum." Suggestions to improve the GNP programme curricula were "Enhancement of education in core courses," "Strengthening the contents of gerontological nursing didactic courses," and "Quality improvement of clinical practice." **Conclusion:** The findings indicate that educators, policymakers, and other stakeholders should re-examine the current GNP programme curricula to provide GNP students with quality education and training pertinent to professional healthcare for older adults in various healthcare settings.

Keywords: Nurse practitioners; Advanced practice nursing; Geriatric nursing; Nursing education; Qualitative research

INTRODUCTION

1. Background

South Korea became an aged society in 2018 and is projected to become a super-aged society by 2025 [1]. To manage older adults' health and functions effectively and thereby improve their quality of life, it is imperative for healthcare providers to obtain the appropriate knowledge and skills for elder care through additional education and training. The gerontological nurse practitioner (GNP) is one of the healthcare providers who have advanced education and training in elder care. In South Korea, the GNP refers to an advanced practice nurse (APN) who 'establishes nursing plans, conducts various programmes, and cares for older adults in hospitals, medical welfare institutions, and nursing homes to improve their health and conditions' [2]. Following the legislation of the APN system in 2003, 2,511 registered nurses (RN) received a GNP certificate through certification examination by 2021 [3].

To become a GNP in South Korea, an RN must complete 13-credit core courses, 10-credit gerontological nursing didactic courses, and 10-credit clinical courses on master's-level in an educational institution recognized by the Minister of Health and Welfare and pass the national certification examination [4]. Although each institution operates its GNP programme with some variability, its curriculum is based on the standard

curriculum that the Korean Accreditation Board of Nursing Education presents. The Board requires that the GNP educational programme consists of six core courses (i.e., pathophysiology, pharmacology, advanced health assessment, nursing research, nursing theory, APN roles and related policies), five gerontological nursing didactic courses (i.e., advanced gerontological nursing for healthy aging and health promotion, management of geriatric disorders I and II, management of long-term care I and II), and at least 300-hour gerontological nursing-related clinical courses (i.e., practicum in nursing management of health problems in older adults I and II, practicum of long-term care management I and II) [5].

The GNP educational programme has been evolving since its commencement in 2004. Under the permission of the Ministry of Health and Welfare in August 2003, seven Schools of Nursing launched the GNP educational programme in 2004 [6]. The Korean Accreditation Board of Nursing Education established operational guidelines for APN educational programmes to comply with in 2006 and convened a Curriculum Special Committee in 2014 to derive the core competencies of APNs and review the educational programmes by field. After a long discussion process, the Board confirmed the reorganization of the GNP programme curricula in 2021, and each school has been reorganizing its GNP programme curricula currently [5]. In addition, the Board has made the first revision to APN educational programme operation guidelines in March 2023 after the release of the operation guidelines in 2006 [7].

To improve or maintain the quality of APN education, the Korean Accreditation Board of Nursing Education has audited APN education programmes at each institution annually. However, the evaluation focuses on the status of student enrolment and completion as well as the structure and operation of APN programmes rather than the content and quality of education [8]. In 2014, Shin et al. [9] showed that GNP students faced difficulty in attaining the GNP competence owing to a lack of GNP preceptors who could serve as role models in the clinical setting. In the real-life scenario, staff nurses who are not GNPs and physicians served as preceptors in clinical practice [9].

On 19 April 2022, the Ministry of Health and Welfare revised and promulgated the Rules on Recognition of Qualifications as Professional Nurses, which stipulates the scope of practice for nurse practitioners (NPs) in 13 fields [10]. Furthermore, this revised regulation provides a basis for entrusting the quality management of professional nurse education institutions, which may contribute to the effective development of APNs' clinical roles and capability. Unfortunately, knowledge of the quality of GNP programme curricula from the programme completers' perspectives is limited. Therefore, this study was conducted with an aim to describe positive and negative aspects of the current GNP programme curricula and provide suggestions to promote/improve the programme, from the perspective of RNs who are certified GNPs. The findings of this study may provide a fundamental framework for the development of practical strategies that improve the quality of GNP education and training.

2. Research Purpose

This study was performed to describe nurses' perceptions of the GNP programme curricula with a key focus on identifying the positive and negative aspects of the programme curricula and provide suggestions to improve the curricula.

METHODS

Ethic statement: This study was approved by the Institutional Review Board (IRB) at Chung-Ang University (IRB No. 1041078-202111-HR-330-01), and we obtained written informed consent from participants.

1. Study Design

This study employed a qualitative descriptive approach with semi-structured, individual interviews and conventional content analysis [11].

2. Participants and Recruitment

This study utilized purposeful sampling to recruit RNs with a GNP certification who provide care to older patients in clinical settings. Recruitment for this study was advertised through the website of Korean Association of Advanced Practice Nurses and the nurse community mobile application which was used by over three million nurses to manage and share their work schedules. Individuals who fulfilled the inclusion criteria and were interested in participating could directly contact the principal investigator (PI) or submit their name and contact information through the online link that was provided. The PI

explained the study's purpose and methods again and received written informed consent which was submitted online. Each potential participant who was interviewed was asked about other potential participants, and this additional snowball sampling approach facilitated the recruitment process. The recruitment continued until no new information related to the experiences of GNP programme curricula emerged. A total of 21 participants were recruited.

3. Data Collection

Prior to data collection, the authors developed an interview guide based on a review of the relevant literature and a consultation with a nursing professor with expertise in gerontological nursing, and pilot-tested the interview guide on three RNs who were certified GNPs. The main interview questions were: "Please tell me how the GNP programme that you were enrolled has helped you with your clinical practice"; "Could you tell some good things about the GNP programme that you had enrolled in?"; "Tell me about something that you think is unsatisfactory or problematic in the GNP programme"; and "Please tell me any suggestion to improve the quality of the GNP programme curricula."

The PI collected data through semi-structured individual interviews with the participants from 2 February to 8 March 2022. After obtaining permission from the participants for audio-recording an interview, the PI conducted interviews in person (n = 2) or by telephone (n = 19) based on the participant's convenience, at their desired time, and in places (a meeting room at a hospital and separate area in cafe) where privacy could be protected. The PI started interviews by asking about the participants' general characteristics (e.g., age, sex, degree of education, marital status, religion, years of GNP certification, total clinical experience, and position) and indicated their answers in the questionnaire. Prior to the main interviews, the PI obtained permission from the participants once again to audio-record the interviews. Each participant participated in one to two interviews; the first interview lasted 30~60 minutes whereas the second interview, which was conducted to ask additional questions or clarify unclear information, lasted, on average, 10 minutes. During the interview, questions were asked flexibly according to the flow of the participant's story, and the PI maintained a sympathetic attitude as much as possible to create a comfortable atmosphere. Moreover, the PI documented the non-verbal expressions of the participants during the interviews and the reflection notes at the end of each interview (interview atmosphere, subject attitude, researcher's feelings, summary of the interview, etc.). The audio-recorded interviews were transcribed verbatim, and the PI compared the transcripts with audio-recordings to confirm their accuracy.

4. Data Analysis

The general characteristics of the participants were analysed using descriptive statistical analysis in the IBM SPSS 27 program (IBM Corp.). We managed and analysed interview data using NVIVO 13 (QSR International), a qualitative research and analysis software. To describe nurses' perceptions of the GNP programme curricula and provide suggestions to improve the curricula, the interview data were analysed using the conventional content analysis with an inductive coding method [12]. Two authors repeatedly read transcripts to familiarise themselves with the content of the interviews, and independently open-coded the first three transcribed interview data, compared the results, and reconciled any differences through discussion. Thereafter, the PI coded the rest of the transcripts and grouped similar or relevant codes into subcategories and categories; the second author reviewed and confirmed the codes, subcategories, and categories at weekly meetings. Moreover, two authors selected representative quotes from the interviews to present the findings, and the quotes were translated into English by the bilingual second author.

5. Researcher Preparation and Trustworthiness

The PI received education and training on qualitative research by availing nursing research courses in the master's programme, reviewing the literature on qualitative methodologies, participating in qualitative research as an interviewer, and meeting with nursing professors who were qualitative research experts. Furthermore, the PI had more than 10 years' experience in caring for older adults in the internal medicine and surgical wards and outpatient departments of tertiary general hospitals, which helped to not only establish relationships with the participants but also understand the contents of the interviews.

To secure the trustworthiness of the study's findings, Lincoln and Guba's four criteria were considered [13,14]. To ascertain credibility, which establishes whether the collected data and the analysed results are reliable, the PI conducted interviews

with sufficient margin to allow the participants to fully express their experiences. During the interview, the participants' ambiguous statements were clarified until the PI fully understood the statements. Furthermore, when the PI found a lack of content or an incomprehensible section during the analysis, she contacted the participants to schedule additional interviews. The reliability of analysis and interpretation could be increased through discussion with the second author about the research results. Transferability means to evaluate whether the analytical results can be extrapolated to a similar situation. The PI tried to increase the transferability by describing the participants' vivid and specific expressions. Dependability, a criterion for evaluating whether a study has been conducted in a consistent and traceable manner, was maintained by recording all processes of data collection and analysis and verifying the documentation with the second author who has rich experience in qualitative research. To determine the confirmability, a criterion for evaluating what efforts have been made to minimise researcher bias or influence, the PI tried to maintain neutrality by setting aside her personal bias and reflecting the experience and thoughts of the participants as much as possible.

6. Ethical Considerations

This study was approved by the IRB at Chung-Ang University (IRB No. 1041078-202111-HR-330-01). The PI informed the participants about the purpose of the research, methods, benefits and risks, the need for audio-recording of the interview, the anonymity of the data, the guarantee of privacy and confidentiality, the incentive for participating in the research, and the right to refuse to participate in the research. Then, the PI obtained written informed consent online from the participants.

RESULTS

1. General Characteristics of the Participants

Table 1 shows the general characteristics of the 21 participants (age: 38.1 ± 7.7 years, all females); the majority of participants were married (n = 12, 57.1%), religious (n = 11, 52.4%), had 10~20 years of professional experience (n = 10, 47.6%), and most frequently worked in tertiary general hospitals (n = 10, 47.6%), followed by secondary general hospitals (n = 5, 23.8%), long-term care hospitals (n = 3, 14.3%), and nursing

Table 1. General Characteristics of Participants (*N*=21)

Characteristic	Category	Value
Age (year)		38.1±7.7 (28~56)
Sex	Female	21 (100)
Marital status	Single	9 (42.9)
	Married	12 (57.1)
Religion	No religion	10 (47.6)
	Christian	6 (28.6)
	Buddhism	3 (14.3)
	Catholic	2 (9.5)
Locations of educational institutions	Seoul (7 institutions)	18 (85.7)
	Gyeonggi-do (1 institution)	1 (4.8)
	Others (2 institutions)	2 (9.5)
Period since certification (year)	<1	8 (38.1)
	1 to <5	8 (38.1)
	5 to <10	1 (4.8)
	≥10	4 (19.0)
Total clinical experience (year)	5 to <10	5 (23.8)
	10 to <20	10 (47.6)
	≥20	6 (28.6)
Clinical experience in current position (year)	<1	5 (23.8)
	1 to <5	8 (38.1)
	5 to <10	1 (4.8)
	10 to <20	7 (33.3)
Current workplace	Tertiary hospital	10 (47.6)
	General hospital	5 (23.8)
	Long-term care hospital	3 (14.3)
	Nursing home	3 (14.3)
Current position	GNP	4 (19.0)
	Other APN	3 (14.3)
	Coordinator or educational nurse	2 (9.5)
	General nurse	9 (42.9)
	Head nurse	3 (14.3)

Values are presented as mean±standard deviation (range) or number (%). APN=Advanced practice nurse; GNP=Gerontological nurse practitioner.

homes (n = 3, 14.3%). The period from the GNP certification was mostly less than 5 years (n = 16, 76.2%). The participants' current positions were a gerontological APN (n = 4, 19.0%), other APNs (n = 3, 14.3%), coordinator or educational nurse (n = 2, 9.5%), general nurses (n = 9, 42.9%), or managers (n = 3, 14.3%). Twenty-one participants in this study completed their education at ten different educational institutions.

2. Nurses' Perceptions of the GNP Programme Curricula

From the data analysis, seven categories and 18 subcategories emerged regarding three domains: (a) positive aspects of GNP programme curricula; (b) negative aspects of GNP pro-

gramme curricula; and (c) suggestions to improve the curricula (Table 2).

1) Positive Aspects of the GNP Programme Curricula

The positive aspects of the GNP programmes that the participants had enrolled in included being able to acquire knowledge and skills specific to elder care and apply them to their clinical practice. This domain comprises two categories and four subcategories.

(1) Acquiring knowledge and skills to elder care through the GNP programme

Through the GNP programme curricula, participants articulated that they were able to descriptively and intensively learn about aging-related physical, cognitive, psychological, and social changes, the characteristics of older adults' health problems, and how to manage the health problems. The most helpful content included non-specific signs and symptoms of older adults' health problems, types and management of dementia, and the latest management guidelines for various diseases that are common in older adults. Through their acquisition of knowledge about older adults' aging-related normal changes and common health problems, the participants were able to cultivate an inclusive attitude toward older adults and their health problems.

We learned a lot of knowledge and skills related to older adults. This knowledge and skill helps to understand not only the physical part of older adults, but also the social and psychological parts. It really helped me a lot in caring for older patients, and I came to understand them more comprehensively.

(2) Application of gerontological nursing-related knowledge and skills attained from the GNP programme

By learning advanced health assessment, pharmacology, and communication methods, the participants were able to apply

Table 2. Participants' Perceptions of GNP Programme Curricula

Domain	Category	Subcategory
Positive aspects of the GNP programme curricula	Acquiring knowledge and skills to elder care through the GNP programme	Intensive learning about health issues of older adults
		Cultivating a broad understanding and inclusive attitude towards older adults
	Application of gerontological nursing–related knowledge and skills attained from the GNP programme	Applying expert knowledge of gerontological nursing to patient care
		Educating patients and families based on professional knowledge and skills learned from the programme curricula
Negative aspects of the GNP programme curricula	Didactic education insufficient for developing expertise in gerontological nursing	Didactic education not focused on health care for older adults
		Didactic education lacking clinical reflection
		Insufficient content on the role of GNPs in health care for older adults
	Ineffective and suboptimal operation of the clinical practice curriculum	Lack of quality clinical practice guidance
		Suboptimal practice settings
		Poor clinical practice operation
Suggestions to improve the curricula	Enhancement of education in core courses	Strengthening education on pathology, pharmacology, and advanced health assessment linked to the characteristics of older adults
		Addition of education to improve administration, planning, and communication skills
		Reflection of actual field expert opinions in training contents
	Strengthening the contents of gerontological nursing didactic courses	Reinforcement of educational contents regarding the management of older adults' health and diseases
		More educational contents related to medical welfare services for older adults
		More educational contents on the latest trends in care for older adults
	Quality improvement of clinical practice education	Assignment of practice sites where the actual roles of GNPs can be observed
		Securing various practice sites

GNP=Gerontological nurse practitioner.

their knowledge and skills to their care of older adults and families in clinical practice. Particularly, some participants stated that education about long-term care insurance for older adults helped them to provide older adults and their families with better education regarding the social welfare services that are available to older adults and families.

While I was in the GNP programme, I learned a lot. First, my knowledge increased a lot, so the application of it also improved a lot. In fact, older adults are different from adults, right? By getting to know those characteristics (of older adults) better, I was able to take care of the older patient's emotional part in a different way.

Besides the acquisition of knowledge and skills specific to elder care, there were a couple of additional comments. One participant liked the content that pertained to GNPs being primary care providers in the United States, and another participant stated that it was good to learn how to begin and operate long-term care businesses and facilities.

2) Negative Aspects of the GNP Programme Curricula

The negative aspects of the GNP programme curricula that participants enrolled in included didactic education that was insufficient for the development of expertise in gerontological nursing and ineffective and suboptimal operation of the clinical practice curriculum. This domain consists of two categories and six subcategories.

(1) Didactic education insufficient for developing expertise in gerontological nursing

Participants stated that the didactic education of the GNP programme curricula was less focused on elder care than they had expected. Though many older adults have multiple chronic conditions, the didactic content was too focused on the management of individual diseases to address the complex and complicated care needs of older adults with multiple chronic conditions. Moreover, some participants pointed out the insufficiency of content on social welfare and long-term care of older adults.

Older adults have a lot of chronic diseases, don't they? …… (In the management of diseases of older adults) I learned about each individual disease, not complex issues derived from multiple chronic conditions. In clinical fields, in fact, older adults have a complex of various geriatric diseases with multiple physical and cognitive declines.

Furthermore, participants reported that the didactic education provided in the GNP programme often barely reflected the latest trends or actual clinical practice; therefore, they felt that the didactic content was disconnected from the current clinical practice. Specifically, the content of advanced health assessment course was considerably general and old-fashioned; thus, participants found it difficult to apply their knowledge and skills for assessing older adults' health and functional status and even found some skills actually useless in clinical practice. In addition, though they believed that GNPs should be able to interpret the results of diagnostic tests that are commonly performed for older adults and understand the pharmacological mechanisms of medications that are commonly prescribed to older adults in clinical practice, the basic science courses were less helpful for the equipment of such practical knowledge than they expected.

What I was dissatisfied with the most was the content of basic medical science. I expected that learning basic medical science would give me the ability to interpret patients' culture results in a clinical setting, but it didn't. What medication should be used based on the results of the culture? What criteria are considered by the infectious department? What does extended-spectrum beta-lactamase or carbapenem-resistant Enterobacteriaceae mean? As an APN, [we should know] …

Furthermore, some participants complained about the insufficient course content on the roles of GNPs in elder care. Though the participants learned how to treat individual health problems of older adults, they were still uncertain about how to contribute to elder care as GNPs.

In the management of diseases in older adults... Though the opinions of physicians are important, I think that nurses also have specialised knowledge necessary to perform direct nursing care when caring for [older] patients in clinical practice. So, I wondered what it would have been like to have lectures about geriatric diseases and their treatments from APN.

(2) Ineffective and suboptimal operation of the clinical practice curriculum

Participants articulated that the GNP programme's clinical practicum was ineffective and suboptimal to develop their professionalism as GNPs. The reasons were the lack of high-quality clinical practice guidance, suboptimal practice settings, and

poor clinical practice operation.

First, in relation to the lack of high-quality clinical practice guidance, it was difficult to learn about the role of a GNP because clinical practice was mainly based on observation, without a GNP preceptor or systematic practice guidance. One participant stated, "*In clinical settings, I didn't have much experience [besides observation]. I didn't even observe how GNPs function in elder care [because there weren't GNPs in clinical settings].*"

Furthermore, some participants indicated suboptimal practice sites, wherein their clinical practice sites included outpatient clinics (often unrelated to elder care), high-end long-term care hospitals, and nursing homes. Often, the clinical sites did not meet the individual learning needs of students, as expressed by one participant: "*To be honest, I don't think there was much I could learn from outpatient clinic practice. We didn't know about [medical histories of] the outpatients who visited, but we just sat there listening to physicians talking to patients.*"

Furthermore, poor operation of clinical practice, characterised by the unsystematic management of student practice and unwelcome atmosphere at the practice sites, contributed to the participants' dissatisfaction with the clinical practice curricula.

When I went to the clinical practice, staff in practice sites often didn't know that GNP students were coming to the practice due to poor communication among the staff within the practice site. In clinical practice at a hospital, physicians mainly guided us with enthusiasm. However, fellow physicians often asked 'who are they?' pointing to us, and then we felt a little intimidated.

Other minor comments about the negative aspects of the GNP programme curricula included questionable usefulness of nursing theory and nursing research courses, different educational contents in educational institutions, and lack of up-to-date information on the GNP certification examination.

3) Suggestions to Improve the Quality of GNP Programme Curricula

The participants proposed three main suggestions to improve the quality of the GNP programme curricula: (a) enhancement of education in core courses; (b) strengthening the contents of gerontological nursing didactic courses; and (c) quality improvement of clinical practice education for geriatric nurses. This domain consists of three categories and eight subcategories.

(1) Enhancement of education in core courses

The participants reported that it would be better for the educational content of certain core courses to be delivered in the context of elder care. To develop and strengthen their clinical capabilities as GNPs, the participants believed that pathophysiology and pharmacology courses should comprise aging-related changes. Particularly, the advanced health assessment course needs to have more intensified and gerontological nursing-related content than the undergraduate health assessment course.

[Rather than separately learning basic science such as pathophysiology and pharmacology] Wouldn't it be helpful to integrate the content of pathophysiology and pharmacology into the Advanced Gerontological Nursing for Healthy Aging course and explain pathophysiology and pharmacology by diseases common in older adults in detail and comprehensively?

Moreover, participants recommended that pathophysiology and pharmacology courses reflect real-life clinical practice. For example, one participant articulated that it would be more practical to review medications that a certain older patient took to manage his/her medical problems, with a focus on their mechanisms, how to prescribe them, and common side effects. Thereby, the participants thought that they might be able to apply the knowledge attained from the basic medical science courses to clinical practice better.

I think drug reviews are important…… The content of pharmacology is currently too general. ……In the pharmacology class, if we review a list of drugs that the patient is actually taking in consideration of the patient's disease state and clinical symptoms, we would be able to learn which drugs should be continued, stopped, or switched to different drugs.

Some participants suggested the inclusion of additional content on professional skills for communication, administration and planning, and education in core courses to strengthen their competence as GNPs. Specifically, effective communication and presentation skills, and the capacity to develop educational programmes for older adults, families, or other professionals were mentioned.

Preparing, planning, or creating an educational programme related to elder care requires a lot of thought and efforts. I must

set up an education schedule, a type of audience, instructors to invite, and a place to increase the effectiveness of education... I think I need some experience [in preparing, planning, or creating educational programmes] to develop my capacity of administration, planning, and education as a GNP.

(2) Strengthening the contents of gerontological nursing didactic courses

Participants stated that, in order to provide better health management for older adults as a GNP, the specialty-related didactic courses should address older adults' common health problems, management approaches, medical welfare services, and the latest elder care trends more comprehensively and intensely. Regarding the older adults' common health problems and management, participants thought that the deep understanding of key features of geriatric diseases and conditions (especially, dementia) and strategies to respond to medical emergencies of older adults are particularly imperative. Thus, they articulated the need of more education on such topics. For instance, one participant expressed, "*Isn't dementia-related education really lacking? I thought a lot about it. So, what if the dementia-related programme curricula was a little longer?*"

With regard to medical welfare services for older adults, participants wanted more content about the medical welfare services that were available for community-dwelling older adults after discharge from hospitals. In addition, some participants suggested more content regarding the establishment of nursing homes and the latest trends in elder care, such as new paradigms, technologies, and products related to gerontological nursing.

In my case, the most frequently asked question is about the affiliated hospitals which patients can go to after discharge because it is hard for older patients to take care of themselves on their own after discharge from a tertiary hospital. In connection with this, many people ask about national benefits, support, and subsidies that older adults can receive, and t other intermediate facilities, but there is little information about them...

(3) Quality improvement of clinical practice education

Participants strongly suggested the need for quality improvement in clinical practice to improve the GNP curriculum. For the quality improvement of clinical practice, most of the participants emphasised the importance of having clinical sites where they could observe the role of GNPs. For instance, one

participant stated, "*Wouldn't it have been more stimulating for me if I could go and see the place where they are playing the role of a GNP? I wish I hadn't felt that way.*"

Participants highlighted that various clinical sites should be available for GNP students to experience various types of elder care. Such clinical sites included geriatric wards in general hospitals, long-term care hospitals, long-term care centres (e.g., day-care centres for older adults), and nursing homes of diverse quality grades. Some participants mentioned that they had observed elder care that was provided in exclusive nursing homes or long-term care hospitals only, and therefore wished to experience elder care in moderate (or general) institutions that are more common.

The nursing home [which I went to for clinical practice] was of a very good standard. It was a nursing home where people with a bit of material freedom reside. It was a bit difficult to feel the inferiority of nursing facilities. I wonder what it would be like to have clinical practice in nursing homes that are common around us or where marginalised older adults reside.

DISCUSSION

As a result of analysing the interviews in this study, four main positive and negative aspects of the current GNP programme curricula emerged. Although the participants were able to obtain the knowledge and skills related to elder care from the GNP curricula and apply them into their practice, the quality of gerontological nursing-related didactic and clinical courses was questionable. As participants stated, it is necessary to enhance education in core courses and gerontological nursing didactic courses (e.g., a strong focus on gerontological nursing), improve the quality of clinical practice, and diversify types of clinical practice sites (e.g., clinical sites where GNP students can observe the role of GNPs). The study findings also indicate that the GNP programme curricula should actively reflect the opinions of educators, policymakers, and GNPs in the clinical fields in order to provide high-quality education and training to students in GNP programmes.

In this study, the GNP programme curricula provided the participants with an opportunity to intensively learn about geriatric diseases and atypical/non-specific responses of older adults to illnesses and cultivate an inclusive attitude towards older adults. This finding is consistent with those of previous studies that greater knowledge of the physical, psychological,

and social features of older adults leads to more positive attitudes of nurses towards older adults [15,16] and that long-term care hospital nurses' knowledge of the older population and their nursing performance improved after the receipt of education on gerontological nursing [17]. Professional knowledge about elder care and an inclusive attitude towards older adults are important for providing professional geriatric care, and the GNP programme curricula contribute to the development of these competencies.

This study presented that one of the main problems of the current GNP programme curricula in general was ineffective and suboptimal operation of clinical practice for GNP students that was characterised by the lack of GNP preceptors or role models for the GNP students, limited clinical sites, and the unwelcome atmosphere in the available clinical sites. Moreover, the participants emphasised the necessity of improving the quality of clinical practice in GNP education by correcting such deficiencies. The lack of systematic guidance due to a lack of GNP preceptors or roles models at clinical sites has been identified previously [9,18]. In a survey of APN students, professors, and nursing administrators in APN programmes regarding the status of preceptors for practical guidance, nurses who were not APNs or physicians at clinical sites were seen to act as preceptors [19]. In the case of physician preceptors, the participants found it difficult to acquire the role of an APN because physician preceptors focused on the content that was necessary to train physicians [19]. In the United States, when the lack of qualified preceptors and limited clinical sites for NPs students became big issues, there were several suggestions to resolve these issues, including a review (evaluation) of existing clinical practice, use of simulation education to maximise the effect of clinical practice, expansion of clinical practice to geriatric hospitals and long-term care facilities, and interprofessional education [20]. In Taiwan, the APN students learned and improved their interpersonal and communication skills by interviewing standardized patients [21]. As Korea experiences a similar shortage of GNP preceptors and clinical sites, simulation, interdisciplinary education, and expansion of clinical practice to long-term care centres and hospitals and dementia centres may prove realistic alternatives. Moreover, for ensuring quality of practice, stringent criteria for clinical preceptors and more discussions and strategies to increase GNP positions in healthcare institutions are necessary.

In this study, the lack of didactic content for cultivating expertise in gerontological nursing as a GNP was considered an area for improvement. This finding is consistent with that of a previous study which found that the GNP programme curricula did not significantly differ from the undergraduate curriculum and did not correspond to an advanced level of knowledge and skills [19]. Particularly, this study showed that despite the presence of the 'Elderly Welfare Nursing' course as one of the major didactic courses, the educational content on social and medical welfare and long-term care services for older adults was insufficient. This finding indicates that though the 'Elderly Welfare Nursing' course aims to provide an understanding of policies that are related to the welfare for older adults and to integrate gerontological nursing and welfare [22], the course does not include the content that nurses actually require in clinical practice. Thus, through periodic evaluations with GNP students, GNPs, RNs, and other professionals who provide elder care in clinical practice, the educators should continually evaluate the content of major didactic courses and address the educational needs of GNPs and nurses in practice. Additionally, utilising electronic learning resources (e.g., podcasts, case studies, educational videos) may be useful in providing self-learning materials to students and improving the quality of lectures [23].

Besides the improvement of gerontological nursing-related didactic and clinical education, the enhancement of the education in core courses (e.g., pharmacology, pathophysiology, advanced health assessment) was one of the suggestions of the participants in this study. To enhance such education, core courses need to reflect aging-related changes and elder care. This suggestion is in line with the opinion of Oh et al. [19] that core courses need to be included in consideration of the APNs' specialty. In the real-world scenario, GNP students often take the core courses with students from other APN programmes as the course contents overlap across specialties. To facilitate students' learning in the core courses while reflecting their specialty, educators need to devise innovative and practical strategies for imparting knowledge. Having group activity sessions wherein GNP students review the medications that are prescribed, the pathophysiology of geriatric diseases diagnosed, and health assessments in specific scenarios involving older patients, while taking core courses with other APN students, may be helpful to meet their educational needs.

This study has several limitations. Although educational institutions follow the standard curriculum that the Korean Accreditation Board of Nursing Education presents, the educational content and programme operation may vary across edu-

cational institutions. This variability may not be revealed in our findings as the sample size is small and not representative of all the GNP programmes. Most participants were working in secondary or tertiary general hospitals, and their perceptions might have differed from those of nurses working at long-term care institutions. As we recruited only nurses who were GNP certified, the programme educators' and other stakeholders' opinions, which are necessary to evaluate the GNP programme curricula comprehensively, were not explored. Despite these limitations, this study was one of the few studies that looked into the quality of GNP education in South Korea.

CONCLUSION

This qualitative descriptive study identified positive and negative aspects of the GNP programme curricula and suggestions to improve the curricula. The findings presented herein may provide a fundamental framework for developing practical strategies to improve the quality of GNP education. Based on the study's findings, we suggest the following: (a) incorporation of the opinions of healthcare providers, including GNPs, nurses, and other relevant professionals, to reorganise the GNP programme curricula and to advance GNP students' knowledge and skills in elder care; (b) evaluation of students' satisfaction with their GNP programmes on a regular basis; (c) surveys that target all GNP educational institutions to systematically describe and examine variability in the educational content and programme operation; and (d) surveys to identify the professional status of GNP programme graduates and the status of GNPs by clinical field type to explore GNPs' roles in clinical settings and to evaluate the efficiency and effectiveness of GNP performance on patient outcomes.

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Authors' contribution

Study conceptualization and methodolohy - JP and HK; Data collection - JP; Data analysis and interpretation - JP and HK; Drafting and critical revisions of the manuscript - JP & HK; Supervision - HK; All authors have read and agreed to the published version of the manuscript.

Conflict of interest

Hyejin Kim has been associate editor of the Journal of Korean Gerontological Nursing since January 2021. She was not involved in the review process of this manuscript. Otherwise, there was no existing or potential conflict of interest relevant to this article was reported.

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Data availability

Please contact the corresponding author for data availability.

Acknowledgements

REFERENCES

1. Statistics Korea. The future population estimates: 2020~2070 [Internet]. Statistics Korea; 2021 Dec 9 [cited 2022 Aug 25]. Available from: https://kostat.go.kr/board.es?mid=a10301020600&bid=207&act=view&list_no=415453

2. Korean Nurses Association. Becoming an advanced practice nurse [Internet]. Korean Nurses Association; [cited 2021 Nov 10]. Available from: https://www.koreanurse.or.kr/resources/be_specialist.php

3. Ministry of Health and Welfare. Health and welfare statistical year book 2022: Health Care Personnel [Internet]. Ministry of Health and Welfare; 2022 Dec 28 [cited 2023 Jun 28]. Available from: https://www.mohw.go.kr/react/jb/sjb030301vw.jsp

4. Korean Accreditation Board of Nursing Education. Designation and management of educational institutions for professional nurses [Internet]. Korean Accreditation Board of Nursing Education; 2023 Mar [cited 2021 Nov 20]. Available from: http://www.kabone.or.kr/mainbusin/nurse03outline.do

5. Council of Gerontological Nurse Practitioner Programme Curricula. Revision of the standard curriculum for the Ge-

rontological Nurse Practitioner. Report for Gerontological Nurse Practitioner Programme Curricula Revision. Council of Gerontological Nurse Practitioner Programme Curricula; 2021 October 12.

6. Lee KJ, Kong ES, Kim NC, Kim JH, Kim CG, Kim HK, et al. Roles and functions of the gerontological nurse practitioner. Journal of Korean Gerontological Nursing. 2004; 6(1):125-33.

7. Korean Accreditation Board of Nursing Education. Notification; 2022 Newsletter [Internet]. Korean Accreditation Board of Nursing Education; 2023 Mar 31 [cited 2023 Jul 20]. Available from: http://www.kabone.or.kr/notice/newsletter.do

8. Korean Accreditation Board of Nursing Education. Quality management of advanced practice nurse education institutions [Internet]. Korean Accreditation Board of Nursing Education; 2022 Mar [cited 2022 Apr 15]. Available from: https://www.kabone.or.kr/mainbusin/nurse03perform.do

9. Shin S, Jung D, Kim H. Students' satisfaction on GNP Educational Program. Journal of Korean Gerontological Nursing. 2014;16(1):1-8. https://doi.org/10.17079/jkgn.2014. 16.1.1

10. Korean Law Information Center. Rule of the advanced practice nurses' qualification [Internet]. Ministry of Health and Welfare; 2022 Apr 19 [cited 2022 May 20]. Available from: https://www.law.go.kr/lumLsLinkPop.do?lspttninf Seq=61761&chrClsCd=010202

11. Sandelowski M. Whatever happened to qualitative description? Research in Nursing & Health. 2000;23(4):334-40. https://doi.org/10.1002/1098-240x(200008)23:4<334::aid-nur9>3.0.co;2-g

12. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. Qualitative Health Research. 2005;15(9): 1277-88. https://doi.org/10.1177/1049732305276687

13. Lincoln YS, Guba EG. Naturalistic inquiry Sage Publications; 1985. p. 289-331.

14. Na J. A review on verification strategies for qualitative research: focusing on member check, peer debrief, and audit trail. Educational Research. 2017;70:233-54. https://doi.org/10.17253/swueri.2017.70..009

15. Kwon Y, Lee HY, Hwang SS. A study on the knowledge, attitude and nursing practice of the nurses-towards the elderly in geriatric hospitals. Journal of the Korea Academia-Industrial Cooperation Society. 2013;14(11):5785-91. https://doi.org/10.5762/kais.2013.14.11.5785

16. Liu YE, Norman IJ, While AE. Nurses' attitudes towards older people: a systematic review. International Journal of Nursing Studies. 2013;50(9):1271-82. https://doi.org/10. 1016/j.ijnurstu.2012.11.021

17. Choi KB. The effect of elderly nursing care education programs on nurses' knowledge, attitudes, and nursing performance toward the elderly. The Journal of Korean Academic Society of Nursing Education. 2012;18(3):522-32. https://doi.org/10.5977/jkasne.2012.18.3.522

18. Ryu HS, Oh PJ, Lim JY, Kang HS, Yang SH, Seomun GA, et al. Needs of training programs for practice courses in advanced practice nurse education. Journal of Korean Academy of Nursing Administration. 2007;13(4):553-61.

19. Oh K, Kim KM, Kim KS, Park JW, Sung MS, Oh EG, et al. Educational issues and strategies to improve APN education. Journal of Korean Academy of Nursing. 2007;37(5): 801-9. https://doi.org/10.4040/jkan.2007.37.5.801

20. Drayton-Brooks SM, Gray PA, Turner NP, Newland JA. Building clinical education training capacity in nurse practitioner programs. Journal of Professional Nursing. 2017; 33(6):422-8. https://doi.org/10.1016/j.profnurs.2017.02.002

21. Lin EC, Chen SL, Chao SY, Chen YC. Using standardized patient with immediate feedback and group discussion to teach interpersonal and communication skills to advanced practice nursing students. Nurse Education Today. 2013; 33(6): 677-83. https://doi.org/10.1016/j.nedt.2012.07.002

22. American Nurses Credentialing Center. Adult-Gerontology Primary Care Nurse Practitioner Certification [Internet]. American Nurses Credentialing Center; [cited 2022 Mar 12]. Available from: https://www.nursingworld.org/our-certifications/adult-gerontology-primary-care-nurse-practitioner/

23. Thompson HJ, Belza B, Baker M, Christianson P, Doorenbos A, Nguyen H. Identifying and evaluating electronic learning resources for use in adult-gerontology nurse practitioner education. Journal of Professional Nursing. 2014; 30(2): 155-61. https://doi.org/10.1016/j.profnurs.2013.08. 004

Health-related quality of life for older patients with chronic low back pain: A structural equation modeling study

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Purpose: This study aimed to develop and validate a structural equation model for health-related quality of life in older patients with chronic low back pain. **Methods:** We selected social support, symptoms, fear-avoidance beliefs, functional disability, health perception, and health-related quality of life as the main variables based on Wilson and Cleary's model of health-related quality of life. A total of 211 participants aged ≥65 years who had been diagnosed with low back pain for more than three months were considered in this study. Data were collected from two hospitals in D Metropolitan City and A City, one public health center, and two senior citizen centers. We utilized SPSS/WIN 24.0 and R package 'plspm' (R Version 3.1.3) for data analysis. **Results:** The overall fit of the proposed hypothesized model was .53, which met the acceptable threshold, confirming the adequacy of the model's fit. Social support, symptoms, fear-avoidance beliefs, functional disability, and health perception were statistically significant variables in the health-related quality of life, and the explanatory power of these variables was 75.1%. Out of the 15 hypotheses in the model, 13 hypotheses were supported. **Conclusion:** The model showed 12 significant direct effects, one significant indirect effect, and 13 significant total effects (both direct and indirect). To enhance the health-related quality of life in older patients with chronic low back pain, alleviating fear-avoidance beliefs and functional disability is necessary, and improving positive social resources such as social support and health perception is essential.

Keywords: Chronic low back pain; Health-related quality of life; Structural equation modeling

INTRODUCTION

The proportion of people aged ≥65 years in South Korea is expected to reach 25.5% by 2030 [1]. Consequently, chronic diseases among older adults are predicted to become increasingly important social issues in the near future. In particular, the prevalence of chronic low back pain among older adults was reported to be 24.1% in 2017 and 10.0% in 2020 [2]. Chronic pain in older adults often persists for a long period, leading to negative psychological states and functional impairments in daily life, ultimately reducing their quality of life and functional abilities [3].

Quality of life is a multidimensional and extensive concept that includes an individual's subjective evaluation of satisfaction or dissatisfaction with functional abilities in life [4]. The quality of life of patients with chronic pain is influenced by the interaction of physical and psychological symptoms caused by back pain, as well as the social environment [5]. Although various studies have described models of quality of life, the factors that affect quality of life are wide-ranging, and the effects vary depending on the disease [6-8]. Therefore, it is necessary to identify the factors that affect quality of life according to the characteristics of the disease and to understand the relationship between these factors.

The fear-avoidance beliefs arising from physical and psychological symptoms of chronic low back pain significantly influence the deterioration of the quality of life in older patients with chronic low back pain [9]. Fear-avoidance beliefs are disease-specific factors more common in patients with chronic low back pain than in those with other chronic illnesses [9]. These beliefs are based on the internalized notion that physical activity and daily life worsen pain [10]. Furthermore, patients with chronic pain who experience pain as the primary symptom further strengthen these beliefs, avoiding physical activity and worsening their physical functional state, thereby reducing their quality of life [11]. Therefore, to establish a model of quality of life for patients with chronic pain, it is necessary to consider the characteristics of the disease and to verify the relationship between fear-avoidance beliefs and various factors affecting quality of life within the model.

Wilson and Cleary's health-related quality of life model [12] explains the relationship between various dimensions of health-related quality of life, including physical, psychological, social, and environmental aspects. Wilson and Cleary's model of health-related quality of life is an essential framework for health assessment, evaluating the overall quality of life (Figure 1). This model is an important measure of health evaluation and evaluates the overall quality of life. It also categorizes physiological factors, symptoms, functional status, health perceptions, and characteristics of quality of life while establishing relationships with the patient's personal and environmental characteristics. By analyzing the causal relationships between these variables, it measures health-related quality of life. Quality of life studies based on Wilson and Cleary's model have been widely used, both domestically and internationally, for patients with chronic diseases, patients with cancer, and patients who

Figure 1. Wilson and Cleary's model of health–related quality of life [12].

have undergone surgery [6-8,13,14]. These studies have shown that quality of life varies depending on the characteristics of the disease and the environment, and is influenced by various factors.

In most studies, when targeting individuals with chronic illnesses, the elderly, or patients with back pain, researchers have established the theoretical framework by adding key variables and excluding less relevant ones [6-8]. However, it was challenging to find studies specifically targeting older patients with chronic low back pain. Therefore, it is necessary to examine the relationship between chronic pain in older adults and their quality of life, taking in to account the disease characteristics of chronic pain, based on Wilson and Cleary's health-related quality of life model. The symptoms described by Wilson and Cleary's model, such as pain [15] and depression [16], are also present in chronic pain of older adults, which can worsen functional disabilities [15] and reduce quality of life [17]. Social support [6-8] and health perception [18], which are environmental characteristics presented in Wilson and Cleary's model, have been shown to be related to the quality of life of patients with chronic diseases; however, research on chronic pain of older adults is still insufficient.

Studies targeting older adults with chronic pain [6], and studies focusing on patients with chronic pain [15], have also reported that as pain severity increases, the quality of life decreases. However, research specifically addressing the quality of life of older adults with chronic pain remains limited. Environmental characteristics such as social support can lead to positive health outcomes and improve quality of life, and health perception based on how one perceives their illness is an important factor affecting quality of life. Therefore, to provide reasonable evidence for the causal relationships between quality of life factors and chronic pain in older adults, it is necessary to consider the complex factors of pain, depression, functional disabilities, health perception, and environmental characteristics such as social support, in the quality of life model. Additionally, because fear-avoidance beliefs reflect the characteristics of patients with chronic pain, it is necessary to consider them in the quality of life model.

The conceptual model of this study expanded on Wilson and Cleary's health-related quality of life model by adding fear-avoidance beliefs to the four domains of environmental characteristics, symptoms, functional status, and health perceptions. In total, five domains were examined to identify the factors influencing the quality of life (Figure 2). Therefore, we
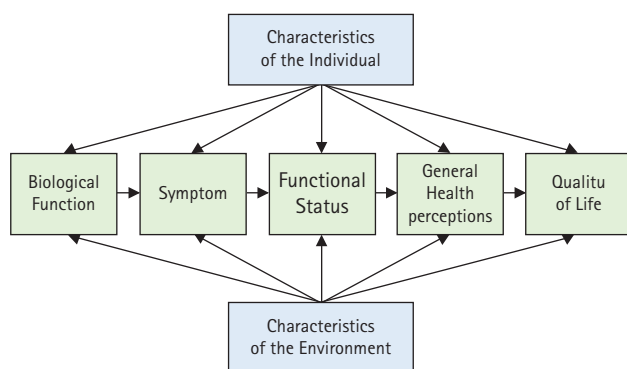
aim to construct a hypothetical model of health-related quality of life in older patients with chronic low back pain and validate it through research findings. The results of this study will serve as the theoretical groundwork for research on health-related quality of life in older patients with chronic low back pain. They will also be utilized as evidence for proposing nursing interventions that consider both physical and psychological factors among the subjects, as well as for developing programs aimed at improving the quality of life for older patients with chronic low back pain.

METHODS

Ethic statement: This study was approved by the Institutional Review Board (IRB) of Keimyung University (IRB No.: 40525-202002-HR-086-02). Informed consent was obtained from the participants.

1. Study Design

The objective of this research was to create and verify the structural equation model that captures the impact on the health-related quality of life in older patients who are dealing with chronic low back pain.

2. Participants

Older patients with chronic back pain who visited two hospitals in D metropolitan city and A city, one public health center, and two senior citizen centers, who agreed to participate and met the following selection criteria, were included in this study: 1) aged ≥65 years with a diagnosis of low back pain; 2) low back pain symptoms lasting for more than 3 months; 3) capable of understanding the questionnaire with no psychiatric diagnoses.

Prior to conducting the survey, participants were instructed to provide information about their age, the presence or absence of low back pain, and any history of psychiatric diseases in the questionnaire. We collected data from June 15, 2020, to August 30, 2020. The minimum required sample size for conducting a Partial Least Squares (PLS) structural equation modeling analysis is 10 times the number of measurement variables. Since this study included 20 measurement variables, the recommended minimum sample size was 200. Considering the possibility of dropouts, 220 questionnaires were distributed for this study, and we excluded inconsistent response results from the data analysis. Finally, 211 questionnaires were used for the data analysis. The sample size used for analysis was therefore deemed appropriate [19].

3. Measurements

1) Social support

Social support was measured using a tool adapted by Lim [20], which is based on the Social Support Tool developed by Sherbourne and Stewart [21] for chronic diseases. This tool

Figure 2. Theoretical model of health-related quality of life by Wilson and Cleary [12].

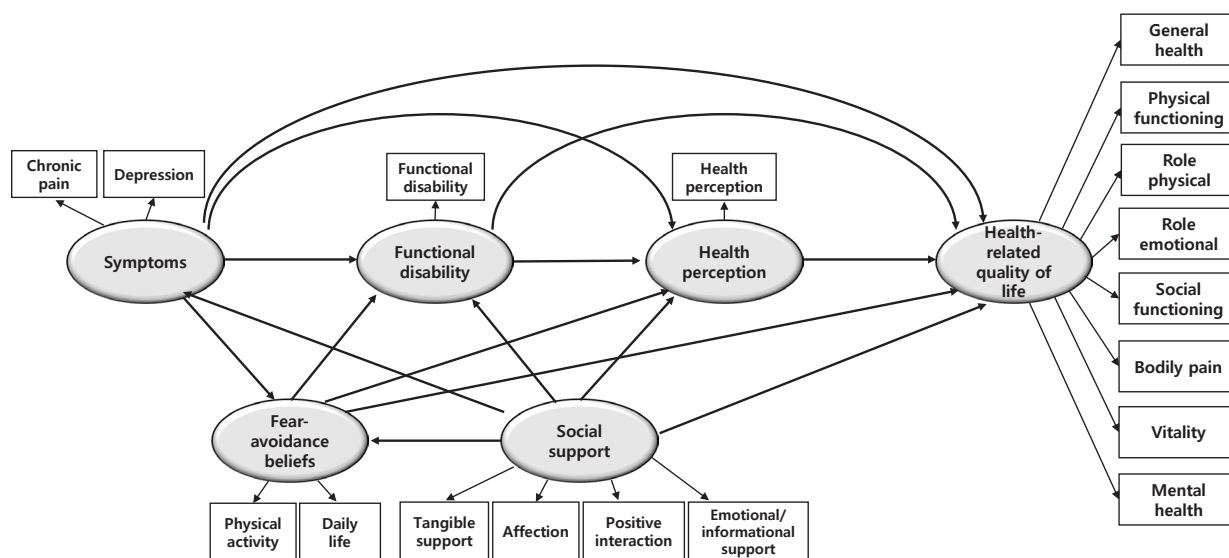consists of four subdomains: tangible support (four items), affection (three items), positive interaction (three items), and emotional/informational support (eight items). The tool uses a 5-point Likert scale ranging from "not at all" (1 point) to "always" (5 points), with higher scores indicating higher levels of social support. The tool has a high reliability with a Cronbach's α of .97. In this study, the overall Cronbach's α was .95, and that for each sub-domain was: .86 for tangible support, .85 for affection, .88 for positive interaction, and .92 for emotional/ informational support.

2) Chronic pain

To measure chronic pain, a chronic pain tool developed by Von Korff et al. [22] to measure pain lasting three months or longer, such as low back pain and headaches, was used. We translated this tool into Korean according to the recommendations by Beaton et al. [23]. The tool consists of seven items and three subscales: duration of pain, intensity of pain, and disability caused by pain. Six of the items were scored on a 0~10 scale and the remaining item was scored on a 0~3 scale. In the Disability Score, scores ranging from 0 to 29 points are categorized as 0 points, scores from 30 to 49 points are categorized as 1 point, scores from 50 to 69 points are categorized as 2 points, and scores of 70 points or above are categorized as 3 points. Each score is then recalculated on a 0 to 3 point scale. Higher scores indicated more severe chronic pain. The tool originally had a Cronbach's α of .74, and Smith et al. [24], using the same tool, reported a Cronbach's α of .91. In this study, the Cronbach's α was .89.

3) Depression

The Korean version of the depression scale shortened tool, translated by Kee [25] from Sheikh and Yesavage's [26] depression scale tool, was used to measure the degree of depression in older adults. The tool consists of 15 questions using a binary scale ('yes' or 'no'), with scores ranging from 0 to 15; higher scores indicate more severe depression. The Cronbach's α reliability coefficient was .95 when the tool was developed, and .87 in this study.

4) Fear-avoidance beliefs

We measured fear-avoidance beliefs using the fear-avoidance belief questionnaire developed by Waddell et al. [27]. Based on the translational guidelines provided by Beaton et al. [23], we have completed the translation of this tool into Korean. This

tool is composed of 16 questions and two subscales measuring fear-avoidance beliefs related to physical activity and daily life. Responses were measured on a 7-point Likert scale ranging from 0 ('completely disagree') to 6 ('completely agree'), with higher scores indicating greater fear-avoidance beliefs. When the tool was developed, Cronbach's α reliability coefficients were .88 for fear-avoidance beliefs related to physical activity and .77 for fear-avoidance beliefs related to daily life. In this study, the overall Cronbach's α was .78, and the Cronbach's α coefficients for the subscales of fear-avoidance beliefs related to physical activity and daily life were .76 and .79, respectively.

5) Functional disabilities

To measure functional disability, the tool developed by Fairbank et al. [28] and modified and supplemented by Jeon et al. [29] was used. This tool consists of 10 items: pain intensity, personal hygiene, lifting, walking, sitting, standing, sleeping, sexual activity, social activity, and travel. In this study, sexual activity was excluded to account for participants without spouses, and the measurement tool consisted of nine items. Higher scores indicate more severe functional disabilities. Cronbach's α reliability coefficient was .85 when the tool was developed, .93 in Jeon et al.'s study [29], and .89 in this study.

6) Health perception

Health perception was measured using a tool developed by Ware [30], which was translated by Yoo et al. [31] and modified for use with older patients by Lee and Chung [32]. The tool consists of 20 questions in six subscales: current health, prior health, health outlook, health worry and concern, resistance-susceptibility, and rejection of sick role. Responses were measured on a 4-point Likert scale ranging from 1 ('completely disagree') to 4 ('completely agree'), with scores ranging from 20 to 80. Higher scores indicated greater health perception. The Cronbach's α reliability coefficient was .91 when the tool was developed, and .62 in Yoo et al.'s [31] study, .85 in Lee and Chung's study [32], and .86 in this study.

7) Health-related quality of life

Health-related quality of life was measured using The Medical Outcomes Study 36-Item Short Form Health Survey Instrument Version II developed by Ware et al. [33]. The tool consists of 36 items, including one item measuring changes in health status and 35 items measuring health-related quality of life, with eight subscales: physical functioning (10 items), role

physical (four items), bodily pain (two items), general health (five items), vitality (four items), social functioning (two items), role emotional (three items), and mental health (five items). Scores were calculated by assigning weights to each response and summing them to obtain a total score, which was then converted to a 0~100 scale, excluding one item that measured changes in health status. Higher scores indicated a higher health-related quality of life. When the tool was developed, the Cronbach's α reliability coefficients for the eight subscales were .78 to .93. In this study, the overall Cronbach's α was .86, and the Cronbach's α coefficients for the subscales of physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotion, and mental health were .85, .86, .80, .82, .75, .76, .81, and .77, respectively.

4. Data Analysis

The measured data were analyzed using SPSS/WIN 24.0 (IBM Corp.) and the R package 'plspm' (R Version 3.1.3). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to analyze the general characteristics of the participants and each variable. The differences in health-related quality of life for the general characteristics were analyzed using t-tests and ANOVA. Data analysis using PLS structural equation modeling was divided into two stages: measurement model analysis and structural model analysis. The reliability of the measurement indicators was assessed using Cronbach's α, which measures internal consistency and composite reliability.

The goodness-of-fit of the hypothesized model was verified with the following indices: Cronbach's α ranged from .70 to .95, composite reliability ranged from .82 to .97, factor loading ranged from .65 to .96, average variance extracted index ranged from .51 to .87, Fornell-Larcker criterion, model's coefficient of determination (R^2) ranged from .24 to .75, redundancy values ranged from .03 to .37, and the overall model fit was .53, which met the acceptable threshold, confirming the adequacy of the model's fit.

5. Ethical Considerations

After obtaining approval from the IRB at Keimyung University (IRB No.: 40525-202002-HR-086-02), data collection for this study began. Data collection involved obtaining consent from the responsible departments of hospitals, public health centers, and senior centers. After obtaining consent, voluntary participation of the subjects was initiated, and they provided written consent for the study. The survey took approximately 20 minutes to complete, and all participants in the study were provided with appropriate tokens of appreciation.

RESULTS

1. General and Disease Characteristics of the Participants

Of the 211 participants included in this study, 63.0% were female and 37.0% were male. The mean age was 72.2±5.97 years, with 70.1% and 26.5% of participants in the age range of 65~74 and 75~84 years, respectively. In terms of marital status, 59.2% were married and 29.9% were widowed; 50.7% lived with their spouses and 28.9% lived alone. Regarding the education level, the proportion was highest for individuals who were high school graduates (31.3%) and those who had less than elementary school education (25.1%). Regarding religion, 39.8% of the participants had no religion and 37.4% were Buddhists. In terms of economic status, 64.5% of the participants were in the middle economic class. Differences in health-related quality of life were found to be related to marital status (F=6.36, p=.002), living arrangements (F=8.72, p<.001), educational level (F=7.75, p<.001), and economic status (F=7.49, p<.001). Post hoc analysis showed that health-related quality of life was higher among unmarried and married individuals than among widowed individuals. Participants living with a spouse or children/others had a higher health-related quality of life than those living alone. At the education level, the groups with high school and college or higher education showed higher health-related quality of life than the elementary or middle school groups. Participants in the middle or high economic classes had a higher health-related quality of life than those in the low economic class (Table 1).

In terms of disease characteristics, 31.3% of the participants had an illness duration of >10 years. Furthermore, regarding the frequency of low back pain, 38.9% felt it occasionally and 22.3% experienced low back pain 3~4 times per week. Regarding the pattern of low back pain, 36.0% of the participants experienced severe pain with movement and 15.6% reported that the pain worsened at night. The causes of back pain were aging (39.8%) and occupational factors (22.3%). The types of treatment included medication (49.3%) and physical therapy

Table 1. Demographic Characteristics and Statistical Analysis of Health-Related Quality of Life (*N*=211)

Variable	Category	n (%)	Health-related quality of life	
			Mean±SD	t of F (*p*), Scheffe
Sex	Male	78 (37.0)	42.81±14.74	–1.62 (.123)
	Female	133 (63.0)	40.18±15.80	
Age (year)	65~74	148 (70.1)	41.65±13.51	–1.62 (.123)
	75~84	56 (26.5)	41.34±16.13	
	85 or over	7 (3.3)	39.14±21.96	
Marital status	Unmarried[a]	23 (10.9)	47.08±9.29	6.36 (.002), c<a,b
	Married[b]	125 (59.2)	42.84±15.50	
	Widowed[c]	63 (29.9)	34.38±15.71	
Living arrangement	Living alone[a]	61 (28.9)	34.40±12.66	8.72 (<.001), a<b,c,d
	With spouse[b]	107 (50.7)	43.44±14.94	
	With children[c]	27 (12.8)	43.00±15.29	
	Other[d]	16 (7.6)	49.87±15.55	
Education level	Less than elementary school[a]	53 (25.1)	32.00±9.26	7.75 (<.001), a,b<c,d
	Middle school[b]	61 (28.9)	37.86±14.68	
	High school[c]	66 (31.3)	46.86±12.87	
	College or higher[d]	31 (14.7)	52.00±13.32	
Economic status	High[a]	16 (7.6)	40.00±7.32	7.49 (<.001), c<a,b
	Middle[b]	136 (64.5)	45.04±13.91	
	Low[c]	59 (28.0)	32.84±16.23	

The sum of the percentages does not equal 100% because of rounding. SD=Standard deviation.

(26.1%). Of the respondents, 63.5% reported experiencing treatment effects and 27.5% reported worsening back pain when bending forward. Of the patients, 77.7% had other chronic diseases and 78.2% had no history of surgery for low back pain. Significant differences were observed in health-related quality of life depending on the duration of symptoms (F=7.81, *p*<.001), frequency of low back pain (F=8.59, *p*<.001), low back pain patterns (F=5.51, *p*<.001), therapeutic effect (t=2.83, *p*<.001), presence of other chronic conditions (t=10.98, *p*<.001), and surgical history (t=6.95, *p*=.009). Post-hoc analysis showed that health-related quality of life was higher in groups with symptom duration of <1 year, 1~3 years, 3~5 years, and 5~10 years, than in the group with symptom duration of >10 years. Health-related quality of life was higher in the groups experiencing low back pain 1~2 times per week or occasionally than in the group experiencing it daily (Table 2).

2. Fit Analysis of the Structural Model

In the structural model analysis, fit analysis involves evaluating the coefficient of determination R^2, the redundancy values in the structural model, and the overall model fit. The coefficient of determination R^2 assesses the explanatory power of the latent variables, and higher values indicate greater explanatory power. Redundancy values are statistical estimators in the structural equation modeling, and positive values indicate a good fit of the structural model. Lastly, the overall model fit should be at least .10 or higher, with values between .25 and .36 considered as moderate fit and values between .10 and .25 as weak fit.

In this study, the fit analysis of the structural model revealed positive redundancy values for all latent variables. Additionally, the coefficient of determination R^2 showed explanatory power for symptoms (.24), fear-avoidance beliefs (.20), health perception (.44), and functional disability (.64), while the dependent variable, health-related quality of life, had an R^2 of .75, indicating a high explanatory power. The overall model fit was .53, validating the appropriateness of the proposed structural model in this study.

3. Descriptive Statistics of Variables

In this study, there were significant negative correlations between health-related quality of life and symptoms, fear-avoidance beliefs, and functional disability. Additionally, health-related quality of life showed positive correlations with social support (r=.37, *p*<.001) and health perception (r=.59, *p*<.001), indicating consistent and expected directional relationships

Table 2. Health-Related Quality of Life by Disease Characteristics (*N*=211)

Characteristic	Category	n (%)	Health-related quality of life	
			Mean±SD	t or F (*p*), Scheffe
Duration of symptom (year)	≥1[a]	34 (16.1)	46.12±15.53	7.81 (<.001), e<a,b,c,d
	<1 to ≤3[b]	41 (19.4)	49.26±14.68	
	<3 to ≤5[c]	29 (13.7)	46.62±13.45	
	<5 to ≤10[d]	41 (19.4)	45.65±10.20	
	>10[e]	66 (31.3)	34.12±15.19	
Frequency of low back pain	Daily[a]	52 (24.6)	34.03±14.30	8.59 (<.001), a<c,d
	3~4 times per week[b]	47 (22.3)	41.40±13.73	
	1~2 times per week[c]	30 (14.2)	39.40±15.18	
	Occasionally[d]	82 (38.9)	45.02±14.51	
Low back pain patterns	Pain throughout the day[a]	61 (28.9)	34.85±13.67	5.51 (<.001), a,c<b,d,e
	Pain in the morning or afternoon[b]	17 (8.1)	49.41±14.94	
	Pain worsens at night[c]	33 (15.6)	41.90±12.33	
	Pain worsens with movement[d]	76 (36.0)	42.90±15.17	
	Other[e]	24 (11.4)	47.66±15.88	
Low back pain causes	Accident/injury	18 (8.5)	29.88±15.94	4.13 (.147)
	Disease	21 (10.0)	37.76±13.59	
	Occupational	47 (22.3)	43.77±12.96	
	Aging	84 (39.8)	43.69±14.75	
	Unknown cause	41 (19.4)	31.80±15.42	
Treatment method	Medication	104 (49.3)	39.48±15.16	1.68 (.156)
	Physical therapy	55 (26.1)	43.69±15.85	
	Traditional Korean medicine	27 (12.8)	42.29±12.47	
	Other	25 (11.8)	43.96±13.27	
Therapeutic effect	Positive treatment effect	134 (63.5)	45.78±14.47	2.83 (<.001)
	Negative treatment effect	77 (36.5)	34.01±14.17	
Aggravating behaviors	When bending forward	58 (27.5)	39.20±14.65	.84 (.535)
	When leaning backwards	19 (9.0)	46.84±16.11	
	When changing position	27 (12.8)	42.59±15.30	
	When lying down	22 (10.4)	41.00±14.48	
	When sitting	20 (9.5)	39.35±15.92	
	When walking	30 (14.2)	40.46±11.68	
	When lifting objects	35 (16.6)	43.91±14.33	
Presence of other chronic conditions	Present	164 (77.7)	38.15±15.31	10.98 (<.001)
	Absent	47 (22.3)	45.20±14.76	
Surgery history for low back pain	Yes	46 (21.8)	36.26±14.99	6.95 (.009)
	No	165 (78.2)	42.94±15.25	

The sum of the percentages does not equal 100% because of rounding. SD=Standard deviation.

among the factors based on prior research, thus ensuring the construct validity (Table 3). The results of this study regarding the direct, indirect, and total effects of the different variables, as well as their statistical significance, are shown in Table 4 (Figure 3). *β* represents the standardized regression coefficient, which was used to calculate the effects and verify the statistical significance between exogenous and endogenous variables. In the path model, direct effects refer to the direct impact of independent variables on dependent variables, whereas indirect effects refer to the influence of independent variables on depen-

dent variables through one or more mediating variables. The total effect represents the sum of the direct and indirect effects. When interpreting the study results, it is important to consider not only direct effects, but also indirect and total effects, as it is difficult to accurately determine the effect size based on direct effects alone. We used the bootstrap method to investigate the direct, indirect, and total effects of the measured and endogenous variables. In this study, bootstrapping was performed 500 times.

When symptoms were selected as endogenous variables, so-

Table 3. Correlations Between Research Variables (*N*=211)

Research variable	r (*p*)					
	V1	V2	V3	V4	V5	V6
V1	1					
V2	−.25 (<.001)	1				
V3	−.39 (<.001)	.39 (<.001)	1			
V4	−.25 (<.001)	.58 (<.001)	.30 (<.001)	1		
V5	.39 (<.001)	−.43 (<.001)	−.63 (<.001)	−.49 (<.001)	1	
V6	.37 (<.001)	−57 (<.001)	−.24 (<.001)	−.78 (<.001)	.59 (<.001)	1

V1=Social support; V2=Symptoms; V3=Fear-avoidance beliefs; V4=Functional disability; V5=Health perception; V6=Health-related quality of life.

Table 4. Direct, Indirect, and Total Effect Analysis of Hypothetical Models (*N*=211)

Endogenous variable	Exogenous variable	β (*p*)			SMC*
		Direct effect (*p*)	Indirect effect (*p*)	Total effect (*p*)	
Symptoms	← Social support	−.49 (<.001)		−.49 (<.001)	.236
Fear-avoidance beliefs	← Social support	.21 (.125)	−.25 (.290)	−.04 (.371)	.200
	← Symptoms	.51 (<.001)		.51 (<.001)	
Functional disability	← Social support	−.28 (<.001)	−.19 (<.001)	−.47 (<.001)	.644
	← Symptoms	.36 (<.001)	.23 (<.001)	.58 (<.001)	
	← Fear-avoidance beliefs	.45 (<.001)		.45 (<.001)	
Health perception	← Social support	.22 (<.001)	.22 (<.001)	.43 (<.001)	.439
	← Symptoms	−.38 (<.001)	−.14 (<.001)	−.52 (<.001)	
	← Fear-avoidance beliefs	−.21 (<.001)	−.03 (<.001)	−.24 (<.001)	
	← Functional disability	−.06 (.473)		−.06 (.473)	
Health-related quality of life	← Social support	.09 (.075)	.37 (<.001)	.47 (<.001)	.751
	← Symptoms	−.32 (<.001)	−.37 (<.001)	−.69 (<.001)	
	← Fear-avoidance beliefs	−.23 (<.001)	−.17 (<.001)	−.39 (<.001)	
	← Functional disability	−.28 (<.001)	−.01 (<.001)	−.29 (<.001)	
	← Health perception	.18 (<.001)		.18 (<.001)	

* Squared multiple correlation; The overall fit of the model is .53.

cial support showed significant direct (β=−.49, *p*<.001) and total effects (β=−.49, *p*<.001) on symptoms, and accounted for 23.6% of the variance. When fear-avoidance beliefs were used as endogenous variables, social support showed no significant direct (β=.21, *p*=.125), indirect (β=−.25, *p*=.290), or total effects (β=−.04, *p*=.371) on catastrophic beliefs. However, symptoms had significant direct (β=.51, *p*<.001) and total effects (β=.51, *p*<.001) on fear-avoidance beliefs. The explanatory power of these variables for catastrophic beliefs was 20.0%. When functional disability was considered as the endogenous variable, social support showed significant direct (β=−.28, *p*<.001), indirect (β=−.19, *p*<.001), and total effects (β=−.47, *p*<.001) on functional disability. Symptoms had also significant direct (β=.36, *p*<.001), indirect (β=.23, *p*<.001), and total effects (β=.58, *p*<.001) on functional disability. Fear-avoidance beliefs had significant direct (β=.45, *p*<.001) and total effects (β=.45, *p*<.001)

on functional disability. Social support, symptoms, and fear-avoidance beliefs accounted for 64.4% of functional disabilities.

When health perception was used as an endogenous variable, social support showed statistically significant direct (β=.22, *p*<.001), indirect (β=.22, *p*<.001), and total effects (β=.43, *p*<.001) on health perception; likewise, symptoms also showed statistically significant direct (β=−.38, *p*<.001), indirect (β=−.14, *p*<.001), and total effects (β=−.52, *p*<.001). Fear-avoidance beliefs showed statistically significant direct (β=−.21, *p*<.001), indirect (β=−.03, *p*<.001), and total effects (β=−.24, *p*<.001) on health perception, while functional disability showed statistically significant direct (β=−.06, *p*=.473) and total effects (β=−.06, *p*=.473). Social support, symptoms, and fear-avoidance beliefs accounted for 43.9% of functional disabilities.
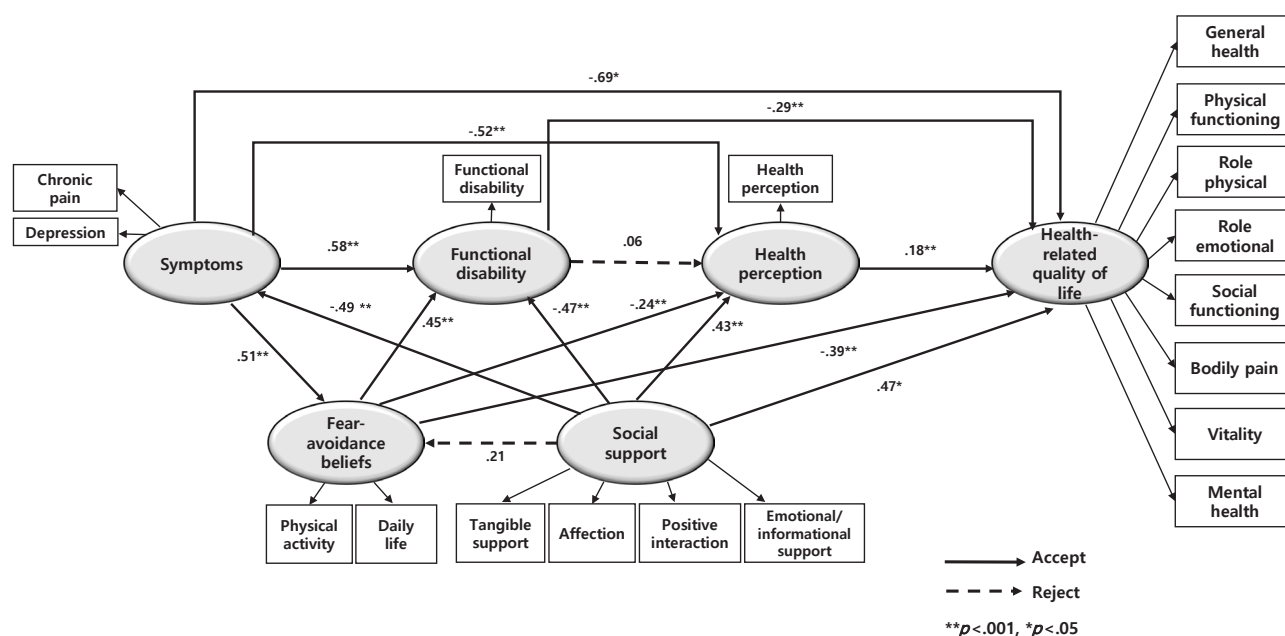
Figure 3. Path diagram of the hypothetical model.

DISCUSSION

Among the factors affecting health-related quality of life, the indirect (β=.37, *p*<.001) and total effects (β=.47, *p*<.001) of social support were statistically significant; however, the direct effect (β=.09, *p*=.075) was not. Symptoms had statistically significant direct (β=-.32, *p*<.001), indirect (β=-.37, *p*<.001), and total effects (β=-.69, *p*<.001) on health-related quality of life; similarly, fear-avoidance beliefs also had statistically significant direct (β=-.23, *p*<.001), indirect (β=-.17, *p*<.001), and total effects (β=-.39, *p*<.001). Functional disability had statistically significant direct (β=-.28, *p*<.001), indirect (β=-.01, *p*<.001), and total effects (β=-.29, *p*<.001) on health-related quality of life, while health perception had statistically significant direct (β=.18, *p*<.001) and total effects (β=.18, *p*<.001). The explanatory power of these variables on health-related quality of life, as the final endogenous variable, was 75.1%.

DISCUSSION

This study aimed to construct a structural model of health-related quality of life for elderly individuals with chronic pain. Based on disease-related characteristics and key concepts of health-related quality of life, the study proposed the causal relationships and directions between social support, symptoms, fear-avoidance beliefs, functional disability, health perceptions, and health-related quality of life. This study analyzed the structural model of health-related quality of life in older patients with chronic low back pain using PLS structural equation modeling. PLS structural equation modeling provides a robust statistical validation for the relationship between the research model and the population, especially when dealing with numerous variables and complex path explanations of diverse variables.

In the proposed model of health-related quality of life in older patients with chronic low back pain, social support as an environmental characteristic exerts an indirect influence on health-related quality of life. Furthermore, symptoms, fear-avoidance beliefs, functional disability, and health perceptions were found to have a direct impact on health-related quality of life in the proposed model, explaining 75.1% of the variance. The explanatory power of health-related quality of life in hospitalized patients with pulmonary tuberculosis was 52.4% [13]. For the study focusing on older patients with degenerative arthritis, which falls under chronic musculoskeletal pain, the explanatory power was 63.6% [6].

The reason for the higher explanatory power of the model in this study compared to previous research is that most of the prior studies presented the main variables from the health-related quality of life model as they were. However, in this study, fear-avoidance beliefs a disease-related characteristic of chronic pain patients, were selected as a major variable. By adding

this significant variable that influences the quality of life in older patients with chronic low back pain, it is estimated that the explanatory power of this study's model was higher. According to the findings of this study, Wilson and Cleary's model of health-related quality of life, social support indirectly influences health-related quality of life, while symptoms, fear-avoidance beliefs, functional disability, and health perceptions directly impact health-related quality of life. These results align with the theoretical pathways of the key concepts in Wilson and Cleary's model. Thus, this study has been validated as an appropriate model with sufficient variables to predict health-related quality of life in older patients with chronic low back pain.

In this study, the health-related quality of life of older patients with chronic low back pain was found to be 41.37 out of 100, which is similar to the results of a study by Lee [15], who used the same tool and reported a score of 42.84. In contrast, a study by Im [34] on community-dwelling older individuals without chronic pain reported a higher level of quality of life, with a score of 63.13, which indicated that the presence of chronic pain has a significant impact on quality of life. Older individuals experiencing chronic pain have various problems compared to general older individuals, and are more vulnerable to physical and psychological issues related to pain that affect their quality of life [16].

Social support for older people with chronic back pain was found to have a positive (+) indirect effect on their health-related quality of life. In addition, social support had a negative (-) direct effect on symptoms and functional disability, and a positive (+) direct effect on health perception. Our study found that social support, an environmental characteristic, affects symptoms such as pain, physical function, and depression [6,35]. This is consistent with the results of previous studies [13,18] which reported that social support indirectly affects health-related quality of life. Additionally, social support has been demonstrated to have a direct negative (-) effect on functional disability, which is consistent with previous reports showing that social support indirectly affects functional status in older patients with degenerative joint disease [6]. Moreover, Halvorsrud et al. [7] reported that social support had an effect on symptoms and functional disability, and that the higher the health perception, the higher the quality of life. Therefore, social support for older adults with chronic low back pain is necessary at multiple environmental levels, including family, medical professionals, and the community, as it can help reduce

negative physical and psychological symptoms and ultimately contribute to improving their quality of life.

Symptoms were found to have a positive (+) direct effect on fear-avoidance beliefs and functional disability, and a negative (-) direct effect on health perception and health-related quality of life in older adults with chronic low back pain. In other words, as the degree of symptom experience increases, fear-avoidance beliefs and functional disabilities tend to increase, and individuals tend to perceive their health and quality of life negatively. These results are consistent with those of previous studies [15,16,36], which confirmed that the greater the experience of symptoms in older individuals with chronic low back pain, the lower their quality of life. Additionally, as this study measured the latent variables of symptoms such as physical pain and psychological symptoms such as depression, it is consistent with previous research [6,13,37], which confirmed that not only physical but also psychological symptoms such as depression are major factors affecting quality of life in older adults with chronic low back pain.

In the current study, symptoms were found to affect fear-avoidance beliefs, which are often higher in individuals with chronic low back pain than in those with other chronic conditions owing to their physical and psychological symptoms [9]. These results are consistent with the findings of Seo's study [17]. Specifically, symptoms associated with chronic low back pain were found to affect functional disability, which is similar to previous studies reporting that pain intensity and damage from chronic low back pain are related to functional disability [38]. In addition, the symptoms of this population were found to affect their health perception, which is supported by the results of Park et al. [39], who reported a negative correlation between pain intensity and health perception in patients with chronic low back pain. Therefore, older individuals with chronic low back pain, who experience pain as a primary disorder, may avoid physical and daily life activities due to fear-avoidance beliefs, leading to functional disability. Thus, active management of physical and psychological symptoms is important for improving the quality of life of these individuals.

The fear-avoidance beliefs of older adults with chronic low back pain were found to have a positive (+) direct effect on functional disability and a negative (-) direct effect on health perception and health-related quality of life in this study. Fear-avoidance belief refers to the inherent belief that daily life and physical activity exacerbate pain [10]. This negative psychological factor leads to a fear of further injury and ultimately

makes movement difficult, leading to persistent functional disability in patients with chronic low back pain, as reported in previous studies [10,40]. Notably, Trinderup et al. [41] showed that fear-avoidance beliefs affect disability levels and quality of life in patients with chronic low back pain. Similarly, Seo [17] showed that fear-avoidance beliefs are a major factor in functional disability and health-related quality of life in patients with chronic low back pain, and Won [38] found that higher fear-avoidance beliefs were associated with higher levels of pain and functional disability, which is similar to the results of this study.

Our study showed that functional disability in older adults with chronic low back pain was found to have a negative (-) direct effect on health-related quality of life. Functional disability in older adults with chronic low back pain was found to be correlated with quality of life, and the more severe the limitations in daily functional activities caused by chronic low back pain, the lower the quality of life [15,16]. Seo [17] reported that functional disability in patients with chronic low back pain is a major factor affecting health-related quality of life, which is similar to the results of this study. In addition, patients with rheumatoid arthritis who have better functional status have a higher quality of life [42], and postoperative physical function and activity restriction have been reported as the most important predictors of improved health-related quality of life in patients who have undergone total hip arthroplasty [18].

Health perception of older adults with chronic low back pain had a direct positive (+) effect on their health-related quality of life. Previous studies on health perception and quality of life have found that an individual's subjective perception of their health has a greater effect on their quality of life than an objective evaluation of their health status [43]. Moreover, individuals with higher subjective health levels tend to have a better quality of life [44], and health perception of older adults with chronic musculoskeletal pain has been shown to have an effect on their quality of life [45]. Furthermore, Choi and Park [46] reported a significant difference in quality of life based on the subjective perception of chronic pain among older individuals. Therefore, our results, together with those of previous studies, confirm that environmental characteristics such as social support and symptoms, fear-avoidance beliefs, functional disability, and health perception have direct or indirect effects on the health-related quality of life of older individuals with chronic low back pain.

CONCLUSION

In this study, statistically significant variables affecting the health-related quality of life in older patients with chronic low back pain included social support, symptoms, fear-avoidance beliefs, functional disability, and health perceptions. Among these, symptoms were presented as the variable with the greatest explanatory power. Specifically, these factors could serve as foundational data for developing comprehensive interventions aimed at mitigating fear-avoidance beliefs and functional disability caused by symptoms, while also enhancing social support and health perception levels. Such interventions, addressing both physical and psychological symptoms, could ultimately be employed to enhance the health-related quality of life of older patients with chronic low back pain. In addition, this study has a limitation in that it does not include older patients with chronic back pain who were hospitalized due to the severity of their pain or those who have impaired mobility in their own homes. It is suggested that future research should encompass the entire population of older patients with chronic back pain and explore other variables beyond the ones that were investigated in this study.

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Authors' contribution

Study conception and design acquisition - SL and EJL; Data collection - SL; Analysis and interpretation of the data - SL and EJL; Drafting and critical revision of the manuscript - SL and EJL

Conflict of interest

No existing or potential conflict of interest relevant to this article was reported.

Data availability

Please contact the corresponding author for data availability.

REFERENCES

1. Statistics Korea. Future population projections: 2020 to 2070 [Internet]. Statistics Korea; 2021 Dec 9 [cited 2023 May 3]. Available from: https://kostat.go.kr/board.es?mid=a10301020600&bid=207&act=view&list_no=415453

2. KOSIS. Prevalence (based on physician diagnosis) and current treatment rates by type of chronic disease for elderly by gender [Internet]. KOSIS; 2022 Aug 19 [cited 2023 May 3]. Available from: https://kosis.kr/statHtml/statHtml.do?orgId=117&tblId=DT_117071_018&conn_path=I2

3. Bernfort L, Gerdle B, Rahmqvist M, Husberg M, Levin LÅ. Severity of chronic pain in an elderly population in Sweden:impact on costs and quality of life. Pain. 2015;156(3): 521-7. https://doi.org/10.1097/01.j.pain.0000460336.31600.01

4. The WHOQOL Group. The World Health Organization Quality of Life assessment (WHOQOL): position paper from the World Health Organization. Social Science & Medicine. 1995;41(10):1403-9. https://doi.org/10.1016/0277-9536(95)00112-k

5. Husky MM, Ferdous Farin F, Compagnone P, Fermanian C, Kovess-Masfety V. Chronic back pain and its association with quality of life in a large French population survey. Health and quaLity of Life Outcomes. 2018;16(1):195. https://doi.org/10.1186/s12955-018-1018-4

6. Oh J, Yi M. Structural equation modeling on quality of life in older adults with osteoarthritis. Journal of Korean Academy of Nursing. 2014;44(1):75-85. https://doi.org/10.4040/jkan.2014.44.1.75

7. Halvorsrud L, Kirkevold M, Diseth A, Kalfoss M. Quality of life model: predictors of quality of life among sick older adults. Research and Theory for Nursing Practice. 2010; 24(4):241-59. https://doi.org/10.1891/1541-6577.24.4.241

8. Papakostidou I, Dailiana ZH, Papapolychroniou T, Liaropoulos L, Zintzaras E, Karachalios TS, et al. Factors affect-ing the quality of life after total knee arthroplasties: a prospective study. BMC Musculoskeletal Disorders. 2012;13:116. https:// doi.org/10.1186/1471-2474-13-116

9. Wideman TH, Asmundson GGJ, Smeets RJEM, Zautra AJ, Simmonds MJ, Sullivan MJL, et al. Rethinking the fear avoidance model: toward a multidimensional framework of pain-related disability. Pain. 2013;154(11):2262-5. https://doi.org/10.1016/j.pain.2013.06.005

10. Vlaeyen JWS, Linton SJ. Fear-avoidance and its consequences in chronic musculoskeletal pain: a state of the art. Pain. 2000;85(3):317-32. https://doi.org/10.1016/S0304-3959(99)00242-0

11. Guclu DG, Guclu O, Ozaner A, Senormanci O, Konkan R. The relationship between disability, quality of life and fear-avoidance beliefs in patients with chronic low back pain. Turkish Neurosurgery. 2012;22(6):724-31. https://doi.org/10.5137/1019-5149.JTN.6156-12.1

12. Wilson IB, Cleary PD. Linking clinical variables with health-related quality of life. A conceptual model of patient outcomes. JAMA. 1995;273(1):59-65. https://doi.org/10.1001/jama.1995.03520250075037

13. Jang KS, Jeon GS. Prediction model for health-related quality of life in hospitalized patients with pulmonary tuberculosis. Journal of Korean Academy of Nursing. 2017;47(1): 60-70. https://doi.org/10.4040/jkan.2017.47.1.60

14. Eilayyan O, Gogovor A, Mayo N, Ernst P, Ahmed S. Predictors of perceived asthma control among patients managed in primary care clinics. Quality of Life Research. 2015;24(1):55-65. https://doi.org/10.1007/s11136-014-0700-1

15. Lee SE. A study on the relationship among pain, disability and quality of life of the elderly with chronic back pain [master's thesis]. Chung-Ang University; 2011. 67 p.

16. Bae JH. A study on the relation among chronic back pain, depression and quality of life in the elderly [master's thesis]. Hanyang University; 2010. 62 p.

17. Seo MJ. Pain, fear-avoidance beliefs, disability and health-related quality of life in patients with chronic low back pain [master's thesis]. The Catholic University of Korea; 2016. 37 p.

18. Lee HO, Yoo JS. A structural equation model of health-related quality of life among older women following bilateral total knee replacement. Journal of Korean Academy of Nursing. 2020;50(4):554-70. https://doi.org/10.4040/jkan.19216

19. Chin WW. Commentary: issues and opinion on structural equation modeling. MIS Quarterly. 1998;22(1):7-16.

20. Lim MK. Relationships between social support and health among low income groups in urban area [master's thesis]. Seoul National University; 2002. 88 p.

21. Sherbourne CD, Stewart AL. The MOS social support survey. Social Science & Medicine. 1991;32(6):705-14. https://doi.org/10.1016/0277-9536(91)90150-b

22. Von Korff M, Ormel J, Keefe FJ, Dworkin SF. Grading the severity of chronic pain. Pain. 1992;50(2):133-49. https://doi.org/10.1016/0304-3959(92)90154-4

23. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine. 2000;25(24):3186-91. https://doi.org/10.1097/00007632-200012150-00014

24. Smith BH, Penny KI, Purves AM, Munro C, Wilson B, Grimshaw J, et al. The Chronic Pain Grade questionnaire: validation and reliability in postal research. Pain. 1997;71(2):141-7. https://doi.org/10.1016/s0304-3959(97)03347-2

25. Kee BS. A preliminary study for the standardization of Geriatric Depression Scale Short Form-Korea version. Journal of Korean Neuropsychiatric Association. 1996;35(2):298-307.

26. Sheikh JI, Yesavage JA. Geriatric Depression Scale (GDS): recent evidence and development of a shorter version. Clinical Gerontologist. 1986;5(1-2):165-73. https://doi.org/10.1300/J018v05n01_09

27. Waddell G, Newton M, Henderson I, Somerville D, Main CJ. A Fear-Avoidance Beliefs Questionnaire (FABQ) and the role of fear-avoidance beliefs in chronic low back pain and disability. Pain. 1993;52(2):157-68. https://doi.org/10.1016/0304-3959(93)90127-B

28. Fairbank JC, Couper J, Davies JB, O'Brien JP. The Oswestry low back pain disability questionnaire. Physiotherapy. 1980;66(8):271-3.

29. Jeon CH, Kim DJ, Kim DJ, Lee HM, Park HJ. Cross-cultural adaptation of the Korean version of the Oswestry Disability Index (ODI). Journal of Korean Society of Spine Surgery. 2005;12(2):146-52. https://doi.org/10.4184/jkss.2005.12.2.146

30. Ware JE. Health perception questionnaire instruments for measuring nursing practice and other care variables. DHEW Publication; 1979. p. 158-61.

31. Yoo JS, Kim CJ, Park JW. A study of the correlation between health perception, health behavior, and health status of adolescents. Proceedings from Yonsei University. 1985;21(5):169-87.

32. Lee KS, Chung YS. A study on health perception and health promoting behavior in the elderly. The Journal of Korean Community Nursing. 1998;9(1):72-88.

33. Ware JE, Kosinski M, Bjorner JB, Turner-Bowker DM, Gandek B, Maruish ME. User's manual for the SF-36v2™ Health Survey. 2nd ed. QualityMetric Incorporated; 2007.

34. Im J. Quality of life (SF-36) and its associated factors among some elderly residents in a community [master's thesis]. Chosun University; 2006. 31 p.

35. Lee JY, Moon YS. Effects of chronic pain and social support on depression and suicide in the elderly. Journal of Digital Convergence. 2015;13(10):445-58. https://doi.org/10.14400/JDC.2015.13.10.445

36. Oh KA, Park J, Jeon DJ, Han MA, Choi SW. Relationship between low back pain and health-related quality of life among some elderly. Journal of Agricultural Medicine and Community Health. 2012;37(3):156-66. https://doi.org/10.5393/JAMCH.2012.37.3.156

37. Unalan D, Soyuer F, Ceyhan O, Basturk M, Ozturk A. Is the quality of life different in patients with active and inactive tuberculosis? The Indian Journal of Tuberculosis. 2008;55(3):127-37.

38. Won JI. Comparison of the relationship between impairment, disability and psychological factors according to the difference of duration of low back pain. Physical Therapy Korea. 2011;18(3):76-84.

39. Park HS, Kang YS, Park KY. A study on health perception and health promoting behavior in chronic back pain patients. Journal of Korean Academy of Nursing. 2006;36(3):439-48. https://doi.org/10.4040/jkan.2006.36.3.439

40. Fritz JM, George SZ, Delitto A. The role of fear-avoidance beliefs in acute low back pain: relationships with current and future disability and work status. Pain. 2001;94(1):7-15. https://doi.org/10.1016/S0304-3959(01)00333-5

41. Trinderup JS, Fisker A, Juhl CB, Petersen T. Fear avoidance beliefs as a predictor for long-term sick leave, disability and pain in patients with chronic low back pain. BMC Musculoskeletal Disorders. 2018;19(1):431. https://doi.org/10.1186/s12891-018-2351-9

42. Lee HY. Structural equation modeling on quality of life in patients with rheumatoid arthritis [dissertation]. Kangwon National University; 2013. 88 p.

43. Padilla GV, Grant MM. Quality of life as a cancer nursing outcome variable. Advances in Nursing Science. 1985;8(1): 45-60. https://doi.org/10.1097/00012272-198510000-00007

44. Heo S, Moser DK, Riegel B, Hall LA, Christman N. Testing a published model of health-related quality of life in heart failure. Journal of Cardiac Failure. 2005;11(5):372-9. https://doi.org/10.1016/j.cardfail.2004.12.001

45. Jeong H, Lee Y. Factors affecting quality of life in the elderly with chronic musculoskeletal pain. Journal of Muscle and Joint Health. 2018;25(2):92-103. https://doi.org/10.5953/JMJH.2018.25.2.92

46. Choi IS, Park K. The effects of pain, sleep, and depression on quality of life in elderly people with chronic pain. Journal of Digital Convergence. 2017;15(8):289-99. https://doi.org/10.14400/JDC.2017.15.8.289

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Assessing the implementation of a nursing home-based physical and mental training: Utilizing the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework: A qualitative descriptive study

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Purpose: This study aimed to evaluate the implementation of a Spirit program, which consists of physical and mental training for older adults who can perform independent activities as nursing home residents. **Methods:** In July 2022, the researchers interviewed seven older adults who had attended the Spirit program and two caregivers at a nursing home in Surakarta, Indonesia. The researchers applied the Reach, Effectiveness, Adoption, Implementation, and Maintenance framework during interviews. We measured participant engagement with the Spirit program, effectiveness to assess perceived benefits, adoption to gauge nursing homes' willingness to adopt the Spirit program, implementation to evaluate consistent execution, and maintenance to assess future program sustainability. **Results:** Older adults who could carry out independent activities participated in the Spirit program. The Spirit program adds new activities that they can perform, which have various benefits, including increased happiness, stamina, and sleep quality. The participants expressed receiving instructions regarding the Spirit program from caregivers without any pressure to participate, with instructors guiding the exercises and regular schedule management. Older adults move well; however, some experience obstacles while performing balance exercises. None of the participants experienced injuries while participating in the program. A program's continuity can be supported by the availability of tools that are easily accessible to older adults. **Conclusion:** The program improved the quality of life of older adults who can move independently as nursing home residents.

Keywords: Program evaluation; Community health nursing; Nursing homes; Aged

INTRODUCTION

The prevalence of sedentary behavior among nursing home residents has been high [1], especially during the coronavirus disease 2019 (COVID-19) pandemic [2]. Sedentary behavior is a risk factor for cardiovascular disease [3]. Furthermore, sed-entary behavior can cause obesity, type 2 diabetes, muscle and bone problems, mental health issues, certain cancers, weaker bones, poor blood circulation, and trouble thinking. Many older adults do not know about physical exercise programs based on expert recommendations, so they do not achieve the expected results [4]. Some older adults believe physical exercise is

painful and tedious, even though it can be a fun habit [5]. Other factors contribute to a lack of physical exercise [6].

Experts recommend that older adults perform regular physical exercise weekly for 150~300 minutes, done 3~5 times. Exercise includes 150~300 minutes of moderate-intensity aerobics, 75~150 minutes of high-intensity aerobics, or an equivalent combination. Additionally, moderate-intensity muscle strengthening involves the main muscles for 2 or more days a week, a combination of functional balance and strength at moderate or vigorous intensity for a minimum of 3 days a week [7,8].

Many exercise programs have been designed to change sedentary behavior in older adults living in nursing homes; however, changes in behavior do not last long [9]. Physical exercise has several physical, mental, and social benefits. An example of a physical benefit is reducing the risk of cardiovascular disease and falling. Therefore, developing an exercise program suitable for nursing home residents is essential [10]. Various physical activity programs are necessary so that older adults do not get bored easily during exercise; increase motivation and compliance with exercise [11]; improve mood, self-confidence, and happiness; and reduce anxiety and depression to improve their quality of life [12].

Caregiver staff for nursing home residents must also increase motivation and pay attention to older adults' preferred physical activity desires [8]. In addition to physical activity, mental and spiritual activities must also be included. It aims to improve the quality of life in older adults. Holistic care emphasizes the importance of the dynamic interaction of biological, psychological, social, and spiritual components to obtain optimal results [13].

A new program was designed for older adults who could move independently in nursing homes. This program is called Spirit and refers to enthusiasm. The Spirit program comprises a blend of physical exercises and mindfulness practice, including chair exercises, stationary bike exercises, walking, muscle-strengthening exercises, flexibility exercises, balance training, breathing relaxation, and gratitude practice. It aims to improve physical fitness and reduce anxiety, blood pressure, and the risk of falling, thus improving the quality of life of older nursing home residents. The researchers were interested in creating a new program for nursing home residents by combining safe, easy, and beneficial physical activities, such as aerobic exercises, strength training, flexibility exercises, and balance exercises. The program was complemented by breathing relaxation and gratitude therapy.

The Spirit program was based on recommendations from a review of 29 articles that highlighted the importance of engaging in physical activities that could be performed at home during the COVID-19 pandemic [14]. These activities focused on aerobics, strength, flexibility, balance exercises, relaxation, and meditation practices, as they can improve both physical and mental health while reducing the risk of falls, especially in older adults. The program consisted of physical exercises that included gymnastics, stationary bicycles, and walking, combined with breathing relaxation and gratitude, performed for 60 minutes three times a week, accompanied by an instructor. Researchers trained caregiver staff at a nursing home to become program instructors and supervisors in three sessions of 2 hours each until caregivers were deemed capable of becoming instructors. The research team member and caregiver taught or instructed the nursing home resident to follow the Spirit program. This program starts according to the abilities of older adults and can be gradually added.

In Indonesia, research on easy, inexpensive, and low-risk physical activities for older individuals is limited. Current research topics in the older adult population mostly focus on non-pharmacological therapies for disease prevention and mild disorders (minor health problems or medical conditions that are not overly severe but still have a slight impact on an individual's well-being or functioning) [15]. Meta-analysis results have shown that regular physical exercise in older adults is beneficial for reducing depression, improving the quality of life, and enhancing self-esteem [16]. As a non-pharmacological therapy, slow breathing techniques can lower blood pressure in older adults [17]. Therefore, it is expected to provide an easily implementable physical activity program for older adults as a follow-up to these findings.

The Spirit program was conducted in a nursing home. This study aimed to evaluate the pilot implementation of the Spirit program to determine whether it could be applied to a broader population.

METHODS

The Spirit program aimed to improve the physical and mental health of older adults residing in nursing homes during the social restrictions of the pandemic. The Spirit program was developed based on a literature review until May 14, 2020, and focused on maintaining physical fitness and mental health during the COVID-19 pandemic. From 29 high-quality publications in reputable databases, such as Embase, PubMed, SCOPUS, SPORTDiscus, and Web of Science, reduced physical activity during the pandemic was found to cause declines in various aspects such as oxygen consumption, cell oxygen uptake, stroke volume, circulation, and muscle metabolism. These conditions lead to physical and mental impairments. Recommendations for older adults include aerobic exercises, strength training, flexibility exercises, meditation, and balance training. Institutions are advised to create home-based physical activity programs, especially during government-imposed restrictions [14]. Sports and psychology experts have reviewed and approved the program.

We formed a team comprising two experts: one specializing in sports and the other in psychology. The sports specialist validates the physical activity movements for older adults that we propose by reviewing video recordings we have created. The sports expert team then meticulously evaluates these movements and provides feedback for improvement. To improve this, we got help from a psychology specialist to suggest mental and spiritual activities to go along with exercises. Afterwards, we concluded that exercises could be combined with relaxation and expressing gratitude. The inquiries we directed to both expert teams were as follows: 1) What do you think about stationary cycling, walking exercises, senior gymnastics, muscle-strengthening exercises, flexibility routines, relaxation, and expressing gratitude for elderly individuals?; 2) How do you perceive the exercise timing (3 times a week, 50~60 minutes)?; 3) According to your perspective, what elements influence the engagement of older adults in this initiative?; and 4) What advice or suggestions would you offer for enhancing this program?

The trial of the Spirit program was conducted on July 2022 for 4 weeks at a nursing home. Data were collected 1 week after the program trial was completed by interviewing seven older adults and two caregivers who had participated in the Spirit program trial. All sources provided informed consent to participate in the study. To participate in the Spirit program, individuals need to meet the following criteria: Being aged ≥60 years, possessing good communication skills, being willing to undergo the intervention, having resided in a nursing home in Surakarta for at least 3 months, having a Katz Index of Activities of Daily Living score indicating independence in essential daily activities [18], and obtaining permission from the nursing home management.

The researcher used a structured interview guide within The Reach, Effectiveness, Adoption, Implementation, Maintenance (RE-AIM) framework (Table 1). The RE-AIM was developed by Glasgow in 1999 [19]. This evaluation framework has five dimensions: reach, effectiveness, adoption, implementation, and maintenance. This study assessed the effects of public health interventions [19]. Interviews were conducted by a principal investigator with prior experience. The list of interview questions is presented in Table 1. The interviews were audio recorded and transcribed verbatim. NVivo12 software was used for data processing, coding, and analysis [20]. The research ethics committee examined and approved the study protocol and gave ethical clearance (institutional review board approval No. 88/UN27.06.6.1/KEP/EC/2021). The participants

Table 1. Interview Guide With RE-AIM Framework

Domain	Definition	Question example
Reach	–How is the participation of older adults in participating in the program and is expected to get.	–How many older adults join the program?
Effectiveness	–The benefits of the program on the activities and quality of life of older adults in nursing homes.	–What is the impact felt by older adults?
Adoption	–Description of how the program is promoted and endeavored to be accepted and followed by all respondents or participants.	–Were there any activities that were easy or difficult to continue?
Implementation	–How do the nursing house staff implement the program?	–What factors influence the participation of older adults in this program?
Maintenance	–Willingness of participants to continue to carry out the program	–Are they willing to continue this program?

RE-AIM=Reach, Effectiveness, Adoption, Implementation, Maintenance.

provided verbal consent to participate and withdraw from the study at any time. To ensure data credibility, researchers employed triangulation. This was achieved by involving multiple researchers in the analytical process to merge the data's interpretations objectively. Steps were taken, including team collaboration involving multiple researchers, discussions, and comparisons of the results, achieving consensus through in-depth discussions, and additional validation through external parties to objectively merge the interpretation of data [21].

We employed a descriptive qualitative methodology with a deductive approach during our qualitative analysis, integrating the RE-AIM framework. Our research aimed to evaluate the current and future status of the Spirit program, focusing on participant reach, program effectiveness, nursing home adoption, implementation consistency, and program maintenance. We asked the same interview questions to both older adults and caregivers using the RE-AIM framework and sought to understand the perspectives of both groups. Despite the limited participant size, the responses exhibited a common and steady pattern. This indicates that the collected data reached saturation, suggesting that the incorporation of additional participants is improbable to bring forth substantial or pertinent novel insights related to the research topic.

RESULTS

The older adults living in this nursing home have an average age of 66.0 years. They have been residents there for almost 2 years. Among the seven participants, five of them don't have any other health conditions. The particulars of these characteristics of older adult participants are indicated in Table 2.

The descriptive qualitative analysis results are presented as findings across various themes, utilizing the RE-AIM frame-

work are presented in Table 3. Reach: Older adults who are in good health and can walk can access the Spirit Program for nursing home residents. Effectiveness: The Spirit program brings older adults happiness, togetherness, entertainment, and good care and improves physical health, especially regarding better sleep quality. Adoption: Nursing home caregivers actively support the program by dedicating time as instructors, providing facilities, and motivating older adults to participate. Implementation: Older adults can actively engage in Spirit programs. It is recommended that balance exercises be simplified for easier participation by all older adults, with strict supervision from the instructor. Maintenance: The Spirit program is intended to be sustained by nursing home residents, with the primary goal of improving the quality of life for older adults. This is achieved through various means, including facility maintenance, communication, and implementation of feedback support programs. Furthermore, multiple benefits in dif-

Table 2. Characteristics of Participants

Characteristic	Older adult (n=7)	Caregiver (n=2)
Average age (year)	66.00±2.49	35.00±3.12
Length of stay in nursing home (month)	23.00±9.77	
Sex		
Male	3 (42.9)	2 (100)
Female	4 (57.1)	0 (0)
Educational background		
Elementary school	5 (71.4)	0 (0)
High school	2 (28.6)	0 (0)
Undergraduate	0 (0)	2 (100)
Comorbid		
With comorbid	2 (28.6)	0 (0)
Without comorbid	5 (71.4)	2 (100)

Values are presented as mean±standard deviation or n (%).

Table 3. Finding

Domain	Finding
Reach	Older adults who can carry out independent activities can actively participate in the Spirit program.
Effectiveness	The Spirit program implemented adds new activities that they can do has various benefits, increases happiness, increases stamina by improving joint health, and improves sleep quality for older adults as participants.
Adoption	Participants expressed that there were various directions from caregivers, no compulsion to join the program, instructors who guided the exercises, good schedule management, and various suggestions from other participants and caregivers.
Implementation	Participants revealed that the various activities during the Spirit program included gymnastics, cycling on site, walking within the nursing home complex, weight training, flexibility training, balance training, and breathing relaxation. Older adults can move well, but some experience obstacles when doing balance exercises. None of older adults suffered injuries while participating in the program.
Maintenance	The continuity of the program can be supported by the availability of tools that are easily accessible to older adults, so that older adults can carry out their physical activities and are not limited in time.

ferent directions motivated participants to continue with the Spirit program.

1. Reach

The program's scope was evaluated to determine how much it could reach a specific population or group. Additionally, reach can be interpreted as how many participants can follow or participate in the program. The scope or reach of the program was revealed by the orphanage staff, namely, the older adults in nursing homes who were still healthy and able to walk. Residents who have to rest completely or just bed rest cannot participate in the program. Participants indicated that the Spirit program was easy to implement for older adults, making it applicable to any nursing home setting and benefiting a larger population of independent nursing home residents.

"For individuals who are still in good health, meaning they can walk and do not require bed rest, they are still able to engage in their daily activities." (Older Adult 6)
"For the number of participants themselves, from start to finish, 7~8 older adults participate in this program." (Caregiver 1)

2. Effectiveness

Effectiveness is assessed based on how the program can provide benefits as directly expressed by participants.

The older adults revealed that the Spirit program is one of the things they enjoy because after participating, they can feel happiness, togetherness, and entertainment well-cared for. Moreover, after regularly participating in the program, older adults felt physically healthier, especially due to better sleep quality.

"Yes, if I could get an extra hour of sleep, it would benefit me. Second, I feel happy when we are always cared for together. Consequently, I do not feel bored like that. I sincerely thank you for your attention." (Older Adult 4)

3. Adoption

Adoption describes how the program is promoted, accepted, and followed by all the respondents or participants. In this study, nursing home caregivers actively supported the program by providing time to become instructors, providing facilities, and motivating older adults to participate.

"We always encourage the older adults to join us. We reach out to the caregivers in all departments to include as many grandparents as possible, especially those still capable of participating in the program. However, we should not push too hard. If they decide to come, they can come; if not, they have the choice not to attend." (Caregiver 1)

The nursing home caretakers also revealed that the Spirit program could become a well-organized program and facilitate the active movement of older adults.

"That is good enough, good enough... The grandmother is also happy. Most of them are still here. No more suggestions are needed; it is already good they have been trained. Um... their joints are active again, just like that." (Caregiver 2)

4. Implementation

Implementation was assessed based on program implementation, including how the program was implemented, the schedule of activities, participants' enthusiasm, reasons for participants wanting to join the program, and criticism and suggestions from older adult participants and nursing home staff regarding the sustainability of the Spirit Program.

"Yes, sir, because the instructor has not arrived yet. Some grandparents inquired about the delay and wondered why the sports instructor did not arrive. Their questions indicated their desire to engage in instructor-led activities. They eagerly await the instructor's arrival as they are strongly inclined to participate in sports activities." (Caregiver 1)

Seniors can join the movement in the Spirit program.

"For the movement, it is already possible to reach, sir, at least according to his grandmother. It is not too difficult." (Older Adult 5)

Balance exercises must be simplified in movement to make them easier for all older adults and require close supervision from instructors.

"I am sorry, sir, but I am unable to do it. I cannot walk in a straight line like that if I do not have something to hold onto." (Older Adult 1)

5. Maintenance

Maintenance refers to how program participants can still use the experiences they found while participating in the Spirit program to continue being carried out by nursing home residents. Participants can utilize their experiences to continue implementing the Spirit program in nursing homes. Various benefits motivated the participants to continue the Spirit program. In ensuring the continuity of this program, maintenance was conducted by involving participants' experiences, facility maintenance, and ongoing communication. Additionally, suggestions are provided to support the program's implementation to continue running in nursing homes.

"Later on, we might place this tool in the hall. For instance, there will be a designated area for it in the future." (Older Adult 5)

"Yes, we will... we will also have regular briefings for the present clients. Afterward, we will guide them to use it. Additionally, on Fridays, we have an exercise session. Later, we will invite the older adults to come to the hall and perform the exercises independently, especially those still capable of walking actively." (Caregiver 2)

"Whenever I can use the bicycle, I do not need to bring it to the office. It can stay here. If I am at the office, I hesitate to ask someone from the office first (laughs)." (Older Adult 2)

DISCUSSION

The qualitative in-depth interview analysis used the RE-AIM framework to present the findings. The Spirit Program is accessible to healthy older adults living in nursing homes. It brings happiness, togetherness, entertainment, and good care and improves physical health, including sleep quality. Nursing home caretakers actively supported the program by dedicating time as instructors and providing facilities to motivate participation. Under instructor supervision, older adults participated in a program with the recommended simplified balance exercises. The program aimed to sustain and enhance older adults' quality of life in nursing homes, motivated by multiple benefits.

The Spirit program was conducted in stages according to the abilities of the older adults. Programming considers the results of previous research on activities for older adults [8,14,22]. This study's results are consistent with those of previous studies that have shown a significant increase in the quality of life of older adults after participating in a program [22,23], especially during the COVID-19 pandemic [24]. The results are also consistent with meta-analysis conclusions regarding the relationship between physical activity and quality of life in older adults [16].

Existing programs must be evaluated periodically. Researchers have used the RE-AIM framework to assess the Spirit program because RE-AIM has been widely used by many researchers in public health and behavior change, especially qualitative research. This design can provide more in-depth information about the benefits obtained from a program and why and how the process occurs, which is difficult to explore using quantitative research [24].

Overall, the older adults performed well in the Spirit program. Indoor static bicycle exercise is the preferred exercise in fitness centers and is beneficial for increasing aerobic capacity and lowering blood pressure, lipid profile, and body composition [25]. The review results showed that regular physical activity positively affects all body systems; reduces stress and anxiety; and increases self-confidence and hormones of happiness, brain performance, and memory [26]. Participants stated that they benefited not only from healthier aspects of physical health, namely, being fitter, more flexible, and having better sleep quality, but also from feeling happy, being together, being entertained, and feeling cared for.

The participants revealed that there were older people with limited movement; therefore, the exercises were adjusted to their abilities, especially during balance exercises. Balance training can be performed using static or dynamic exercises. It can be prescribed based on older adults' ability to consult a health sports expert [27]. Balance training must still be conducted, considering that the prevalence of injuries related to falls in older adults in Indonesia is 12.8%; therefore, efforts are needed to prevent falls [28]. The meta-analysis showed that balance training, as a single program or combined with other activities, effectively prevented falls in older adults, especially those in nursing homes [29].

Activities should have the ability to make older adults feel comfortable, motivating them to do it regularly and avoiding excessive exercise that risks injury. Physical activity beyond the threshold of the training zone results in a decrease in mito-

chondrial function in cells [30], interferes with insulin metabolism and reduces the immune system [31].

Social support is essential in implementing programs for older adults [32]. The Spirit program received social support from nursing home managers, fellow seniors, and outsiders. The support provided was in the form of information, assistance with facilities and infrastructure, and motivation. This is one of the reasons older adults consistently participate in the Spirit program so that it can be appropriately implemented and is highly effective.

The maintenance and continuation of the Spirit program should be accompanied by various improvements and the availability of facilities for physical activity, motivation, and social support for nursing home residents, as well as scheduling adjusted to the abilities of older adults participating in the program. This maintenance and sustainability are based on a positive increase in the quality of life of older adults toward consistent, productive physical activity, especially when facing various events in their lives [33].

The Spirit program, combined with physical activity, relaxation techniques, gratitude therapy, and blood pressure monitoring, offers a comprehensive approach to address the unique challenges older adults face during this difficult time. By engaging in regular physical exercise, older adults can maintain their physical fitness, improve their mental well-being, and reduce their risk of falls [34]. The inclusion of relaxation techniques and gratitude therapy further contributed to managing stress and promoting a positive mindset. Additionally, the integration of blood pressure monitoring allows for the proactive management of cardiovascular health, which is crucial for older adults. By implementing the Spirit program, nursing home residents and older adult care facilities can provide a holistic and tailored approach to support older adults' well-being and overall quality of life during a pandemic. Future research should explore the long-term effects and sustainability of the Spirit program in improving the physical and mental health outcomes of older adults in similar settings.

This study has some limitations. Although the RE-AIM provides comprehensive guidelines for evaluating public health interventions, the findings may not directly apply to a broader population. The applicability of the results could be influenced by the specific conditions and characteristics of the evaluation study. Another limitation is the small number of participants in the qualitative research. This choice was because of the study's focus on a limited population of nursing home residents, which affected the amount of data that could be collected.

CONCLUSION

The Spirit program, which consists of gymnastics, stationary bicycles, walking, flexibility exercises, muscle strength, and balance, combined with breathing relaxation, provides the benefits of increasing physical fitness, health, happiness, and social interaction, making it worthy of being considered as a program to improve the quality of life of older adults in nursing homes.

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Authors' contribution

Conceptualization - EBC and AAS; Data curation - EBC; Formal analysis - EBC and S; Funding acquisition - AAS; Investigation - EBC; Methodology - AK and S; Project administration - EBC; Resources - AAS; Supervision - AAS, AK, and S; Validation - AAS, AK, and S; Writing – original draft - EBC; Writing – review & editing - EBC, AAS, AK, and S.

Conflict of interest

No existing or potential conflict of interest relevant to this article was reported.

Data availability

Please contact the corresponding author for data availability.

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REFERENCES

1. Huang J, Zou Y, Huang W, Zhou Y, Lin S, Chen J, et al. Factors associated with physical activity in elderly nursing home residents: a path analysis. BMC Geriatrics. 2020; 20(1):274. https://doi.org/10.1186/s12877-020-01676-8

2. Armitage R, Nellums LB. COVID-19 and the consequences of isolating the elderly. Lancet Public Health. 2020;5(5): e256. https://doi.org/10.1016/S2468-2667(20)30061-X

3. Tetra Dewi FS, Stenlund H, Marlinawati VU, Öhman A, Weinehall L. A community intervention for behaviour modification: an experience to control cardiovascular diseases in Yogyakarta, Indonesia. BMC Public Health. 2013; 13:1043. https://doi.org/10.1186/1471-2458-13-1043

4. Gluchowski A, Bilsborough H, Mcdermott J, Hawley-Hague H, Todd C. 'A lot of people just go for walks, and don't do anything else': older adults in the UK are not aware of the strength component embedded in the chief medical officers' physical activity guidelines: a qualitative study. International Journal of Environmental Research and Public Health. 2022;19(16):10002. https://doi.org/ 10.3390/ijerph191610002

5. Suwankhong D, Chinnasee C, Rittisorakrai C, Meksawi S, Rosenberg M. Perceptions of physical activity among older adults in rural communities Southern Thailand. Malaysian Journal of Medicine and Health Sciences. 2020;16(1):155-61.

6. Stathi A, Fox KR, Withall J, Bentley G, Thompson JL. Promoting physical activity in older adults: A guide for local decision makers. University of Bath; 2014.

7. WHO. WHO Guidelines on physical activity and sedentary behaviour. World Health Organization; 2020. p. 257-60.

8. de Souto Barreto P, Morley JE, Chodzko-Zajko W, H Pitkala K, Weening-Djiksterhuis E, Rodriguez-Mañas L, et al. Recommendations on physical activity and exercise for older adults living in long-term care facilities: a taskforce report. Journal of the American Medical Directors Association. 2016;17(5):381-92. https://doi.org/10.1016/j.jamda. 2016.01.021

9. Lachman ME, Lipsitz L, Lubben J, Castaneda-Sceppa C, Jette AM. When adults don't exercise: behavioral strategies to increase physical activity in sedentary middle-aged and older adults. Innovation in Aging. 2018;2(1):igy007. https:// doi.org/10.1093/geroni/igy007

10. Shin JH. Evaluation of an exercise program for older adults in a residential environment. Rehabilitation Nursing. 2018; 43(2):103-10. https://doi.org/10.1097/RNJ.00000000000 00073

11. Baz-Valle E, Schoenfeld BJ, Torres-Unda J, Santos-Concejero J, Balsalobre-Fernández C. The effects of exercise variation in muscle thickness, maximal strength and motivation in resistance trained men. PLoS One. 2019;14(12):e0226989. https://doi.org/10.1371/journal.pone.0226989

12. Muhsen TA, Muhsen MA. The impact of physical activity and sport on mental health. Journal of Physical Education. 2020;32(3):160-5. https://doi.org/10.37359/JOPE.V32(3) 2020.1032

13. Hatala AR. Towards a biopsychosocial-spiritual approach in health psychology: exploring theoretical orientations and future directions. Journal of Spirituality in Mental Health. 2013;15(4):256-76. https://doi.org/ 10.1080/ 19349637.2013.776448

14. Polero P, Rebollo-Seco C, Adsuar JC, Pérez-Gómez J, Rojo-Ramos J, Manzano-Redondo F, et al. Physical activity recommendations during COVID-19: narrative review. International Journal of Environmental Research and Public Health. 2020;18(1):65. https://doi.org/10.3390/ijerph 18010065

15. Herrod PJJ, Doleman B, Blackwell JEM, O'Boyle F, Williams JP, Lund JN, et al. Exercise and other nonpharmacological strategies to reduce blood pressure in older adults: a systematic review and meta-analysis. Journal of the American Society of Hypertension. 2018;12(4):248-67. https://doi. org/10.1016/j.jash.2018.01.008

16. Park M, Anaza E, Shin H, Pack SM, Chitiyo M. Relationship between physical activity and quality of life in older adults: a metaanalysis. Journal of Physical Education and Sport. 2020;20(6):3467-77. https://doi.org/10.7752/jpes. 2020.06468

17. Chaddha A, Modaff D, Hooper-Lane C, Feldstein DA. Device and non-device-guided slow breathing to reduce blood pressure: a systematic review and meta-analysis. Complementary Therapies in Medicine. 2019;45:179-84. https://doi.org/10.1016/j.ctim.2019.03.005

18. Shelkey M, Wallace M. Katz index of independence in activities of daily living. Journal of Gerontological Nursing. 1999;25(3):8-9. https://doi.org/10.3928/0098-9134-19990301-05

19. Glasgow RE, Harden SM, Gaglio B, Rabin B, Smith ML, Porter GC, et al. RE-AIM planning and evaluation framework: adapting to new science and practice with a 20-year review. Frontiers in Public Health. 2019;7:64. https://doi.org/10.3389/fpubh.2019.00064

20. Hoover RS, Koerber AL. Using NVivo to answer the challenges of qualitative research in professional communication: benefits and best practices tutorial. IEEE Transactions on Professional Communication. 2011;54(1):68-82. https://doi.org/10.1109/TPC.2009.2036896

21. Carter N, Bryant-Lukosius D, DiCenso A, Blythe J, Neville AJ. The use of triangulation in qualitative research. Oncology Nursing Forum. 2014;41(5):545-7. https://doi.org/10.1188/14.ONF.545-547

22. Riebe D, Ehrman JK, Liguori G, Magal M. ACSM's guidelines for exercise testing and pescription. 10th ed. Wolter Kluwer; 651 p.

23. Álvarez-Barbosa F, del Pozo-Cruz J, del Pozo-Cruz B, Alfonso-Rosa RM, Rogers ME, Zhang Y. Effects of supervised whole body vibration exercise on fall risk factors, functional dependence and health-related quality of life in nursing home residents aged 80+. Maturitas. 2014;79(4):456-63. https://doi.org/10.1016/j.maturitas.2014.09.010

24. Yi D, Yim J. Remote home-based exercise program to improve the mental state, balance, and physical function and prevent falls in adults aged 65 years and older during the COVID-19 Pandemic in Seoul, Korea. Medical Science Monitor. 2021;27:e935496. https://doi.org/10.12659/MSM.935496

25. Holtrop JS, Rabin BA, Glasgow RE. Qualitative approaches to use of the RE-AIM framework: rationale and methods. BMC Health Services Research. 2018;18(1):177. https://doi.org/10.1186/s12913-018-2938-8

26. Chavarrias M, Carlos-Vivas J, Collado-Mateo D, Pérez-Gómez J. Health benefits of indoor cycling: a systematic review. Medicina (Kaunas). 2019;55(8):452. https://doi.org/10.3390/medicina55080452

27. Elmagd MA. Benefits, need and importance of daily exercise. International Journal of Physical Education, Sports and Health. 2016;3(5):22-7.

28. Rodrigues IB, Ponzano M, Giangregorio LM. Practical tips for prescribing exercise for fall prevention. Osteoporosis International. 2019;30(10):1953-60. https://doi.org/10.1007/s00198-019-05141-0

29. Pengpid S, Peltzer K. Prevalence and risk factors associated with injurious falls among community-dwelling older adults in Indonesia. Current Gerontology and Geriatrics Research. 2018;2018:5964305. https://doi.org/10.1155/2018/5964305

30. Lee SH, Kim HS. Exercise interventions for preventing falls among older people in care facilities: a meta-analysis. Worldviews on Evidence-Based Nursing. 2017;14(1):74-80. https://doi.org/10.1111/wvn.12193

31. Flockhart M, Nilsson LC, Tais S, Ekblom B, Apró W, Larsen FJ. Excessive exercise training causes mitochondrial functional impairment and decreases glucose tolerance in healthy volunteers. Cell Metabolism. 2021;33(5):957-70.e6. https://doi.org/10.1016/j.cmet.2021.02.017

32. Guimarães TT, Terra R, Dutra PML. Chronic effects of exhausting exercise and overtraining on the immune response: Th1 and Th2 profile. Motricidade. 2017;13(3):69-78. https://doi.org/10.6063/motricidade.10049

33. Niedermeier M, Herzog S, Kopp-Wilfling P, Burtscher M, Kopp M. Is the effect of physical activity on quality of life in older adults mediated by social support? Gerontology. 2019;65(4):375-82. https://doi.org/10.1159/000496103

34. Yen HY, Lin LJ. Quality of life in older adults: benefits from the productive engagement in physical activity. Journal of Exercise Science and Fitness. 2018;16(2):49-54. https://doi.org/10.1016/j.jesf.2018.06.001

The impact of Long COVID, work stress related to infectious diseases, fatigue, and coping on burnout among care providers in nursing home: A cross-sectional correlation study

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Purpose: An increasing number of nursing home are being established because of the increased demand for treatment and care of older adults with chronic diseases related to population aging. This study aimed to examine the impact of Long COVID, infectious diseases-related to work stress, fatigue, and coping on burnout among care providers in nursing home during the persistent COVID-19 pandemic. **Methods:** A total of 168 care providers, including nurses, nursing assistants, and caregivers working in nursing home between July 22 and August 12, 2022 were polled by a questionnaire survey. The collected data were analyzed using an independent t-test, one-way analysis of variance, Scheffé test, Pearson correlation coefficient, and multiple regression analyses via SPSS 21.0. **Results:** The prevalence of Long COVID-19 among care providers in nursing home was 85.7%, with a mean burnout score of 2.59 out of 5. Work stress related to infectious diseases (β=.27, p=.002) and infection control fatigue (e.g., fatigue related to complexity of nursing duties and shortage in employees [β=.51, p=.019], conflicts caused by uncertain situations and a lack of support [β=.50, p=.012]) were the variables that significantly associated with burnout. **Conclusion:** It is crucial to actively explore strategies for reducing overall work stress, anxiety, and fatigue, particularly related to infection management to alleviate burnout among care providers in nursing home. Our findings provide fundamental data for the development of interventions and policies to prevent care providers' burnout, thus enabling the provision of high-quality care in nursing home.

Keywords: Long COVID; Burnout; Caregivers; Nursing home

INTRODUCTION

As of May 13, 2023, South Korea has reported a total of 31,390,699 confirmed coronavirus (COVID-19) cases and 34,597 deaths. Of these, 32,406 deaths occurred among individuals aged 60 years or older, accounting for 93.7% of all deaths. Older adults, particularly those residing in nursing home and facilities, have been vulnerable to outbreaks [1]. COVID-19 is characterized by its ability to spread quickly in enclosed and crowded environments, placing caregivers in nursing home at a high risk of infection because of their exposure to facility conditions, such as high occupancy rates, narrow bed-to-bed distances, frequent physical contact with clients, and shared meals [2]. Many patients diagnosed with COVID-19 have reported symptoms that persist after the acute phase of COVID-19. The Centers for Disease Control and Prevention (CDC) has termed these post-COVID conditions as "chronic COVID-19 syndrome" or "Long COVID", defined as

symptoms that persist for weeks following the initial COVID-19 infection. Common symptoms of Long COVID include fatigue, shortness of breath, chest pain, heart palpitations, headaches, sleep issues, dizziness, and changes in smell or taste [3,4].

Burnout refers to a state of psychological, emotional, and physical exhaustion that affects both individuals and organizations. More than half of hospital workers experience burnout, which raises serious concerns because it reduces the quality of patient care and productivity, and can even lead to relationship breakdowns and suicide [4]. Although data on the prevalence of Long COVID among care providers in nursing home are unavailable, a study in the United Kingdom found that approximately 36% of healthcare workers experienced Long COVID, with 57% experiencing burnout, indicating a correlation between the two [5]. In addition, the care and support responsibilities of care providers in nursing home frequently lead to high levels of job stress due to various work-related factors, emotional strain, and a lack of self-care, all of which have been shown to contribute to burnout [6]. Notably, during the COVID-19 pandemic, healthcare workers have been experiencing high levels of fatigue and burnout, with fatigue serving as a predictor of burnout [7]. Coping mechanisms play a crucial role in managing burnout among healthcare workers. Coping is a continuously evolving set of cognitive and behavioral changes aimed at managing an individual's perceived internal and external demands, and it serves as a strategy to mitigate burnout in healthcare workers [8].

Given that the quality of care and treatment provided by care providers in nursing home is closely related to their psychosocial health, it is important to pay attention to their mental health and well-being [9]. In nursing home, care is primarily provided by nurses, nursing assistants, and caregivers. Nursing assistants and caregivers provide direct care for older patients, while nurses are primarily responsible for educating and supervising them [10]. Providing care in nursing home involves inherent tension, arising from caring for physically disabled or dementia-affected older adults, accompanied by the burden of addressing various issues related to the care for older individuals [9-11]. As LTC hospitals are expanding owing to rapid population aging, burnout among care providers in this care setting is on the rise. While studies on burnout have been conducted at home and abroad, most have focused on healthcare workers such as nurses and doctors [5-7,10-15]. There is a lack of research on burnout among care providers in nursing home

in Korea, where COVID-19 outbreaks are frequent.

In particular, very few domestic studies have examined the relationship between Long COVID, infectious disease work stress, infection control fatigue, coping, and burnout among nursing home care providers. Therefore, this study aims to investigate the prevalence of Long COVID among care providers in nursing home and analyze the effects of Long COVID, work stress related to infectious, infection control fatigue, and coping mechanisms on burnout. The findings may provide a basis for developing effective strategies to reduce burnout among care providers nursing home and for long-term COVID-19 management in the future.

1. Objectives

This study aims to explore the impact of Long COVID, work stress related to infectious diseases, infection control fatigue, and coping on burnout among care providers in LTC hospitals. The specific objectives of this study are as follows:

To determine the prevalence of Long COVID among care providers nursing home and identify their levels of work stress related to infectious diseases, infection control fatigue, coping, and burnout.

To identify the factors that contribute to burnout among care providers in nursing home.

METHODS

Ethic statement: This study was approved by the Institutional Review Board (IRB) of Jeonbuk National University (IRB No. 2022-06-037-001). Informed consent was obtained from the participants.

1.Study Design

This cross-sectional study was conducted to determine the impact of Long COVID, work stress related to infectious, infection control fatigue, and coping on burnout levels among care providers in nursing home.

2. Theoretical Framework

This study utilized the stress process model as a theoretical framework that explains mental health issues such as burnout, and consists of stressors, mediators, contextual, background,

and outcome factors (Figure 1). Based on the stress process model and previous studies [4-6,8,10,12,13], this study included burnout as an outcome factor, with Long COVID, infectious disease-related work stress, infection control fatigue, and coping as a mediating factor. It also considers demographic (gender, age, education, and income), job-related (type of job, duration of work at the current hospital, and type of work), and health-related (underlying diseases) characteristics, as well as COVID-19-related (vaccination, time since COVID-19 diagnosis, symptoms, and substitute/extended work due to co-worker's COVID-19 diagnosis) characteristics as contextual factors [16] (Figure 2).

3. Study Participants

The target population comprised care providers working in nursing home in Korea, including nurses, nursing assistants, and caregivers, who provided care for older patients in four nursing home located in Jeonbuk Province. As the study focused on burnout among nursing home care providers who provided direct care to older adults, physical therapists and social workers were excluded. The inclusion criteria consisted: 1) those who had worked in a nursing home for more than 1 year, 2) those aged 18 years or older, 3) nurses, nursing assistants, and caregivers who were directly involved in patient care, 4) those who had been diagnosed with COVID-19 for more than 4 weeks, 5) those who voluntarily agreed to participate in the study, and 6) those who understood the study content and were able to complete the questionnaire. The exclusion criteria comprised those who were asymptomatic when diagnosed with COVID-19 and those with a psychiatric history.

Participants were selected using convenience sampling from four nursing home in Jeonbuk Province. Data were collected using a questionnaire, and only participants who expressed their willingness to participate were recruited.

To calculate the sample size, the G*Power version 3.1 program was utilized with an effect size of .15, a significance level of .05, power of .80, and 17 predictor variables, which required a minimum of 146 participants. Considering a dropout rate of approximately 20%, data were collected from 183 participants. The data from a total of 168 participants were used in the final analysis after excluding participants who were not nurses, nursing assistants, or caregivers (n=5), provided insufficient answers (n=4), had been diagnosed with COVID-19 for less than 4 weeks (n=4), and were asymptomatic at diagnosis (n=2).

4. Research Instruments

The research instruments used in this study were approved
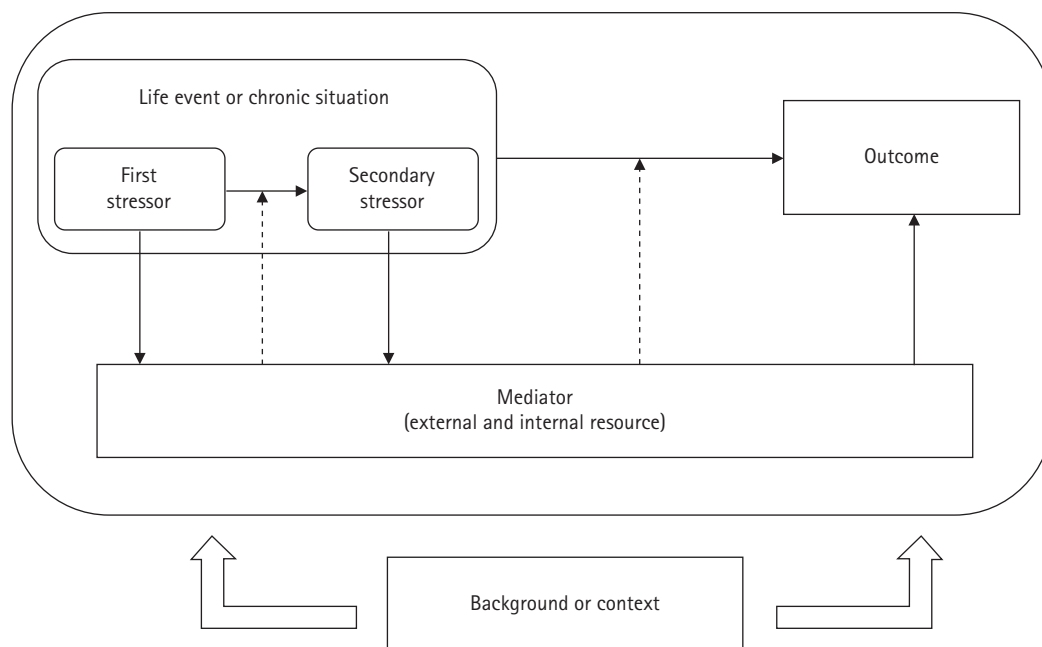
Figure 1. Stress process model.
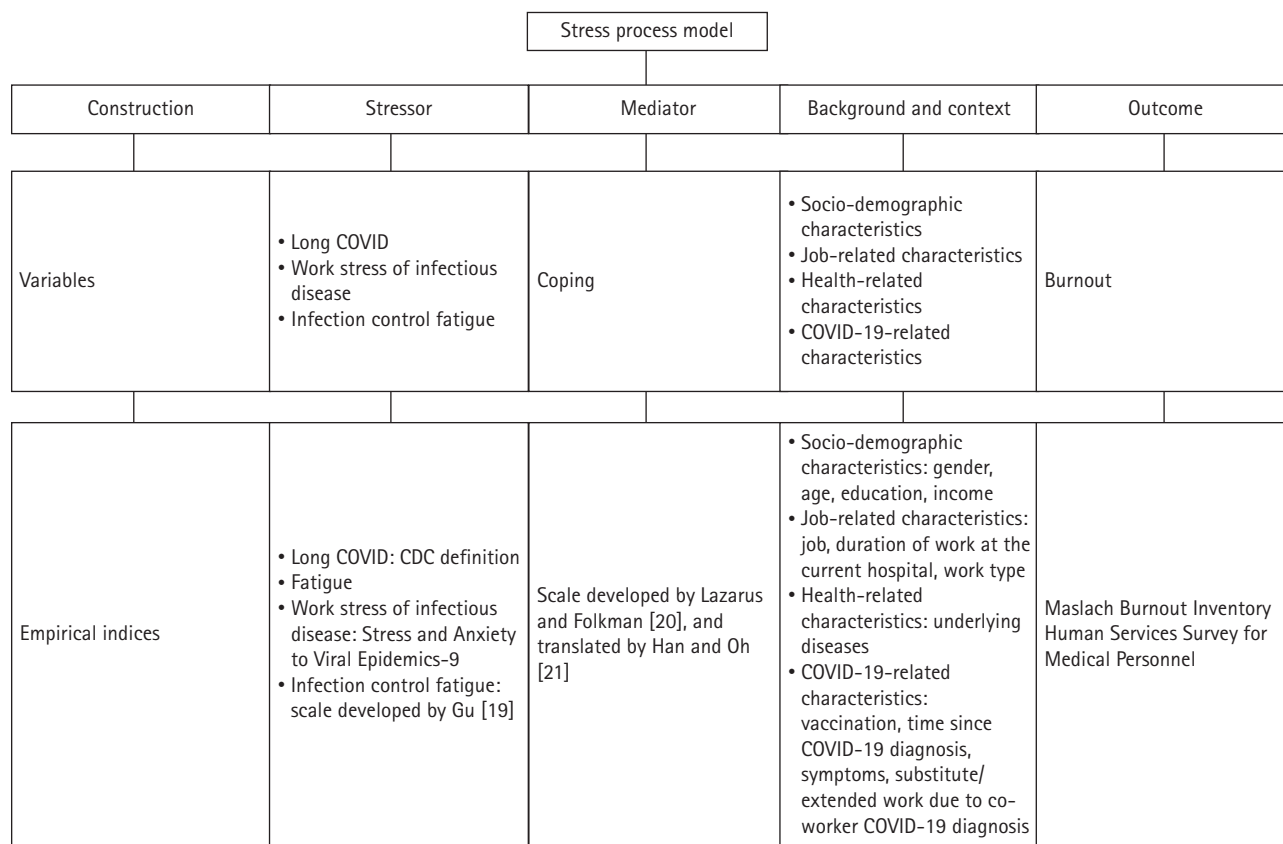
Figure 2. Theoretical framework based on the Stress process model. CDC=Centers for Disease Control and Prevention.

by their respective developers. A pilot test was conducted with 15 nurses, nursing assistants, and caregivers (five each) to assess their understanding of the questions and the time required to complete the final questionnaire. The results indicated that the time to complete the questionnaire ranged from 10 to 30 minutes, with an average time of 13.6 minutes, and all participants found the questions easy to understand.

1) Burnout

Burnout was measured using the Maslach Burnout Inventory Human Services Survey for Medical Personnel developed by Maslach and Jackson [17]. The instrument consists of three subscales: emotional exhaustion, depersonalization, and personal accomplishment, measured on a 22-item, 5-point Likert scale (1 = not at all, 5 = very much). For ease of interpretation, the personal accomplishment items were reverse-transformed and analyzed, with higher total scores indicating higher burn-

out levels. In the original instrument development study [17], the Cronbach's α was reported to be .84, while in this study, the Cronbach's α was .87.

2) Long COVID

In this study, Long COVID was defined in accordance with the CDC definition as the persistence of symptoms beyond 4 weeks of COVID-19 diagnosis [3]. Participants were asked to indicate whether they had experienced any of the 23 symptoms reported by the CDC. Each symptom experienced was coded as 1 if the respondent answered "Yes" and 0 if the respondent answered "No", and the scores for all 23 questions were summed. A total score of 0 indicated no experience of Long COVID, whereas a score of 1 or higher indicated the presence of Long COVID. A higher total score indicated a greater number of Long COVID symptoms reported by the participant.

3) Work stress related to infectious diseases

To measure work stress related to infectious diseases, this study employed the 3-item Stress and Anxiety to Viral Epidemics-9 scale developed by the Seoul Asan Medical Center [18], specifically corresponding to the 'work stress' subscale. The scale was measured using a 5-point Likert scale (1 = not at all, 5 = very much), with higher scores indicating higher levels of work stress related to viral epidemics. At the time of development, the Cronbach's α was reported to be .79, and in this study, Cronbach's α was .67.

4) Infection control fatigue

Infection control fatigue was measured using the infection control fatigue scale developed by Gu [19]. The scale consists of 39 items organized into five subdomains: exhaustion related to complexity of nursing duty and shortage in employees, deterioration of patients' conditions and lack of knowledge, conflicts caused by uncertain situation and lack of support, concerns on infections and burden caused by excessive amount of attention, and conflict and lack of support due to uncertainty, burden factors due to infection concerns and excessive attention, and new roles and demands. Each item was measured on a 5-point Likert scale (1 = not at all, 5 = very much), with higher scores indicating higher levels of COVID-19 infection control fatigue. In Gu's study [19], the Cronbach's α was .96, and Cronbach's α was .98 in the current study.

5) Coping

Coping was measured using an instrument developed by Lazarus and Folkman [20] and translated by Han and Oh [21]. It comprises 33 items and six subscales, including problem focus, wishful thinking, apathy, seeking social support, positive perspective, and relaxation. Each item was measured on a 4-point Likert scale (1 = not at all, 4 = very much), with higher scores indicating greater use of various coping methods. In Han and Oh's [21] study, Cronbach's α was .79, and in this study, Cronbach's α was .86.

6) General characteristics

The general characteristics of the participants included demographic, job-related, health-related, and COVID-19-related characteristics. Demographic characteristics included information on gender, age, education, and income. Job-related characteristics included type of job, duration of work at the current hospital, and work type. Health-related characteristics included information on whether the participants had any medical conditions. COVID-19-related characteristics included information on COVID-19 vaccination status, time since COVID-19 diagnosis, symptoms of COVID-19 infection, and whether they had to work alternative or extended hours due to co-worker's COVID-19 diagnosis.

5. Data Collection

Data collection was conducted from July 22 to August 12, 2022, among nurses, nursing assistants, and caregivers working in four nursing home in Jeonbuk Province. The study's purpose, content, and participation methods were explained to the nursing directors of each hospital. After obtaining their cooperation and approval, a recruitment notice was posted on the staff bulletin board. The nursing director of each hospital distributed the questionnaires and informed consent forms to staff members who expressed their willingness to participate. The completed questionnaires were sealed in a paper envelope and placed directly in a designated collection box in each nursing home.

The participants completed the structured questionnaire manually, which took approximately 20 minutes to complete. A small gift (a travel toothbrush set) was offered as compensation for their time.

6. Ethical Considerations

This study was approved by the IRB of Jeonbuk National University University (IRB No 2022-06-037-001).

7. Data Analysis

The collected data were analyzed using SPSS software (version 21.0; IBM Corp.). General characteristics, Long COVID experience, work stress related to infectious diseases, infection control fatigue, coping, and burnout were analyzed using frequencies, percentages, means, and standard deviations. Differences in burnout levels according to general characteristics were analyzed using an independent t-test and analysis of variance, followed by post-hoc tests using the Scheffé test. The correlations among Long COVID, work stress related to infectious diseases, infection control fatigue, coping, and burnout were analyzed using Pearson's correlation coefficient. To examine the factors contributing to burnout among the participants, we

performed a regression analysis. The analysis included education, job type, and the count of symptoms during COVID-19 diagnosis as control variables. Additionally, Long COVID, work-related stress linked to infectious diseases, infection control fatigue, and coping were considered as independent variables. The dependent variable was burnout. Education and job type, both measured nominally, were treated as dummy variables, with middle school graduates and caregivers as the respective baseline values.

RESULTS

1. Differences in Burnout Based on General Characteristics of Participants

The general characteristics of the participants are presented in Table 1. Among the study participants, 163 (97.0%) were women, with a mean age of 52.50 ± 9.44 years. As for education, 90 (53.6%) graduated from high school, and 89 participants (53.0%) had a monthly income between Korean Won (KRW) 1,510,000 and KRW 2,000,000. In terms of job-related characteristics, 77 (45.8%) were nursing assistants, 65 (38.7%) had been working at their current nursing home for more than 6 years, and 115 (71.4%) were three-shift care providers. Regarding health-related characteristics, 92 (56.4%) had no medical conditions, while 61 (37.4%) had one medical condition. Regarding COVID-19-related characteristics, 113 participants (67.3%) had received four COVID-19 vaccinations at the time of their recent diagnosis. At the time of COVID-19 diagnosis, 116 (69.5%) had received three vaccinations. One-hundred twenty-nine (73.8%) reported that the time since their COVID-19 diagnosis was 3~6 months. The average number of symptoms at the time of diagnosis was 3.70 ± 1.87, and 129 participants (77.2%) reported working substitute or overtime shifts due to a coworker's COVID-19 diagnosis (Table 1).

Participants' burnout levels varied significantly based on education (F = 4.17, p = .017), type of job (F = 4.48, p = .013), and the number of symptoms at the time of COVID-19 diagnosis (F = 4.53, p = .004). Nurses had higher levels of burnout than caregivers, as did those with a college degree or higher than those with a middle school degree. In addition, participants with five or more symptoms at the time of COVID-19 diagnosis exhibited higher levels of burnout than those with two or fewer symptoms (Table 1).

2. Participants' Experience of Long COVID, Work Stress Related to Infectious Diseases, Infection Control Fatigue, Coping, and Burnout

Of the total participants, 144 (85.7%) reported having Long COVID, with an average of 6.03 ± 4.29 symptoms. Cough was the most commonly experienced symptom, reported by 122 participants (72.6%). Other frequently reported symptoms included fatigue (n = 113; 67.7%), sore throat (n = 96; 57.1%), lethargy (n = 96; 57.1%), and headache (n = 90; 53.6%). The symptoms experienced less frequently included pneumonia (n = 1; 0.6%), other unspecified symptoms (n = 4; 2.4%), rashes (n = 5; 3.0%), and abdominal pain (n = 9; 5.4%) (Table 2). The mean score for work stress related to infectious diseases was 2.88 ± 0.80. The overall mean score for infection control fatigue was 3.06 ± 0.83, with subscales of complex procedures and staffing shortages at 3.37 ± 0.90 and burdened by infection concerns and excessive attention at 3.21 ± 0.96. Coping had a mean score of 2.62 ± 0.28, and burnout had a mean score of 2.59 ± 0.48. The skewness and kurtosis of the data were also examined. The skewness values ranged from -1.37 to 0.53, while the kurtosis values ranged from -0.54 to 6.19, with a skewness value of 3 and a kurtosis value of 10 fulfilling the assumption of normality of the data (Table 3).

Regarding the relationship between the number of Long COVID symptoms, work stress related to infectious diseases, infection control fatigue, coping, and burnout, the findings indicated that burnout was positively and significantly correlated with the number of Long COVID symptoms (r = .20, p = .010), work stress related to infectious diseases (r = .35, p < .001), and infection control fatigue (r = .39, p < .001). In contrast, burnout and coping (r = .09, p = .240) were not significantly correlated (Table 4).

3. Factors Influencing Burnout

Among the independent variables, coping was not found to be significantly related to burnout in the univariate analysis. However, as coping is a significant factor in the stress process model, which forms the theoretical basis of this study, it was included in the multivariate analysis.

Before running the regression, we checked whether the underlying assumptions were satisfied, and we found that all assumptions were met. The normality of the residuals was confirmed as the scatterplot closely resembled a 45° straight line.

Table 1. Differences in Burnout to General Characteristics (*N*=168)

Variable	Category	Mean±SD or *n* (%)	Burnout Mean±SD	t or F	*p*-value
Gender	Women	163 (97.0)	2.60±0.50	0.92	.354
	Men	5 (3.0)	2.40±0.35		
Age (year)		52.50±9.44		1.02	.382
	<40	16 (9.5)	2.65±0.49		
	40~49	31 (18.5)	2.68±0.57		
	50~59	88 (52.4)	2.61±0.46		
	≥60	33 (29.6)	2.48±0.49		
Education	Middle school[a]	8 (4.8)	2.44±0.71	4.17	.017
	High school	90 (53.6)	2.51±0.44	a<b	
	≥ College[b]	70 (41.7)	2.72±0.51		
Monthly incomes (million won)	151~200	89 (53.0)	2.54±0.49	1.70	.186
	201~250	49 (29.2)	2.64±0.50		
	≥251	30 (17.9)	2.71±0.43		
Job	Nurse[a]	41 (24.2)	2.75±0.55	4.48	.013
	Nursing assistant	77 (45.8)	2.60±0.41	a>b	
	Caregiver[b]	50 (29.8)	2.45±0.54		
Duration of work at the current hospital (year)	<2	45 (26.8)	2.59±0.50	0.13	.941
	2~4	26 (15.5)	2.61±0.44		
	4~6	32 (19.0)	2.56±0.57		
	≥6	65 (38.7)	2.59±0.49		
Work type (*n*=161)	2-shift	13 (8.1)	2.42±0.45	1.19	.313
	3-shift	115 (71.4)	2.58±0.47		
	Day fixed	29 (18.0)	2.58±0.62		
	Night fixed	4 (2.5)	2.89±0.33		
Underlying diseases (*n*=163)	0	92 (56.4)	2.64±0.45	1.29	.276
	1	61 (37.4)	2.52±0.47		
	≥2	10 (6.1)	2.56±0.80		
Current COVID-19 Vaccination	≤2	2 (1.2)	2.93±0.09	0.90	.407
	3	53 (31.5)	2.64±0.47		
	4	113 (67.3)	2.57±0.54		
Vaccinations before COVID-19 diagnosis (*n*=167)	≤2	6 (3.6)	2.43±0.54	2.15	.119
	3	116 (69.5)	2.65±0.50		
	4	45 (26.9)	2.48±0.47		
Time since COVID-19 diagnosis (month)	1~3	16 (9.5)	2.50±0.55	1.38	.253
	3~6	129 (76.8)	2.62±0.49		
	6~12	23 (13.7)	2.47±0.47		
Symptoms at the COVID-19 diagnosis		3.70±1.84			
	1~2[a]	49 (29.2)	242±0.50	4.53	.004
	3~4	68 (40.5)	2.60±0.46	a<b,c	
	5~6[b]	37 (22.0)	2.72±0.41		
	≥7[c]	14 (8.3)	2.86±0.54		
Substitute/extended work due to co-worker (*n*=167)	Yes	129 (77.2)	2.60±0.51	0.50	.615
	No	38 (22.8)	2.56±0.46		

The sum of the percentages does not equal 100% because of rounding. SD=Standard deviation.

Linearity and homoscedasticity assumptions of the model were satisfied, as the residuals were evenly distributed around zero. The autocorrelation of the dependent variable was checked using the Durbin-Watson index, which was 2.13, indicating that the residuals were independent without autocorrelation. In addition, the variation inflation factor ranged from 1.15 to 7.96, which did not exceed 10, indicating no multicollinearity among the independent variables. Furthermore, the regression

model fit was significant (Table 5).

The regression analysis indicated that the major factors influencing burnout were work stress related to infectious diseases (β = .27, p = .002), the sub-domain of infection control fatigue related to complexity of nursing duty and shortage in em-

ployees (β = .51, p = .019), and the sub-domain of conflicts caused by uncertain situation and lack of support (β = .50, p = . 012), with an explanatory power of 23.7% (Table 5).

DISCUSSION

By examining the prevalence of Long COVID among care providers in nursing home who were on the frontlines of patient care and support during the COVID-19 outbreak and the impact of work stress related to infectious diseases, infection control fatigue, and coping on burnout, this study attempted to provide a foundation for managing burnout during the prolonged COVID-19 period. The major factors influencing burnout were work stress related to infectious diseases, the sub-domain of infection control fatigue related to complexity of nursing duty and shortage in employees, and the sub-domain of conflicts caused by uncertain situation and lack of support.

The prevalence of Long COVID in this study was found to be 85.7%, while the average number of symptoms reported by participants was more than six. The most common symptoms were cough, fatigue, lethargy, sore throat, headache, and muscle pain. This finding is similar to the results of a study conducted by Yong [22], which examined symptoms after COVID-19 in countries such as the United Kingdom, Italy, and Australia and found that the prevalence of Long COVID ranged from 38.7% to 87.4% across different countries, with similar symptoms such as cough, fatigue, sore throat, lethargy, and shortness of breath. Therefore, it is necessary to closely monitor the symptoms of nursing home care providers with

Table 2. Long COVID Experiences (*N*=168)

Variable	Yes, *n* (%)	Mean±SD	Range
Long COVID experience	144 (85.7)		
Long COVID symptoms*		6.03±4.29	0~17
Cough	122 (72.6)		
Fatigue	113 (67.7)		
Sore throat	96 (57.1)		
Lethargy	96 (57.1)		
Headache	90 (53.6)		
Myalgia	84 (50.0)		
Joint pain	57 (33.9)		
Fever	55 (32.7)		
Smell or taste dysfunction	53 (31.5)		
Depression	37 (20.0)		
Dizziness	30 (17.9)		
Sleep problems	29 (17.3)		
Anxiety	28 (16.7)		
Palpitation	24 (14.3)		
Diarrhea	21 (12.5)		
Nausea	20 (11.9)		
Dyspnea	18 (10.7)		
Menstrual cycle change	14 (8.3)		
Abdominal pain	9 (5.4)		
Rashes	5 (3.0)		
Others: dry eye, brain fog, facial paralysis, memory problems	4 (2.4)		
Pneumonia	1 (0.6)		

*Multiple response; SD=Standard deviation.

Table 3. Descriptive Statistics of Major Variables (*N*=168)

Variable	Mean±SD	Min	Max	Skewness	Kurtosis
Long COVID symptoms	6.03±4.29	0.00	17.00	0.53	-0.39
Work stress related to infectious diseases	2.88±0.80	1.00	4.67	-0.51	-0.01
Infection control fatigue (ICF)	3.06±0.83	1.00	4.90	-0.23	-0.10
ICF 1	3.37±0.90	1.00	5.00	-0.34	-0.18
ICF 2	2.99±0.81	1.00	5.00	-0.18	-0.17
ICF 3	3.04±0.86	1.00	5.00	-0.16	-0.01
ICF 4	3.21±0.96	1.00	5.00	-0.02	-0.54
ICF 5	3.07±0.92	1.00	5.00	-0.16	-0.19
Coping	2.62±0.28	1.00	3.39	-1.37	6.19
Burnout	2.59±0.48	1.14	4.14	-0.33	0.30

ICF 1=Exhaustion related to complexity of nursing duty and shortage in employees; ICF 2=Deterioration of patients' conditions and lack of knowledge; ICF 3=Conflicts caused by uncertain situation and lack of support; ICF 4=Concerns on infections and burden caused by excessive amount of attention; ICF 5=New roles and demands; Max=Maximum; Min=Minimum; SD=Standard deviation.

Table 4. Correlation of Major Variables (N=168)

Variable	Long COVID symptom	Work stress related to infectious disease	Infection control fatigue	Coping	Burnout
			r (p)		
Long COVID symptoms	1				
Work stress related to infectious diseases	.20 (.011)	1			
Infection control fatigue	.47 (<.001)	.30 (<.001)	1		
Coping	.05 (.564)	.25 (.001)	.18 (.019)	1	
Burnout	.20 (.010)	.35 (<.001)	.39 (<.001)	.09 (.240)	1

Table 5. Factors Influencing Burnout (N=168)

Variable	β	SE	t	p-value
(Constant)		.41	3.97	<.001
Education (ref. middle school)				
High school	.01	.15	0.08	.938
≥ College	.001	.11	0.01	.996
Job (ref. caregiver)				
Nurse	-.02	.27	-0.08	.935
Nursing assistant	.09	.29	0.30	.768
Symptoms at the COVID-19 diagnosis	.18	.05	1.67	.097
Long COVID symptoms	-.11	.011	-1.07	.289
Work stress related to infectious diseases	.27	.05	3.17	.002
ICF 1	.51	.12	2.39	.019
ICF 2	.32	.11	1.66	.099
ICF 3	.50	.11	2.54	.012
ICF 4	.26	.10	1.25	.215
ICF 5	.14	.09	0.86	.391
Coping	.01	.14	0.06	.953
R^2=.31, Adjusted R^2=.24, F (p)=4.172 (<.001)				

ICF 1=Exhaustion related to complexity of nursing duty and shortage in employees; ICF 2=Deterioration of patients' conditions and lack of knowledge; ICF 3=Conflicts caused by uncertain situation and lack of support; ICF 4=Concerns on infections and burden caused by excessive amount of attention; ICF 5=New roles and demands; SE=Standard error.

Long COVID given its high prevalence, and special attention should be given to the potential occurrence of complications. To this end, it is crucial to offer assistance in managing post-effects, as well as educating nursing home care providers about tailoring their daily routines to individual circumstances, thereby empowering them to engage in effective self-care practices.

The average score of work stress related to infectious diseases among the participants in this study was 2.88 out of 5. The stress related to infectious diseases was examined in a study [10] focusing on acute-stage nurses responsible for newly admitted patients with infectious diseases. The recorded stress level was 3.45, surpassing the findings of our current study. While caregivers in acute hospitals attend to moderately ill patients for brief durations, those in nursing home are tasked with consistently managing stress due to caring for older patients with chronic diseases, including cases of COVID-19. Considering that nursing home care providers are constantly exposed to COVID-19 infections, they are burdened with intense workloads for long periods, along with anxiety about infection risks, resulting in increased physical and mental stress [23]. A study on the stress experienced by nurses working in COVID-19 inpatient wards [24] found that job stress and turnover intention increased in the context of dealing with new infectious diseases. Therefore, it is necessary to establish clear infectious disease work protocols for nursing home during new epidemics, provide comprehensive response training to help nursing home care providers adapt to infectious disease work, support the expansion of rest areas, and improve convenience measures to reduce work-related stress.

The participants reported an average infection control fatigue score of 3.06 out of 5, with higher fatigue levels noted in the subcategories of complexity of nursing duty and shortage in employees, conflicts caused by uncertain situation and lack of support. This finding is somewhat lower than that found in a study among general hospital nurses caring for patients during the COVID-19 pandemic [10], which reported a fatigue score of 3.45, but it still indicates a moderate-to-high level of fatigue. This difference in scores may be due to disparities in the characteristics of healthcare organizations and the general characteristics of the people being cared for. Among the subcategories, complexity of nursing duty and shortage in employees indicated the highest levels of fatigue, which is consistent with previous research on caring for patients with respiratory infections [15]. Healthcare workers on the frontline during the COVID-19 pandemic experienced more multifaceted fatigue than those caring for the general population owing to fear of

contagion, unfamiliar tasks, and frequently changing quarantine guidelines [24]. Furthermore, the deteriorating health of care recipients due to COVID-19 has increased the workload and intensity for healthcare and care facility workers, leading to prolonged tension-related fatigue [23,25].

Coping of nursing home care providers, as parameterized in this study through the stress process model, scored 2.62 out of 4, indicating their ability to cope with burnout within their work environment. A study on clinical nurses [25] during the COVID-19 pandemic using the same instrument as in this study, reported a similarly moderate coping score of 2.67. An emerging infectious disease pandemic, such as COVID-19, may contribute to a decrease in coping capacity, leading individuals to perceive the situation as beyond their control [21,25]. Therefore, national preparedness and robust response strategies are required to prevent and reduce burnout among healthcare workers who provide care to susceptible populations during an infectious disease outbreak such as COVID-19, in addition to improving individual coping skills.

The mean burnout score in this study was 2.59 out of 5 (39.8 on a 100-point scale). A study on nurses in Korean general hospitals during the initial COVID-19 pandemic [11] reported a burnout score of 30.0, while a study on nursing home caregivers in Spain during the COVID-19 pandemic [26] reported a burnout score of 31.9. The factors contributing to this higher mental and physical burnout in nursing home include the high risk of outbreaks in such vulnerable facilities, the high level of tension experienced by nursing home care providers, and the potential severe outcomes, such as patient deaths due to infectious diseases [12]. As burnout among nursing home care providers can reduce the quality of care provided to patients and increase workers' turnover intentions [13], it is important to strengthen disaster response capabilities for new infectious disease epidemics. This can be achieved by implementing appropriate job-oriented regulations and conducting regular simulation training for nursing home care providers before the outbreak of infectious diseases so that they can respond appropriately and mitigate the impact of burnout.

Based on a stress process model, this study examined the impact of Long COVID, work stress related to infectious diseases, infection control fatigue, and coping on burnout. The results indicated that burnout levels increased when participants experienced higher levels of work stress related to infectious diseases and infection control fatigue, compared to complexity of nursing duty and shortage in employees, conflicts caused by uncertain situation and lack of support. Several previous studies [11,18] have also shown that higher levels of burnout were associated with increased anxiety and stress related to infectious diseases, and that continued exposure to work anxiety, stress, and burnout eventually results in turnover and resignation among healthcare workers. Infection control fatigue related to healthcare workforce shortages during the COVID-19 pandemic has increased burnout levels among nurses in the United States [26] and Korean nurses caring for patients with respiratory infections [15]. Therefore, to reduce burnout among care providers in nursing home, proactive efforts to reduce infection control fatigue, which is exacerbated in healthcare settings where caregivers provide face-to-face care for vulnerable patients, remain a priority. One crucial measure is the establishment of clear protocols for care provision. In addition, government policies should include practical and reasonable support measures, such as the recruitment of additional personnel and the utilization of care assistants to address the labor shortage problem at the frontline.

One of the strengths of this study is the systematic consideration of various influencing factors. The stress process model, which is widely used in the literature and mental health research, encompasses stressors, mediators, contextual, background, and outcome factors. This study found that the "stressors" of infection-related work stress and fatigue, rather than demographic, occupational, or COVID-19-related factors suggested by the stress process model, were the most influential factors contributing to nursing home care providers' burnout. Therefore, stress-reduction strategies should be implemented to reduce burnout among care providers in nursing home. Further research is required to identify other sources of stress, in addition to infection-related work stress and fatigue, to expand the understanding of nursing home care providers' experiences. Although coping was found to be correlated with burnout as a mediator, the regression analysis showed that the two variables were not statistically significant. This suggests that the effectiveness of coping may not always be fixed but could depend on the situational context in which stress is experienced [20]. In addition, the emergence of COVID-19 variants and the prolonged pandemic may have led to changes in individuals' ability to cope with problematic situations. Therefore, it is important to conduct replication studies on the impact of coping on burnout as the COVID-19 pandemic comes to an end.

Although the present study reveals important findings, it has

several limitations. First, the study was conducted with care providers in local nursing home, which may limit the generalizability of the results to all nursing home care providers in Korea. In addition, there could be biases in the findings as participants recalled their experiences with COVID-19 symptoms through a self-administered questionnaire. In addition, the majority of care providers in this study were women, which may influence the results. Therefore, future research should consider the influence of gender.

However, this study is significant in that it identified the prevalence of Long COVID among nursing home care providers and the factors influencing burnout in the context of the COVID-19 pandemic, especially with the emergence of the omicron mutation and recurrent outbreaks. The study also serves as a basis for developing programs aimed at preventing and managing burnout among nursing home care providers in the event of new infectious diseases. A core strength of this study is that it examined the effects of infection control fatigue and work stress related to infectious diseases on burnout during the COVID-19 pandemic using measures specifically related to infection control.

CONCLUSION

This study aimed to determine the prevalence of Long COVID among LTC hospital care providers in the context of the ongoing COVID-19 pandemic, as well as the factors contributing to burnout, including work stress related to infectious diseases, infection control fatigue, and coping. The results showed that work stress related to infectious diseases and infection control fatigue caused by complicated procedures, conflicts due to staff shortages and uncertainty, and lack of support significantly contributed to burnout.

While patient-facing infection control work is critical, care providers in nursing home without negative-pressure rooms continue to work overtime, leading to high levels of stress and fatigue in their efforts to prevent the spread of COVID-19 infection. Therefore, to reduce burnout among care providers of vulnerable populations, it is essential to develop a comprehensive plan that thoroughly prepares care providers in nursing home for an infectious disease pandemic. In addition, the roles for infection prevention in medical institutions and facilities should be systematically defined. Moreover, it is necessary to provide sufficient education and training to reduce overall work stress and fatigue, including infection control measures.

Active support and multifaceted measures, such as ensuring rest breaks, guaranteed working hours, and hiring additional personnel to alleviate the workload burden on care providers, should also be implemented.

In conclusion, this study serves as a foundation for establishing effective interventions and policies to prevent burnout among care providers who provide care to vulnerable populations during emerging infectious disease outbreaks in the future. As the number of nursing home continues to increase owing to the demand for treatment and care due to rapid population aging and the increase in the number of older patients with chronic diseases, it is crucial to address the unique challenges faced by care providers, including burnout.

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Authors' contribution

Study conception - JP, YS, and YY; Data collection - YS; Analysis and interpretation of the data - JK, HL, YY, and JP; Drafting and critical revision of the manuscript - HL, JK, HYS, JP, and YY; Final approval - YY, HL, and JK

Conflict of interest

No existing or potential conflict of interest relevant to this article was reported.

Data availability

Please contact the corresponding author for data availability.

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REFERENCES

1. Korea Disease Control and Prevention Agency (KDCA). Domestic COVID-19 occurrence [Internet]. KDCA; 2023 [cited 2023 May 13]. Available from: https://ncov.kdca.go.kr/bdBoardList_Real.do? brdId＝1&brdGubun＝11&ncvContSeq＝&contSeq＝&board_id＝&gubun

2. Choi JH, Lee MJ, Lee SE, Park YJ, Kim DS, Park SK, et al. Epidemiological characteristics of COVID-19 outbreaks occurring in 6 long-term care facilities after July 2021, Republic of Korea. Public Health Weekly Report. 2021;14(37):2621-8.

3. Centers for Disease Control and Prevention (CDC). Long COVID or post-COVID conditions [Internet]. CDC; 2023 [cited 2023 July 4]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/long-term-effects/index.html

4. Tawfik DS, Scheid A, Profit J, Shanafelt T, Trockel M, Adair KC, et al. Evidence relating health care provider burnout and quality of care: a systematic review and meta-analysis. Annals of Internal Medicine. 2019;171(8):555-67. https://doi.org/10.7326/M19-1152

5. Selvaskandan H, Nimmo A, Savino M, Afuwape S, Brand S, Graham-Brown M, et al. Burnout and long COVID among the UK nephrology workforce: results from a national survey investigating the impact of COVID-19 on working lives. Clinical Kidney Journal. 2021;15(3):517-26. https://doi.org/10.1093/ckj/sfab264

6. Costello H, Walsh S, Cooper C, Livingston G. A systematic review and meta-analysis of the prevalence and associations of stress and burnout among staff in long-term care facilities for people with dementia. International Psychogeriatrics. 2019;31(8):1203-16. https://doi.org/10.1017/S1041610218001606

7. Raftopoulos V, Charalambous A, Talias M. The factors associated with the burnout syndrome and fatigue in Cypriot nurses: a census report. BMC Public Health. 2012;12:457. https://doi.org/10.1186/1471-2458-12-457

8. Shin H, Park YM, Ying JY, Kim B, Noh H, Lee SM. Relationships between coping strategies and burnout symptoms: a meta-analytic approach. Professional Psychology: Research and Practice. 2014;45(1):44-56. https://doi.org/10.1037/a0035220

9. Sörensen S, Duberstein P, Gill D, Pinquart M. Dementia care: mental health effects, intervention strategies, and clinical implications. The Lancet Neurology. 2006;5(11):961-73. https://doi.org/10.1016/S1474-4422(06)70599-3

10. Kang HJ, Lee MH, Lim HN, Lee KH. Influence of infection control fatigue and social support on nurses' burnout during the Coronavirus Disease 2019 pandemic. Journal of Korean Clinical Nursing Research. 2022;28(3):299-307. https://doi.org/10.22650/JKCNR.2022.28.3.299

11. Bae JY, Lee EK, Kim BJ, Lee EJ. The influencing factors of burnout in nurses in the COVID-19 pandemic disaster. Stress. 2021;29(2):80-6. https://doi.org/10.17547/kjsr.2021.29.2.80

12. Sung CW, Chen CH, Fan CY, Su FY, Chang JH, Hung CC, et al. Burnout in medical staffs during a Coronavirus Disease (COVID-19) pandemic. SSRN Electronic Journal. [Preprint]. [posted 2020 May 1]. Available from: https://doi.org/10.2139/ssrn.3594567

13. El Haj M, Allain P, Annweiler C, Boutoleau-Bretonnière C, Chapelet G, Gallouj K, et al. Burnout of healthcare workers in acute care geriatric facilities during the COVID-19 crisis: an online-based study. Journal of Alzheimer's Disease. 2020;78(2):847-52. https://doi.org/10.3233/JAD-201029

14. Kim KD, Yi YH. Post-traumatic stress disorder and burnout of healthcare providers who cared for patients with coronavirus disease-19 (COVID-19) in a tertiary general hospital. Journal of Korean Critical Care Nursing. 2022;15(3):101-14. https://doi.org/10.34250/jkccn.2022.15.3.101

15. Lee S, Kim Y. The influence of risk perception of respiratory infections, infection control fatigue and positive psychological capital on burnout of nurses caring respiratory infection patients. Journal of Korean Academy of Nursing Administration. 2022;28(2):154-63. https://doi.org/10.11111/jkana.2022.28.2.154

16. Pearlin LI, Lieberman MA, Menaghan EG, Mullan JT. The stress process. Journal of Health and Social Behavior. 1981;22(4):337-56. https://doi.org/10.2307/2136676

17. Maslach C, Jackson SE. The measurement of experienced burnout. Journal of Organizational Behavior. 1981;2(2):99-113. https://doi.org/10.1002/job.4030020205

18. Chung S, Kim HJ, Ahn MH, Yeo S, Lee J, Kim K, et al. Development of the Stress and Anxiety to Viral Epidemics-9 (SAVE-9) scale for assessing work-related stress and anxi-

ety in healthcare workers in response to viral epidemics. Journal of Korean Medical Science. 2021;36(47):e319. https://doi.org/10.3346/jkms.2021.36.e319

19. Gu HH. Fatigue symptoms and related factors among nurses participating pandemic influenza patient care: Focused on Middle East respiratory syndrome [master's thesis]. Sungshin Women's University; 2017. 66 p.

20. Lazarus RS, Folkman S. Stress, appraisal, and coping. Springer Publishing Company; 1984. 456 p.

21. Han JS, Oh KS. A study on the grief and coping pattern of mothers who have a chronically ill child. Korean Nurse. 1990;29(4):73-87.

22. Yong SJ. Long COVID or post-COVID-19 syndrome: putative pathophysiology, risk factors, and treatments. Infectious Diseases (London, England). 2021;53(10):737-54. https://doi.org/10.1080/23744235.2021.1924397

23. Okajima I, Chung S, Suh S. Validation of the Japanese version of Stress and Anxiety to Viral Epidemics-9 (SAVE-9) and relationship among stress, insomnia, anxiety, and de-pression in healthcare workers exposed to coronavirus disease 2019. Sleep Medicine. 2021;84:397-402. https://doi.org/10.1016/j.sleep.2021.06.035

24. Kim H, Hong J, Cho IK, Lee D, Cho E, Jun JY, et al. Psychometric properties of the Stress and Anxiety to Viral Epidemics-9 scale among frontline nursing professionals working in the COVID-19 inpatients ward. Frontiers in Psychiatry. 2022;13:934202. https://doi.org/10.3389/fpsyt.2022.934202

25. Hwang HJ. The effect of clinical nurses' self-leadership and stress-coping type on resilience. The Journal of Learner-Centered Curriculum and Instruction. 2021;21(18):679-91. https://doi.org/10.22251/jlcci.2021.21.18.679

26. Navarro Prados AB, Jiménez García-Tizón S, Meléndez JC. Sense of coherence and burnout in nursing home workers during the COVID-19 pandemic in Spain. Health & Social Care in the Community. 2022;30(1):244-52. https://doi.org/10.1111/hsc.13397

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지역사회 허약노인이 인지하는 건강한 노화: 혼종모형 개념분석

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Healthy aging of frail older adults in the community: A hybrid concept analysis

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Purpose: Although a stream of 'healthy aging' has been created, there is no consensus on defining healthy aging perceived by frail older adults. This study was conducted to investigate the concept of healthy aging perceived by frail older adults. **Methods:** The hybrid model consisted of three phases. In the theoretical phase, defining characteristics of healthy aging among frail older adults were identified through a literature review. A total of 1,166 articles were screened, and 32 relative articles were included. During the field phase, in-depth interviews were conducted with nine frail older adults who met the frailty criteria, and the data were analyzed through content analysis. In the final phase, based on the analysis of the literature review and qualitative interviews, a final definition of healthy aging in frail older adults was extracted. **Results:** The concept of healthy aging perceived by frail older adults was found in cognitive, behavioral, psychological, social and independent domains. For the frail older adults, healthy aging refers to the ability to maintain one's own health through self-management, accept aging and natural death with a positive outlook, and be independent without relying on others. **Conclusion:** In frail older adults, healthy aging consists of a number of multidimensional domains and 11 attributes, including maintaining health, accepting the process of aging, being positive, and being independent. Using this final definition, health promotion strategies could be developed to achieve the optimal goal. To provide effective interventions to frail older adults, further research is needed to develop a reliable and valid assessment scale.

Keywords: Frail elderly; Subjective health; Healthy aging; Concept-analysis

서론

1. 연구의 필요성

초고령화 사회를 앞두고 인구 구조의 급격한 변화로[1], 노화에 따

라 나타나는 기능의 상실이나 쇠약을 노인의 삶을 향상시키는 긍정적 관점에 초점을 두고 바라보기 시작하였다[2,3]. 허약노인은 미국의 노화연방위원회(Federal Council on Aging)에서 모든 노인이 동일한 요구를 가진 집단이 아님을 강조하면서 '신체적 장애, 정서적 손상이 있거나 부적절한 물리, 사회적 환경을 가진 노인 집단'을 구

분하기 위해 처음 사용되었다[4]. 허약노인은 건강과 장애의 중간 집단으로 신체 여러 기관의 기능이 점차 감소하고 생물학적 예비능력이 일정 수준 이하로 저하되어[5], 낙상, 시설 입소, 입원, 사망 등의 부정적인 건강 결과와 밀접하게 관련된다[6]. 그러나 허약은 가역적인 특성에 따라 예방할 수 있으므로[7], 노인의 허약 상태를 조기에 발견하고 관리하여 잠재적 장애를 예방하고 건강 행위를 실천할 수 있도록 이끄는 것이 필요하다.

하나의 자연스러운 과정으로 이해되었던 노화가 이전의 삶의 단계와 구분되기 시작하면서 여러 학자들은 성공적 노화를 다양하게 정의하고 있다. Baltes와 Baltes [8]은 성공적 노화의 지표로 수명, 생물학적 건강, 정신건강, 인지적 효능, 사회적 능력, 및 생산성, 개인적 통제, 생활만족 등을 제시하였으며, Rowe와 Kahn [9]은 질병과 장애의 위험이 적고 높은 수준의 인지적, 신체적 기능을 유지하며 삶에 적극적으로 참여하는 것으로 정의하였다. 여러 학자들이 내포하고 있는 성공적 노화를 살펴보면 건강하게 나이들어감, 즉 건강한 노화(aging well)가 가능한 한 쇠퇴를 지연하고 긍정적인 기능을 유지하는 것으로 볼 수 있다.

그러나 건강한 노화에 대해 노인의 실제 인식과 기존 노화 모델의 정의 간 상이함이 문제점으로 제기되었다[10]. Strawbridge 등[11]의 연구에서 Rowe와 Kahn이 제시하는 건강한 노화의 기준에 포함되지 못하는 노인들이 스스로 성공적으로 노화하고 있다고 평가하였으며, 허약노인들이 허약한 상태에도 불구하고 주관적 건강을 긍정적으로 평가하고 있었다[12]. 즉, 허약노인에게 있어 '건강한 노화'가 반드시 허약하지 않다는 것과 질병으로부터 자유로운 상태를 의미하지 않을 수 있다는 것이 제시되었다[12]. 또한 허약노인 스스로 인지하는 건강에 따라 환자 중심 중재가 다르게 결정될 수 있어 허약노인이 인지하는 건강한 노화를 탐구하는 것은 매우 중요하다[12]. 궁극적으로 허약노인의 관점을 고려할 때 건강한 노화(healthy aging)는 주관적 건강 인식에 따라 역동적인 개념일 수 있으므로[13] 허약노인이 인지하는 건강한 노화를 정의할 필요가 있으나 아직 관련 연구가 부족한 실정이다.

따라서 본 연구에서는 Schwartz-Barcott와 Kim [14]에 의해 개발된 혼종모형(hybrid model) 개념분석 방법을 이용하여 허약노인이 인지하는 건강한 노화에 대한 본질과 속성을 규명하고자 한다. 혼종모형 개념분석은 문헌 고찰을 통해 얻어진 이론적 분석과 실무에서 귀납적으로 추출된 경험적 내용을 결합하여 개념의 본질적 속성을 확인 후 실제 현상에서 사용할 수 있도록 하는 방법이다. 이에 본 연구에서는 혼종모형 개념분석방법을 적용하여 이론적 분석과 허약노인을 대상으로 한 심층면담을 시행하여 도출된 경험적 내용을 결합함으로써 허약노인이 인지하는 건강한 노화 개념의 영역과 속성을 명료화하고, 개념에 대한 정의를 규명하여 허약노인의 건강한 노화에 보다 적합한 간호중재 연구에 필요한 기초자료를 제공하는 데 있다.

2. 연구 목적

본 연구의 목적은 Schwartz-Barcott와 Kim [14]의 혼종모형을 사용하여 이론적 단계, 현장작업 단계, 최종 분석 단계를 거쳐 허약노인이 인지하는 건강한 노화의 영역과 속성을 규명하고 정의를 도출함으로써 개념적 기틀을 제공하여 분석한 개념을 실제 현상에서 사용할 수 있도록 허약노인이 인지하는 건강한 노화를 개념화하고자 한다.

연구방법

1. 연구설계

본 연구는 Schwartz-Barcott와 Kim [14]이 제시한 이론적 단계, 현장작업 단계, 최종 분석 단계의 3단계로 구성된 혼종모형 개념분석 방법을 이용하여 허약노인이 인지하는 건강한 노화에 대한 영역과 속성을 분석하여 정의를 규명하는 방법론적 연구이다. 혼종모형의 이론적 단계에서 체계적이고 광범위한 문헌 고찰 단계를 통해 개념의 속성과 정의를 파악하고, 현장작업 단계에서 개념의 실재를 확인한 후, 최종 분석 단계에서 이론적 단계와 현장작업 단계를 통해 도출된 결과를 비교, 분석하여 개념의 속성과 정의를 확인하였다.

2. 자료수집 및 분석

1) 이론적 단계

이론적 단계에서는 광범위한 문헌 고찰을 통하여 개념의 영역과 속성을 중점으로 사전적 의미와 문헌의 맥락을 분석하였다. 본 연구에서는 2021년 8월을 기준으로 '허약노인', '주관적 건강', '건강한 노화', '성공적 노화' 등의 주요 검색어를 이용하여 국문과 영문으로 게재된 허약노인의 건강한 노화 속성이 포함되어 있는 문헌을 연도의 제한 없이 검색하였다. 국내 문헌은 DBpia와 Koreanstudies Information Service System (KISS), Research Information Sharing Service (RISS), 국회전자도서관 검색엔진을 사용하여 검색하였으며 RISS를 통해 학위논문까지 포함하여 검색 결과 총 306개의 문헌이 검색되었다. 중복 문헌 44편을 제외한 후 제목 및 초록을 검토하여 허약노인이 인지하는 건강한 노화와 관련이 없는 문헌 186편을 제외하였으며, 남은 문헌의 전문을 검토하여 허약노인이 인지하는 건강한 노화의 속성을 파악할 수 있는 문헌으로 최종 7편을

선정하였다. 국외 문헌은 건강한 노화의 개념이 다양하게 사용되고 있었기 때문에 허약노인의 검색어 'frail elderly'를 포함하여 선행연구에서 제시된 'healthy aging', 'successful aging', 'active aging', 'productive aging', 'good aging'과 주관적 건강 인식의 MeSH 용어인 'diagnostic self-evaluation', 'subjective health', 'self-rated health', 'self-assessed health' 및 'self-perceived health'의 검색어를 조합하여 검색하였다. PubMed와 Embase, Cumulative Index to Nursing and Allied Health Literature (CINAHL)의 검색엔진 및 수기 검색으로 검색한 결과 총 1,166편의 문헌이 검색되었다. 중복 문헌 237편을 제외하고 남은 929편에 대해 문헌의 제목 및 초록을 검토하여 허약노인 대상이 아니거나 건강한 노화와 관련이 없는 문헌 786편을 제외하였다. 남은 문헌의 전문을 검토하여 허약노인이 아니거나 건강한 노화와 관련이 없는 문헌 118편을 제외하고 최종 국외 문헌 25편이 선정되었으며, 국내 문헌 7편을 포함하여 총 32편의 문헌이 선정되어 분석에 포함되었다 (Figure 1). 이론적 단계에서 문헌분석은 '허약노인의 건강한 노화의 핵심이 되는 본질이 무엇인지', '허약노인의 건강한 노화가 어떻게 정의되고 개념화되었는지', '개념의 본질이 주관적 건강의 속성을 반영하여 정의될 수 있는지'에 초점을 두고 문헌 고찰을 통하여 잠정적 정의를 내리고자 하였다.

2) 현장작업 단계

(1) 연구자 준비

본 연구의 연구자들은 현장작업 단계로 심층면담을 수행하기에 앞서 박사과정에서 질적연구방법론을 수강하였으며, 두 차례의 질적연구에 참여하여 연구 참여자 선정, 심층면담 진행, 녹음된 자료의 필사, 필사 원본으로부터 주제와 관련 있는 의미 있는 단어와 추상적인 언어로 주제들을 도출하는 훈련을 하였다.

(2) 현장 설정 및 교섭

기존의 혼종모형에서는 현장작업 단계에서 현장을 설정하여 교섭한 후 사례를 선택하고, 참여관찰을 통해 자료를 수집하는 것을 권고하였으나[14], 허약노인의 건강한 노화에 대한 개념의 생성 및 전이 현상을 발견하고 실제적인 현장의 모습을 파악하기 위해 개별 심층면담으로 진행하였다.

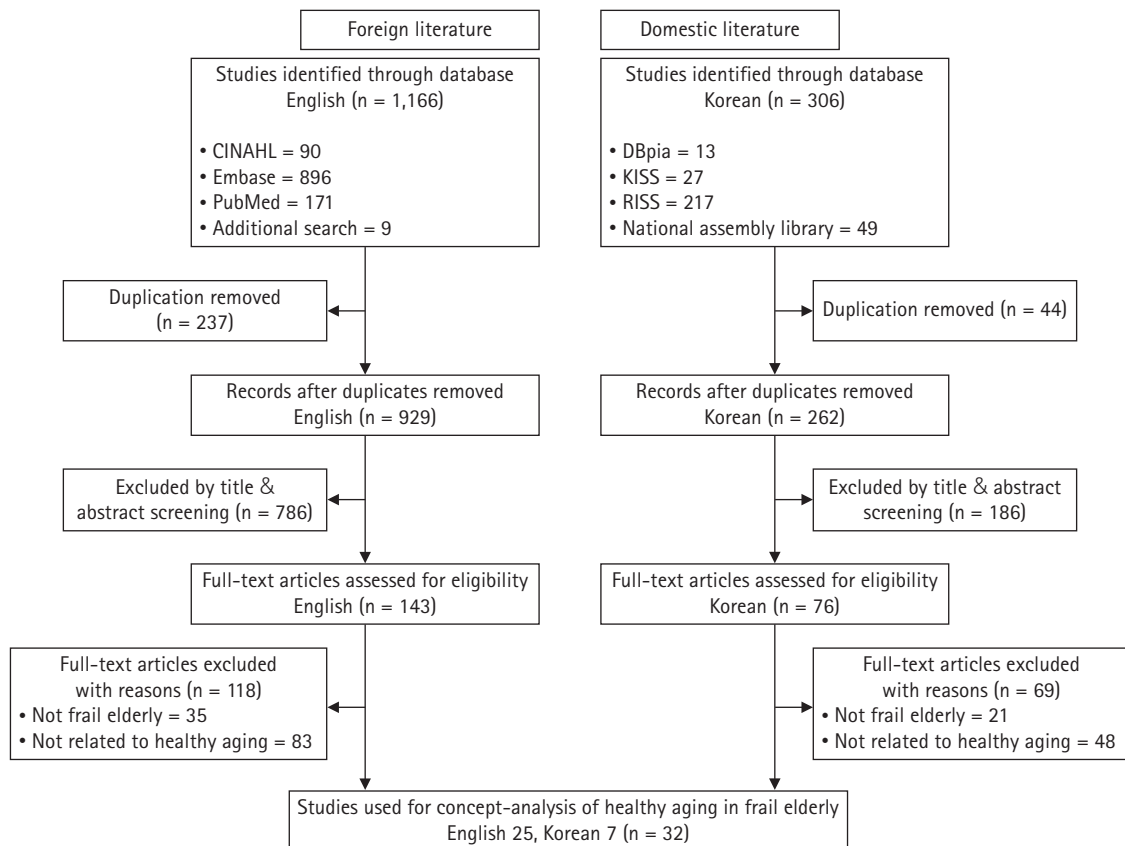#### (3) 연구 참여자 선정

현장작업 단계의 연구 참여자는 지역사회의 센터를 통해 허약노인

Figure 1. Procedure of literature identification and selection. CINAHL=Cumulative Index to Nursing and Allied Health Literature; KISS=Korean-studies Information Service System; RISS=Research Information Sharing Service.

을 의도적으로 표집하였다. 연구 참여자의 구체적인 선정 기준은 1) 지역사회에 거주하는 65세 이상의 노인, 2) 한국형 허약노인 선별도구[15]에서 5문항(피로, 저항, 보행, 질병, 체중감소) 중 3개 이상 충족한 경우 허약군(frail), 1~2개인 경우 전허약군(prefrail), 0개인 경우 robust군으로 분류되며, 본 도구를 이용한 허약노인 판정 결과에 따른 허약군과 전허약군, 3) 본 연구를 이해하고 참여에 동의한 자로 이론적 단계의 초기에 수집된 문헌 고찰에 근거하여 허약노인의 주관적 건강 인식에 따른 건강한 노화의 본질과 속성을 가장 잘 설명할 수 있는 대상자로 9명을 선정하였다. 선정된 9명의 연구 참여자의 연령은 60대 1명, 70대 4명, 80대 4명이었으며, 성별은 남자 2명, 여자 7명으로 이 중 4명은 허약군, 5명은 전허약군이었다(Table 1).

(4) 자료수집

2021년 9월 1일부터 10월 30일까지 대전광역시의 지역사회 센터에 등록된 65세 이상으로 허약 또는 전허약으로 판정된 노인 중에서 연구의 목적을 이해하고 연구 참여에 동의한 허약노인을 대상으로 심층면담을 진행하였다. 모든 심층면담은 해당 지역의 방역 수칙에 따르며, 조사원과 참여자 모두 마스크를 착용한 채 환기가 잘되는 조용한 곳을 확보하여 일대일로 진행하였다. 심층면담은 전화로 참여자가 원하는 시간으로 정하여 지역사회 센터 내 회의실, 교회 회의실 및 대상자의 집에서 1인당 1회 시행하고, 허약노인임을 감안하여 1회에 30분~1시간 정도 소요되도록 구성하였다. 면담 내용은 사전 허락을 받고 녹음하였으며, 추가로 현장노트를 활용하여 자료를 수집하였다. 허약노인이 인지하는 건강한 노화 속성을 확인할 수 있는 구조화된 핵심 질문을 이용하였으며, 주요 질문 내용은 '나이가 들어감

에 따라 건강에 대해 어떻게 느끼나요?', '자신이 잘 늙어가고 있다고 느꼈던 경험에는 어떤 것들이 있었나요?', '잘 늙어가기 위해서 중요한 건강의 요소는 무엇이라고 생각하나요?' 등이다.

(5) 자료 분석

현장작업 단계의 자료 분석은 이론적 단계에서 확인된 개념의 구성 요인 및 분석을 확장하고 통합하는 것으로 문헌 고찰을 통해 확인된 허약노인이 인지하는 건강한 노화 개념과 관련된 속성을 염두에 두고 진행하였다. 현장단계에서 심층면담을 통해 수집된 원자료는 질적 내용분석 방법으로 분석을 시행하였다[16]. 질적 내용분석 방법은 현장에서 수집된 자료로부터 지속적인 비교 및 분류하는 과정을 통해 개념을 도출하여 더 추상적인 수준으로 범주화하는 것으로[16], 질적 내용분석을 위해 면담 내용을 당일 필사하여 전사된 내용을 반복적으로 읽으며 의미 있는 진술들에 밑줄을 그어 의미 있는 단어를 찾아낸 후 공통된 의미들을 묶어 하위 범주를 도출하고 범주들의 속성과 차원을 도출하였다. 이론적 단계로부터 도출된 속성과 각 범주와 속성, 차원을 비교·분석하면서 진술의 의미를 가장 잘 보여줄 수 있는 용어를 선정하였다.

(6) 연구의 타당도 고려

Sandelowski [17]의 기준에 따라 연구 참여자가 이야기한 그대로 녹음하고 필사하여 자료의 신뢰성을 높였고, 필사한 자료를 반복하여 읽으며 다른 해석의 가능성을 의도적으로 시행하고 비교함으로써 분석의 신뢰성을 높였다. 본 연구의 분석 내용과 결과에 대한 타당성 확보를 위해 9인의 연구 참여자들에게 연구자가 분석한 결과를 보여주며 자신이 의도한 내용과 일치하는지 확인하였으며, 연구 참여자

Table 1. General Characteristics of Participants

Patient No.	Age (year)	Sex	Education (year)	Living status	Subjective economic status	Medication of chronic disease	Frailty by FRAIL scale
Participant 1	86	Female	Elementary (4)	Living together (son)	Poor	Hypertension, diabetes mellitus, cardiovascular disease	Frail
Participant 2	80	Female	None	None	Fair	Hypertension, cardiovascular disease	Frail
Participant 3	86	Male	Elementary (6)	Living together (spouse)	Fair	Pain killer, dermatology medication	Frail
Participant 4	80	Female	Elementary (3)	Living together (spouse)	Fair	Hypertension, diabetes mellitus, cerebrovascular disease, osteoarthritis	Frail
Participant 5	75	Female	Middle (8)	Living together (spouse, son)	Poor	Cardiovascular disease, osteoarthritis	Prefrail
Participant 6	68	Female	Elementary (6)	Living together (spouse)	Fair	Hypertension, pain killer	Prefrail
Participant 7	79	Male	Elementary (5)	Living together (spouse)	Poor	Pulmonology medication	Prefrail
Participant 8	70	Female	Elementary (6)	Living together (son)	Poor	Diabetes mellitus	Prefrail
Participant 9	77	Female	Elementary (6)	Living together (spouse)	Poor	Hypertension, calcium supplement, nephrology medication	Prefrail

FRAIL scale=Fatigue, resistance, ambulation, illnesses, and loss of weight.

모집 방법과 자료수집 절차를 자세히 기록하고 원자료를 남겨 신뢰성을 확보하고자 하였다. 도출된 주제들과 원자료 간의 명확성을 위해 연구 결과에 연구 참여자의 진술문을 삽입하였으며, 연구의 확증성 및 타당도를 높이기 위하여 질적연구 경험이 있는 간호학 교수 2명에게 고찰을 받았다.

(7) 윤리적 고려

본 연구의 윤리적 타당성을 확보하기 위해 충남대학교 생명윤리위원회(IRB)의 승인(IRB No. 202104-SB-060-01)을 받았다. 연구 참여자의 모집 및 심층면담 시작 전 참여자에게 사전에 연락하여 연구의 목적과 취지를 설명하고 자발적인 서면동의를 얻었다. 심층면담 내용의 녹음과 면담 도중 참여자가 원하면 면담을 중단할 수 있으며, 면담 내용은 연구의 목적 이외에는 사용되지 않는다는 것을 설명하고, 개인정보가 유출되지 않도록 보안을 유지하며 자료 분석 후 일정 기간이 지나면 파쇄할 것임을 설명하였다. 필사본의 작성과 연구 결과 진술 시 연구 참여자를 구분하기 위해 가명을 사용하였으며, 참여자 개인의 인적 사항이나 신원 파악을 할 수 있는 사항은 모두 기호화하여 기록하였다. 본 연구의 연구 참여자들에게는 연구 참여에 따른 소정의 사은품을 제공하였다. 또한 허약노인임을 고려하여 심층면담 도중 참여자가 두통, 어지러움, 피로함 등을 호소할 수 있으므로 참여자의 편의를 위하여 의자나 탁자를 제공할 수 있는 공간에서 면담을 진행하였으며, 참여자들의 안색을 지속적으로 살피면서 중간에 휴식 시간을 가져 피로를 완화할 수 있도록 도왔다.

3) 최종 분석 단계

혼종모형의 최종 분석 단계는 이론적 단계와 현장작업 단계의 결과를 비교·분석하여 연구 결과를 통합하는 단계이다. 이론적 단계의 문헌 고찰을 통해 도출된 허약노인이 인지하는 건강한 노화에 대한 본질적 속성과 현장작업 단계에서 확인된 속성을 비교하여 허약노인이 인지하는 건강한 노화 개념의 영역, 속성, 정의, 경험적 준거(empirical referent)를 확인하고 최종 정의를 내렸다.

연구결과

1. 이론적 단계에서 나타난 허약노인이 인지하는 건강한 노화에 대한 영역과 속성 확인

1) 허약노인이 인지하는 건강한 노화 사전적 의미

표준국어대사전[18]에서 '허약'은 '힘이나 기운이 없고 약함'이며, '노인'은 '나이가 들어 늙은 사람'을 뜻한다. '건강'은 '정신적으로나 육체적으로 아무 탈이 없고 튼튼함, 또는 그런 상태'이며, '노화'는 '질병이나 사고에 의한 것이 아니라 시간이 흐름에 따라 생체 구조와 기능이 쇠퇴하는 현상'으로 기술되어 있다. Oxford English Dictionary [19]에서 허약노인의 영문 표기에 따라 'frail'과 'elderly'로

나눠 파악한 결과 'frail'은 '연약한, 약한'이며, 'elderly'는 '노인'이다. 건강한 노화의 영문 표기에 따라 'healthy'와 'aging'으로 나눠 확인한 결과 'healthy'는 '건강을 소유하거나 향유하는 것', '건강에 도움이 되거나 건강을 촉진하는 것'으로 정의되며, 'aging'은 '사람, 동물 또는 사물이 나이가 들어감에 따라 나타나는 것'로 정의되어 있다. 이상의 사전적 의미를 종합해보면 허약노인의 건강한 노화는 '연약하고 약한 노인이 나이가 들어감에 따라 건강을 소유하거나 건강을 향유하는 것, 건강에 도움이 되도록 건강을 촉진하는 것'으로 정의할 수 있다.

2) 간호학 문헌에서 제시된 허약노인이 인지하는 건강한 노화 영역과 속성

간호학 문헌에서 허약노인이 인지하는 건강한 노화는 인지적 영역, 행동적 영역, 심리적 영역, 사회적, 영역 통합적 영역의 5개 영역에 따른 6개 속성이 도출되었다(Table 2). 분석 결과에 따라 인지적 영역에서 긍정적으로 자기를 인식하여 확장하는 자기효능감을 가지며[A1,A2] 스스로를 젊다고 생각하는[A3] '자신에 대한 긍정적인 믿음과 생각'이 속성으로 확인되었다. 행동적 영역에서 스스로 건강을 이해하고 관리하여 건강증진 행위를 하는[A4,A5,A6] '자기관리를 해낼 수 있는 상태'와 일상생활의 기능을 유지함으로써[A2,A7] 노년기의 웰빙이 가능하게 하는 '일상생활능력과 기능적 능력 수준의 유지'가 속성으로 확인되었다. 심리적 영역에서 '우울하지 않은 상태' 속성은 우울하지 않은 상태에서 판단하지 않고 의식적으로 행동하는 것이 포함되었다[A9]. 사회적 영역은 능동적인 사회참여 유지[A2,A10,A11], 사회적 관계 형성[A1,A12], 사회적 유대감을 갖는 것으로[A12], 사회참여를 유지함으로써 자신의 존재를 증명하고 정서적 안정감을 얻는 '사회참여를 통한 사회적 유대감을 갖는 것'이 속성으로 확인되었다. 통합적 영역에서 '포괄적인 건강증진'의 속성은 높은 수준의 건강 상태[A10,A13]를 포함하며 포괄적인 건강을 높은 수준으로 유지하여 건강 악화를 방지하는 것을 포함하는 것으로 분석되었다.

3) 의학, 사회과학, 보건학 등 타 학문에서 제시된 허약노인이 인지하는 건강한 노화 영역과 속성

의학, 사회과학, 보건학 등 타 학문에서도 허약노인이 인지하는 건강한 노화에 대해 설명하고 있었으며, 분석 결과 인지적 영역, 행동적 영역, 심리적 영역, 사회적 영역, 통합적 영역의 5개 영역에 따른 6개 속성이 도출되었다(Table 2). 인지적 영역의 '허약하지 않다는 인식과 정체성 유지'의 속성은 자신의 존재감과 정체성 유지[A14,A15], 허약하지 않다는 생각을 포함하며[A16,17], 자신의 정체성을 유지하면서 스스로 허약하지 않다고 평가하는 것을 포함하였다. 행동적 영역은 스스로 조절하며 통제할 수 있는[A18,A19] '통제할 수 있는 능력을 갖는 것'과 건강 유지를 통해 독립적 생활이 가능

Table 2. Components of Frail Elderly's Healthy Aging Defined in Theoretical Phase

Classification	Category	Attribute	Content
Nursing	Cognitive	Positive beliefs and thoughts about my-self	• Perception of self-efficacy [A1,A2] • Thinking as young [A3]
	Behavioral	Able to self-manage	• Take care of health management of by self [A4,A5,A6]
		Maintenance of daily living and functional ability levels	• Maintaining the level of daily living ability [A7] • Maintaining functional ability levels [A2]
	Psychological	Not depressive condition	• No depressive symptoms [A9]
	Social	Have a social tie through social participation	• Maintenance of active social participation [A2,A10,A11] • Building a social relationships [A1,A12] • Having a social tie [A12]
	Integrative	Comprehensive health promotion	• High level of health [A10,A13]
Other disciplines	Cognitive	Awareness of not being frailty and maintenance of identity	• Maintaining one's presence and identity [A14,A15] • Thinking not being frailty [A16,A17]
	Behavioral	Having a ability to control	• Ability to self-control [A18,A19]
		Independent daily life	• No difficulty in perfoming activities of daily living [A15,A20,A21,A22] • Maintaining functional ability levels [A20,A23,A24, A25,A26]
	Psychological	Psychological well-being	• Having a psychological well-being [A14,A18,A27] • Having a resilience to stress [A28] • No depressive symptoms [A20]
	Social	Socialization through active participation in life	• Active social participation [A25] • Socialization of activities [A17,A26]
	Integrative	Physiologically healthy state	• No disease and healthy [A25,A29,A30,A31] • Maintaining and coping with natural teeth [A32]
Integration	Cognitive	Acceptance of frailty naturally	• Thinking not being frailty • Thinking as young
		Maintaining a positive identity	• Perception of self-efficacy • Maintaining of positive identity
	Behavioral	Have a self-management skills	• Ability to take care of one's own health • Ability of self-control
		Independent daily life	• Maintaining functional ability levels • No difficulty in performing activities of daily living • Maintaining functional ability levels
	Psychological	Psychological well-being	• Having a psychological well-being • Having a resilience to stress
		No depressive symptoms	• No depressive condition • No depressive symptoms
	Social	Formation of social bond through active social participation	• Active social participation • Building a social relationships • Socialization of activities • Having a social tie
	Integrative	Comprehensive health promotion	• High level of health • Maintaining and coping with natural teeth
		Physiologically healthy state	• No disease and healthy

한[A15,A20-A22] '독립적인 일상생활이 가능한 상태'가 포함되었다. 심리적 영역의 '심리적 웰빙' 속성은 심리적 안녕감 보유[A14, A18,A27], 스트레스에 대한 회복력을 지님[A28], 우울하지 않은 상태를 포함하며[A20], 심리적 안녕감을 유지하며 스트레스 요인에 대해 회복할 수 있는 탄력성을 가지는 것으로 확인되었다. 사회적 영역

은 '삶에 적극적 참여를 통한 사회화'가 속성으로 확인되었으며, 이는 적극적인 사회참여와[A25] 활동의 사회화[A17, 26]를 포함한다. 마지막으로 포괄적 영역의 '생리적으로 건강한 상태' 속성은 질병이 없고 생리적으로 건강한 상태[A25,A29-A31]와 자연 치아의 유지 및 대처를[A32] 포함하는 것으로 분석되었다.

4) 이론적 단계에서 확인된 허약노인이 인지하는 건강한 노화 영역과 속성 및 잠정적 정의

이론적 단계에서 간호학과 타 학문의 문헌을 체계적으로 고찰하여 도출한 영역과 속성을 비교·검토한 결과 간호학과 타 학문 모두에서 인지적 영역, 행동적 영역, 심리적 영역, 사회적 영역, 통합적 영역의 5개 영역이 동일하게 확인되었다(Table 2). 간호학의 인지적 영역에서 도출된 '자신에 대한 긍정적인 믿음과 생각' 속성과 타 학문에서 도출된 '허약하지 않다는 인식과 정체성 유지'는 각 속성의 특성에 따라 '허약함을 자연스럽게 수용하는 것'과 '자신에 대한 긍정적인 정체성 유지'의 2개 속성으로 분류하였다. 행동적 영역의 경우 타 학문에서 '통제할 수 있는 능력을 갖는 것'의 속성은 간호학에서의 '자기관리를 해낼 수 있는 상태'의 속성에 포함되므로 '스스로 자기관리를 할 수 있는 능력 보유'로 재명명하였으며, 간호학의 '일상생활능력과 기능적 능력 수준의 유지' 속성은 타 학문의 '독립적인 일상생활이 가능한 상태' 속성에 포함되므로 '독립적인 일상생활이 가능한 상태'의 속성으로 분류하였다. 심리적 영역의 경우 간호학에서 도출된 '우울하지 않은 상태'의 속성과 타 학문에서 도출된 '심리적 웰빙'의 속성을 각각 '심리적 웰빙'과 '우울하지 않은 상태'의 2개 속성으로 분류하였다. 사회적 영역의 경우 도출된 각 속성이 사회참여를 통한 사회화에서 일부 유사한 부분이 있어 '적극적인 사회참여를 통한 사회적 유대감을 가짐'의 속성으로 재명명하였다. 통합적 영역은 각각 '포괄적인 건강증진'과 '생리적으로 건강한 상태'의 2개 속성으로 분류하였다. 따라서, 이론적 단계에서 문헌 고찰을 통해 확인된 허약노인이 인지하는 건강한 노화는 인지적, 행동적, 심리적, 사회적, 통합적 영역에 따라 허약하지 않다는 긍정적인 정체성을 가지고, 자기관리를 통해 독립적인 일상생활 수행이 가능할 뿐만 아니라, 심리적 웰빙과 생리적으로 건강한 상태에서 적극적인 사회참여를 통해 사회적 유대감을 형성하여 포괄적인 건강증진을 하게 되는 통합적인 건강 상태를 말한다.

2. 현장작업 단계에서 나타난 허약노인이 인지하는 건강한 노화에 대한 영역과 속성 확인

현장작업 단계에서 허약노인이 인지하는 건강한 노화에 대해 인지적 영역, 행동적 영역, 심리적 영역, 독립적 영역의 4개 영역에 따라 7개 속성이 도출되었다(Table 2).

1) 영역 1: 인지적(cognitive) 영역

인지적 영역에는 '상대적 건강 상태'와 '지금의 건강에 대한 인내'의 2개 속성이 도출되었다. 과거 또는 다른 사람과 비교한 건강 상태를 통해 허약하지 않거나 잘 늙어가고 있다고 생각하거나 지금의 건강 상태를 받아들인 후 참고 견디는 것을 의미하였다.

(1) 상대적 건강 상태

'상대적 건강 상태'의 속성에는 '과거 또는 다른 사람과 비교한 건강'과 '잘 늙어가고 있다는 인식'이 분류되었다. 본인의 과거 건강과 비교하여 건강에 대한 변화를 확인하거나, 주변의 다른 사람들의 건강 상태와 비교를 통해 건강을 평가하였고, 스스로 허약하지 않으며 잘 늙어가고 있다는 인식을 통해 건강하게 늙어간다고 생각하였다.

다른 사람들은 많이 아프다 그랬는데, 네, 저는 그래도 특별히 뭐 아픈 데는 없어요. (참여자8)
내가 너무 허약하다 이런 생각 안 해보고, 올해 이러면 내년엔 좀 더 괜찮겠지? 긍정적으로 살아요. (참여자2)
잘 늙어간다고 생각하는 거지. 아프지 않고 잘 늙어가는 게 딱 낼모레면 70이잖아. (참여자6)

(2) 현재의 건강에 대한 수용

'현재의 건강에 대한 수용'의 속성에는 '허약함을 받아들임'이 분류되었다. 참여자들은 건강한 노화에 대해 현재의 건강 상태를 받아들인 후 지금의 모습을 친구처럼 여기고 지내는 것이나 참고 견디는 힘이 존재하기를 바라기도 하였다. 지금보다 더 아프지 않고, 견디고 참는 것을 통해 현재 상태를 감당하면서 삶을 유지하는 모습을 건강한 노화라고 표현하였다.

정 안 나으면 친구 삼아서 살아야지. 그래, 이대로 살으라고 그러나 보다.' 받아들여야지. 그냥 이렇게 살아야지, 그냥 그렇게 생각해. (참여자2)
최선을 다해서 하는 데까지 모든 방법을 찾아가지고 그냥 견디고 참고 나가 봐야지. (참여자5)
이제 이제 늙는다는 이제 갈 날 가게 되면 건강해지진 않겠지. 점점 더 갈수록 좋아지는 사람은 없는 것 같아. 그냥 이대로 잘 유지하고 살고 싶지요. (참여자8)

2) 영역 2: 행동적(behavioral) 영역

행동적 영역에는 '노년의 품위 유지', '더 나은 건강을 위한 노력'의 2개 속성이 도출되었다. 참여자들은 남부끄러운 모습을 보이고 싶지 않으며, 더 나은 건강을 위한 노력으로 아프지 않은 몸을 바라거나 스스로 건강관리를 위해 노력하여 더 나은 건강을 소망하는 것을 건강한 노화로 표현하였다.

(1) 노년의 품위 유지

'노년의 품위 유지' 속성에는 '부끄럽지 않은 삶'이 분류되었다. 참여자들은 스스로 건강하지 못하다고 느끼는 부분을 남부끄러워 하며 타인에게 보이고 싶어하지 않았다. 즉, 참여자들은 건강한 노화를 부끄럽지 않은 삶을 통해 노년의 품위를 유지하는 것으로 표현하였다.

교회를 가고 싶어도 누가 차로 태워다 줘도 남편이 차로 태워다 준다고 해도 내가 여러 사람 보기에 막 너도나도 인사하고 이라면은 남부끄러워서 못 가고 있는 거야. 못 가는거야, 그래서. 부끄러워서. (참여자5)

이렇게 막 수그려야 되고. 막 허리 구부정해갖고 꼬부라져야 되고 하니까 남부끄럽지⋯ (참여자5)

(2) 더 나은 건강을 위한 노력

'더 나은 건강을 위한 노력'의 속성에는 '아프지 않은 몸', '스스로 건강관리를 위해 노력함', '더 나은 건강을 바라봄'이 분류되었다. 참여자들은 건강한 노화에 대해 아프지 않은 몸을 바라면서, 건강에 대한 염원과 바람을 드러냈다. 건강해져야 하는 여러 이유들을 말하며 지금보다 더 나은 건강을 소망하는 것으로 건강한 노화를 표현하였다.

잘 늙어가려면은. 글쎄 내가 내 관리가 잘 할 수 있어야 되는 그런 모습이 돼서 늙어가야 되는데. (참여자5)

안 아팠으면 좋겠어. 안 아팠으면 그냥 내가 저런 일 다 하겠어⋯ 지금 아프니게 못해요. (참여자6)

건강하기 위해서⋯ 운동도 하고⋯ 목표는⋯ 내 몸을 내가 잘 지켜서 운동도 의사들이 하라는 대로 하고, 또, 식생활도 그렇고 과식 않고 적당량, 이렇게 해서 하는거지. (참여자7)

3) 영역 3: 심리적(psychological) 영역

심리적 영역에는 '삶에 대한 긍정적 수용'의 1개 속성이 도출되었다. 편안한 마음을 가지고 긍정적으로 사는 것으로, 감사하는 마음으로 일상의 소중함을 유지하며 살아가는 삶을 의미하였다.

(1) 삶에 대한 긍정적 수용

'삶에 대한 긍정적 수용'의 속성에는 '편안하고 긍정적인 마음', '반복되는 일상의 소중함'이 분류되었다. 참여자들은 편안한 마음을 가지고 하루하루 감사하며 사는 삶을 말하며, 일상생활의 의미 있는 활동을 통해 인생의 아름다움을 유지하고 건강한 노년의 삶을 지속하는 것으로 건강한 노화를 설명하였다.

그냥 항상 건강했고, 그냥 사는 게 뭐라고 할까? 뭐 그런 데 집착해가면서 살, 그럴 정도가 아니었으니깐. 그냥 건강하고, 그저 하나님 믿고, 감사하고, 원망, 불평 없고, 그저 마음은 항상 편안했어요. 지금도 마음은 되게 편안해요. 뭐 하나 없다고, 부족하다고 불평할 것도 없고, 진짜 마음은 편안해요. 하루하루 이렇게 감사하며 사는 거지. (참여자2)

허락된다면 더 살 수가 있을 텐데. 지금처럼 그저 늘 편안하게 마음 편케⋯ 그 일 좀 들고 일 좀 많이 줄이고 노동력이 절감되고 이렇게 좀 지나는 것이 늙어서는 좀 될까 싶어요. (참여자7)

4) 영역 4: 독립적(independent) 영역

독립적 영역에는 '남에게 의존하지 않는 독립적인 삶'과 '자연스러운 죽음'의 2개 속성이 도출되었다. 참여자들은 건강한 노화에 대해 자식에게 폐를 끼치지 않은 존재가 되기를 바라며 이대로 살다가 가는 것에 대해 이야기하였다.

(1) 자녀에게 의존하지 않는 삶

'자녀에게 의존하지 않는 독립적인 삶'의 속성에는 '자식에게 피해가 되지 않는 삶'이 분류되었다. 참여자들은 건강한 노화에 대해 이야기하며 자식들에게 피해를 주지 않는 죽음이 보람차다고 생각하거나 자식이 고통을 느끼지 않기를 바라는 마음을 표현하며, 자녀들에게 폐 끼치지 않기 위해 건강을 다스려야 한다고 이야기하였다. 참여자들은 건강한 노화를 통해 자식에게 부담이 되고 싶지 않은 한없는 부모의 사랑을 표현하였고, 부모 노릇에 대한 책임을 완수하고자 하였다.

그저 안 아프고, 그냥 건강하게 자식들한테 피해 안 주고, 그저 잘 먹고, 아침 잘 먹고, 저녁에 편안하게 "아, 우리 어머니 돌아가셨네?" 그게 사는 보람인 것 같아. (참여자2)

내가 아픔으로 온 식구가 비상이잖아 한마디로. 그게 싫지. 자녀들한테 고통 주니까. (참여자5)

지금은 나이가 먹으니까⋯ 지대로 늙어간다⋯ 잘 늙어가는 건⋯ 남한테 피해 안 주고 자식들한테 내가 아파도 피해 안 주고 늙는 게 좋은거 아닐까? 자식들한테 피해 주면 안 되잖아 여러 사람한테 피해 주면 안 돼. 내 스스로 내가 건강을 지키고 노력을 해야 돼지. (참여자6)

(2) 자연스러운 죽음

'자연스러운 죽음'의 속성에는 '그저 살다가 가는 것'이 분류되었다. 그저 살다가 죽는 것이 첫 번째 목표라고 말하며, 더 아프지 않고 지금의 건강을 유지하다가 가볍고 부드러운 죽음을 맞이하는 것으로 건강하게 이별하고 싶은 마음을 건강한 노화로 나타내었다.

그냥 이래 살다가 저기하는 거지. 그냥 절에 다니면서 사는 거지 그냥. (참여자1)

이렇게 살다가 죽는 거. 그게 첫째 목표지. (참여자6)

그래서 다 해봤습니다. 하나님은 이대로만 더 추하지 않고 더 아프지 않고 이대로만 잘 살다가 영감하고 같이 가게 해주세요. 한날한시는 아니어도 한날 아들이 다 덜 고생하게, 그리고 이제 아무도 못한 사람은 없지만은 정신적으로 육체적으로라도 내가 도울 수 있는 사람 돕게 해달라고. (참여자9)

현장작업 단계의 심층면담을 통해 확인된 허약노인이 인지하는 건강한 노화는 인지적, 행동적, 심리적, 독립적 영역에서 허약함을 받아들이며 다른 사람과 비교하여 건강하게 늙어간다는 생각을 가지고 부끄럽지 않은 삶을 통해 노년의 품위를 유지하며 더 나은 건강을 위

해 노력하고, 삶을 긍정적으로 조망하며 자녀에게 의존하지 않는 존재로 살다가 자연스럽게 죽음을 맞이하기를 바라는 것으로 확인되었다.

3. 최종 분석 단계에서 나타난 허약노인이 인지하는 건강한 노화 영역, 속성과 정의

1) 최종 분석된 허약노인이 인지하는 건강한 노화 영역과 속성

혼종모형의 이론적 단계에서 시행한 문헌 고찰의 결과와 현장작업 단계의 실증적 결과를 통합하여 허약노인이 인지하는 건강한 노화에 대한 정의를 내리고, 영역과 속성을 확인 후 재정리하여 최종적으로 5개 영역과 11개 속성으로 확정하였다(Table 2).

인지적 영역에서 자신에 대한 긍정적인 믿음을 유지하는 '자신에 대한 긍정적인 정체성 유지'의 속성은 자기효능감에 따라 긍정적인 자아상을 가지는 것으로 그대로 유지하였다. 스스로 젊다고 느끼며 다른 사람과 비교하여 잘 늙어가고 있다고 인식하는 것을 '스스로 바람직하다고 여기는 상대적 건강'으로 통합하였다. '허약함을 자연스럽게 수용하는 것'의 속성은 '현재의 건강에 대한 수용'에서 허약함을 받아들이는 속성과 통합하여 '허약함을 수용하는 건강'으로 재명명하여, 인지적 영역에서는 '자신에 대한 긍정적인 정체성 유지', '스스로 바람직하다고 여기는 상대적 건강'과 '허약함을 수용하는 건강'의 3가지 속성이 확정되었다. 행동적 영역에서 스스로 조절하며 건강관리를 할 수 있는 '스스로 자기관리를 할 수 있는 능력 보유'의 속성은 '스스로 건강관리를 위해 노력함'의 속성을 반영하여 '자기관리를 통한 건강 유지'의 속성으로 재명명하였다. 일상생활능력 수준을 유지하는 '독립적인 일상생활이 가능한 상태'의 속성은 남부끄러운 모습을 보이고 싶지 않은 '노년의 품위 유지'의 속성과 통합하여 '진정한 자립과 자기 존엄'의 속성으로 재명명하였다. '더 나은 건강을 위한 노력'의 속성은 더 나은 건강을 소망하는 것으로 그대로 확정하여, 행동적 영역은 '자기관리를 통한 건강 유지', '진정한 자립과 자기 존엄', '더 나은 건강을 위한 노력'의 3가지 속성으로 확정되었다. 심리적 영역에서 '심리적 웰빙'은 '삶에 대한 긍정적 수용'의 속성 내용 중 편안하고 긍정적인 마음을 내포하고 있는 속성을 반영하여 '심리적 웰빙'의 속성을 그대로 확정하였다. 우울한 증상이 없는 '우울하지 않은 상태'의 속성은 '삶에 대한 긍정적 수용'의 속성 내용 중 반복되는 일상의 소중함을 느끼는 속성과 통합하여 '삶에 대한 긍정적 수용'으로 확정하였다. 심리적 영역은 '심리적 웰빙'과 '삶에 대한 긍정적 수용'의 2가지 속성으로 확정하였다.

사회적 영역과 통합적 영역은 이론적 단계에서만 도출된 내용으로 현장작업 단계에서는 도출되지 않았다. 사회적 영역에서 '적극적인 사회참여를 통한 사회적 유대감을 가짐'의 속성은 선행연구에서 성공적 노화의 속성으로 노년기에 활동 참여의 중요성을 내포하고 있는 것을 반영하여 '사회적 유대감 형성'의 속성으로 재명명하여 확정하였다. '포괄적인 건강증진'과 '생리적으로 건강한 상태'의 속성을

포함하는 통합적 영역의 경우 이론적 단계에서만 도출된 내용으로 현장작업 단계에서 도출되지 않아 제외하였다. 독립적 영역은 이론적 단계에서는 도출되지 않았으나, 현장작업 단계에서 추가되었다. 자식에게 피해가 되지 않는 삶이되기를 원하며 '자녀에게 의존하지 않는 삶'의 속성과 그저 살다가 가는 것을 통해 '자연스러운 죽음'을 기대하는 속성은 그대로 확정하여 유지하였다.

따라서 최종적으로 확정된 허약노인이 인지하는 건강한 노화는 인지적 영역, 행동적 영역, 심리적 영역, 사회적 영역, 독립적 영역의 5개의 다차원적인 영역에 따라 11개 속성을 가지는 개념으로 확인되었다. 최종 확정된 11개의 속성은 다음과 같다. '자신에 대한 긍정적인 정체성 유지'는 긍정적인 자아상을 유지하는 것이며, '스스로 바람직하다고 여기는 상대적 건강'은 과거 또는 다른 사람과 비교한 건강을 의미하고, '허약함을 수용하는 건강'의 속성은 허약함을 받아들이거나 자연스럽게 수용하는 것을 의미한다. '자기관리를 통한 건강 유지'의 속성은 스스로 건강을 관리하여 유지하는 것을 의미하며, '진정한 자립과 자기 존엄'은 독립적인 일상생활을 통해 노년의 품위를 유지하는 것이며, '더 나은 건강을 위한 노력'의 속성은 더 나은 건강을 바라는 소망을 의미한다. '심리적 웰빙'은 심리적 안녕감과 편안한 마음을 가지는 것을 의미하며, '삶에 대한 긍정적 수용'은 반복되는 일상의 소중함을 통해 즐거움을 느끼는 것을 의미한다. '사회적 유대감 형성'의 속성은 적극적인 사회참여를 유지하여 사회적 유대감을 갖는 것을 의미한다. '자녀에게 의존하지 않는 삶'은 자식에게 피해가 되지 않는 삶을 바라는 것을 의미하였고, '자연스러운 죽음'의 속성은 가볍고 부드럽게 살다가 가기를 바라는 것을 의미하였다. 경험적 준거는 현장에서 존재하는 개념의 속성을 보여주는 것으로, Schwartz-Barcott와 Kim [14]은 혼종모형 방법의 현장작업의 결과에 따라 주어진 현상에 대해 상호 관련이 있는 개념을 정확한 관찰이 가능한 지표로 제시할 수 있음을 말하고 있다. 이에 따라 최종 분석 단계에서 허약노인이 인지하는 건강한 노화 측정도구 항목으로 활용될 수 있는 각 영역별 속성을 Table 3에 제시하였다.

2) 최종 분석된 허약노인이 인지하는 건강한 노화 정의

허약노인이 인지하는 건강한 노화는 현재의 건강 상태를 받아들이는 과정에서 스스로 건강을 인식하는 것으로, 삶을 긍정적으로 조망하면서 더 나은 건강을 소망하고, 타인과 관계를 유지하며 자녀에게 부담이 되지 않는 존재로 남아있다가 가벼운 죽음을 맞이하는 것이다. 이러한 허약노인의 건강한 노화는 노화에 따른 변화에도 허약하지 않다는 주체적인 인지를 통해 자신에 대한 긍정적인 정체성을 유지하며, 더 나은 건강을 위한 노력을 통해 노년의 품위를 유지함으로써 삶을 긍정적으로 수용하는 특성을 갖는다. 또한 자녀에게 피해를 주지 않으며 자연스럽게 죽음을 맞이하기를 바라는 허약노인의 염원이 담겨있다고 할 수 있다.

Table 3. Components of Frail Elderly's Healthy Aging Defined in the Theoretical Phase, Field Work Phase and Final Analytical Phase

Theoretical phase			Field work phase			Final phase	
Category	Attribute	Content	Category	Theme-cluster	Theme	Category	Attribute
Cognitive	Acceptance of frailty naturally	• Thinking not being frailty • Thinking as young	Cognitive	Relative health state	• Health in the past or compared to others • Awareness that I'm aging well	Cognitive	Maintaining a positive identity about oneself Relative health you consider desirable
	Maintaining a positive identity	• Perception of self-efficacy • Maintaining of positive identity		Acceptance of current health	• Acceptance of frailty		Health accepting frailty
Behavioral	Having a self-management skills	• Ability to take care of one's own health • Ability of self-control	Behavioral	Maintenance dignity in old age	• Not ashamed of life	Behavioral	Maintenance of health through self-management True self-reliance and self-dignity
	Independent daily life	• Maintaining functional ability levels • No difficulty in performing activities of daily living • Maintaining functional ability levels		Effort to better health	• Body without pain • Effort to take care of one's own health • Looking for better health		Strive for better health
	No depressive symptoms	• No depressive condition • No depressive symptoms					
Psychological	Psychological well-being	• Having a psychological well-being • Having a resilience to stress	Psychological	Positive acceptance of life	• Relaxed and positive mind • Importance of repeated daily life	Psychological	Psychological well-being Positive acceptance of life
Social	Formation of social bond through active social participation	• Active social participation • Building a social relationships • Socialization of activities • Having a social tie				Social	Building a social relationships
Integrative	Comprehensive health promotion	• High level of health • Maintaining and coping with natural teeth	Independent	Life without dependence on children	• A life without harm to children	Independent	Life without dependence on children
	Physiologically healthy state	• No disease and healthy		Natural death	• Just live and going		Natural death

논의

본 연구는 혼종모형을 사용하여 허약노인이 인지하는 건강한 노화를 이해하고, 개념의 본질과 속성을 규명하고자 수행되었다. 허약노인이 인지하는 건강한 노화는 이론적 단계와 현장작업 단계에서 모두 인지적 영역, 행동적 영역, 심리적 영역이 확인되었으며, 사회적 영역의 속성은 이론적 단계에서만 확인되었고, 독립적 영역은 현장작업 단계에서 새롭게 확인되었다. 최종적으로 도출된 영역과 속성을 중심으로 혼종모형 개념분석의 각 결과를 논의하고자 한다.

본 연구의 인지적 영역에서 허약노인은 허약함을 받아들이는 과정에서 긍정적으로 건강을 인식하는 속성이 뚜렷이 나타나고 있었다. 허약노인이 인지하는 건강은 스스로 바람직하다고 여기는 건강에 더불어 타인과 비교·평가한 상대적 건강의 속성을 포함하고 있었는데, 이는 건강한 노화가 자신의 인식뿐만이 아니라 타인에 대한 인식도 함께 포함됨을 나타낸다. 본 연구에서 허약노인은 자신보다 더 건강 상태가 좋지 않다고 여겨지는 타인과 비교하여 건강에 대한 긍정적인 믿음을 형성하였으며, 이는 기존의 연구에서 허약노인이 자신보다 못하다고 느껴지는 대상과 하향 비교를 통해 심리적 안녕감을 얻는다는 결과와 일치하였다[20]. 또한 신체적 허약함에도 불구하고 스스로 젊다고 인식함을 강조하였다. 즉, 허약함에 대한 임상적 이해와 허약함을 인식하는 방식의 불일치는 건강한 노화를 위해 허약노인 스스로 인지하는 건강에 대한 태도와 인식이 주요한 점이라는 것을 시사한다[21]. 이는 한국 노인들이 인식하는 성공적 노화 속성인 '가족을 포함한 다른 사람들과의 관계를 통한 존재 의미', '자신이 속한 집단의 평가를 통해 삶의 가치를 가늠함', '자녀의 성공을 자신의 성공적 노화에 결부시킴'과 차이가 있었다[22]. 성공적 노화 개념은 노인이 속해있는 문화적·계층적 맥락을 내포하는 개념으로 세대적인 가치관과 삶에 대한 태도 등과 결부되어 있었다[22]. 건강한 노화는 성공적 노화에 비해 건강을 유지하고 촉진하는 건강증진과 더욱 관련이 있으며, 특히 허약노인에게 있어 스스로 인지하는 건강에 따라 건강한 노화 여부가 결정될 수 있다. 노인에게 있어 스스로 인지하는 건강 인식이 좋을수록 더 높은 건강증진 행위를 수행하며 건강 관련 삶의 질이 높게 나타나게 된다[20]. 따라서 허약노인 자신이 허약하다는 고정관념을 탈피하여 건강한 노화에 이를 수 있도록 스스로 내면의 긍정적 강화를 돕는 동시에 적절한 건강 기준선을 정하여 심리적 안녕감을 얻는 것으로 허약노인의 건강한 노화를 이해하는 것이 타당함을 확인할 수 있다.

행동적 영역에서 허약노인들은 스스로 관리를 통해 건강을 유지하는 것을 건강한 노화로 인식하였으며, 이를 통해 다른 사람에게 부끄러운 모습을 보이지 않고 노년의 품위를 유지하는 것이 중요한 요인임을 나타내고 있었다. 또한 현재의 건강을 유지하는 바람을 나타냄과 동시에 더 나은 건강을 소망하기까지 하였는데, 이는 허약노인에게 더욱 건강한 노화가 필요함을 시사한다. 허약노인들은 독립적인

일상생활에서 조화와 균형을 유지하는 삶을 건강한 노화로 표현하였다[23]. 즉, 허약노인이 인지하는 건강한 노화는 허약함에도 불구하고 더 나은 건강을 바라보며 지속적으로 노력하는 것으로, 노인 자신의 관점에서 물리적 현실을 초월하는 것이라고 생각될 수 있다.

심리적 영역에서 심리적 안녕감을 가지는 상태의 속성은 이론적 단계와 현장작업 단계에서 모두 확인할 수 있었는데, 이는 노인이 잘 늙어간다는 개념에 대해 장애의 부재보다 심리사회적 요인을 강조한 기존의 연구 결과와 부합한다[24]. 특히 본 연구에서 확인된 일상생활에서 반복되는 일들을 통해 심리적 안정감을 얻는 속성은 허약노인이 일상에서의 활동을 통해 마음의 균형을 이루고 안정 상태를 유지하는 것으로 이해할 수 있다. 즉, '심리적 웰빙'과 '삶에 대한 긍정적 수용'의 속성은 지혜롭게 나이드는 것으로, 정서적 항상성을 유지하며 관용을 가지는 태도로 허약노인의 건강한 노화 개념을 이해하는 것이 타당할 것으로 판단된다[25].

사회적 영역과 통합적 영역은 이론적 단계에서만 확인되었다. 노인에게 있어 건강한 노화는 신체 건강과 기능, 여가 및 사회활동, 사회적 관계 및 접촉을 유지하는 것으로 여겨지기도 한다[26]. 따라서 본 연구에서 사회적 영역의 '사회적 유대감 형성'의 속성이 이론적 단계에서만 확인되었음에도 최종 분석에 포함하였는데, 현장작업 단계에서 확인되지 않아 한국적 맥락에서 차이가 있는지 추후 연구가 필요할 것으로 생각된다.

독립적 영역에서는 자식에게 피해가 되지 않기를 원하며, 자연스러운 죽음을 바라는 속성을 확인할 수 있었다. 기존의 연구에서도 성공적 노화와 좋은 죽음을 함께 언급하고 있는데[27], 본 연구에서도 허약노인들이 건강한 노화에 대해 건강하게 나이드는 것 너머의 죽음과 연관 짓는 속성이 유사하였다. 특히 모든 삶과 죽음이 자녀와 연관되며 건강한 노화의 중요한 요소로 작용하는 것은 한국 사회의 문화적 가치와 일치하는 것으로 확인할 수 있다[28]. 즉, 허약노인들은 건강한 노화를 통해 자식에게 부담이 되고 싶지 않은 염원과 죽음을 자연스럽게 맞이하기를 원하는 부모의 마음을 표현하고 있었으며, 이는 한국적 특성을 반영하여 현장작업 단계에서 새롭게 확인된 속성으로 추가하였다.

본 연구는 혼종모형 개념분석을 활용하여 허약노인이 인지하는 건강한 노화의 다차원적인 특성과 속성을 규명하고 개념에 대한 정의와 속성별 경험적 준거를 제시하여 허약노인이 인지하는 건강한 노화 측정 도구의 개념적 기틀을 제공한 의의가 있다. 본 연구에서 제시된 속성들과 특히 한국 허약노인의 특성으로 나타나는 부분에 초점을 맞추어 허약노인의 건강한 노화를 사정한다면 그에 맞는 중재 및 돌봄 서비스를 계획하여 유용할 것으로 기대한다. 본 연구 결과 혼종모형 개념분석을 통한 허약노인의 인지하는 건강한 노화 속성 중 현장작업 단계에서 9인의 허약노인 참여자의 심층면담을 통해 허약노인이 인지하는 건강한 노화의 본질과 속성을 확인하였으나 기존 연구에서 노인에게 있어 중요하다고 알려진 사회적 영역의 속성이 드

러나지 않았다. 그 이유로서 본 연구에서 참여한 대상자의 성별이 여성에 편중되었던 점과 더불어 연구 참여자들이 허약노인인 점을 감안하여 1회의 심층면담을 통해 자료의 포화도를 판단하였는데 면담 횟수나 참여자 관찰 등의 방법론 측면에서 자료의 포화가 제한적일 수 있었음을 고려할 수 있다. 추후 다양한 특성의 허약노인을 대상으로 심층면담과 더불어 추가 연구 방법을 사용한 연구를 제언한다.

결론 및 제언

본 연구는 혼종모형을 이용하여 허약노인이 인지하는 건강한 노화의 본질과 속성을 확인하기 위하여 분석한 연구이다. 연구 결과 허약노인이 인지하는 건강한 노화 정의는 현재의 건강 상태를 받아들이는 과정에서 스스로 바람직하다고 건강을 인식하는 것으로, 삶을 긍정적으로 조망하면서 더 나은 건강을 소망하고, 타인과 관계를 유지하며 자녀에게 부담이 되지 않는 존재로 남아있다가 자연스러운 죽음을 맞이하는 것으로 나타났다. 허약노인이 인지하는 건강한 노화는 인지적 영역, 행동적 영역, 심리적 영역, 사회적 영역, 독립적 영역의 5개 영역과 11개 속성으로 구성된 다차원적 개념으로 인지적 영역은 자신에 대한 긍정적인 정체성 유지, 스스로 바람직하다고 여기는 상대적 건강, 허약함을 수용하는 건강의 3개 속성, 행동적 영역은 자기관리를 통한 건강 유지, 진정한 자립과 자기 존엄, 더 나은 건강을 위한 노력의 3개 속성, 심리적 영역은 심리적 웰빙, 삶에 대한 긍정적 수용의 2개 속성, 사회적 영역은 사회적 유대감 형성의 1개 속성, 독립적 영역은 자녀에게 의존하지 않는 삶과 자연스러운 죽음의 2개 속성을 포함한다. 향후 허약노인이 인지하는 건강한 노화 개념의 다차원적인 속성에 대해 더욱 깊이 있는 연구를 실행하여 개념의 속성을 반영하는 측정도구 개발과 함께 이를 바탕으로 허약노인이 인지하는 건강에 맞춘 중재 프로그램 개발에 기초자료로 활용할 것을 제언한다.

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Authors' contribution

Study conception and funding acquisition - RS; Data collection - JSS and AHR; Analysis and interpretation of the data - JSS and AHR; Drafting and critical revision of the manuscript - JSS and RS; Writing-editing and final approval - RS

Conflict of interest

No existing or potential conflict of interest relevant to this article was reported.

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Data availability

Please contact the corresponding author for data availability.

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REFERENCES

1. Bowling A, Dieppe P. What is successful ageing and who should define it? BMJ. 2005;331(7531):1548-51. https://doi.org/10.1136/bmj.331.7531.1548
2. Lee Y, Jun HJ, Park H, Joo S. The moderating effect of gender on the association between spousal and child relationship satisfaction and successful aging among older adults. Journal of the Korean Gerontological Society. 2020;40(6):1287-305. https://doi.org/10.31888/JKGS.2020.40.6.1287
3. Park BJ, Lee YJ. Integrative approach to elderly frailty. Korean Journal of Family Medicine. 2010;31(10):747-54. https://doi.org/10.4082/kjfm.2010.31.10.747
4. Attard A. The Federal Council on Aging: new priorities. The Gerontologist. 1983;23(2):117-9. https://doi.org/10.1093/geront/23.2.117
5. Park JS, Oh YJ. Health promotion behavior, perceived health status, social participation and empowerment in frail elderly receiving home visiting services. Journal of Korean Public Health Nursing. 2017;31(2):244-56. https://doi.org/10.5932/JKPHN.2017.31.2.244
6. Slaets JP. Vulnerability in the elderly: frailty. The Medical clinics of North America. 2006;90(4):593-601. https://doi.org/10.1016/j.mcna.2006.05.008

7. 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, Biological Sciences and Medical Sciences. 2004;59(3):255-63. https://doi.org/10.1093/gerona/59.3.m255

8. Baltes PB, Baltes MM. Psychological perspectives on successful aging: The model of selective optimization with compensation. In: Baltes PB, Baltes MM, editors. Successful aging: Perspectives from the behavioral sciences. Cambridge University Press; 1990. p. 1-34. https://doi.org/10.1017/CBO9780511665684.003

9. Rowe JW, Kahn RL. Successful aging. The Gerontologist. 1997;37(4):433-40. https://doi.org/10.1093/geront/37.4.433

10. Chung KH, Han KH, Kim JS, Lim JK. Critical approaches to 'successful aging' discourse. Research Report. Korea Institute for Health and Social Affairs; 2006 December. Report No. 2006-16.

11. Strawbridge WJ, Wallhagen MI, Cohen RD. Successful aging and well-being: self-rated compared with Rowe and Kahn. The Gerontologist. 2002;42(6):727-33. https://doi.org/10.1093/geront/42.6.727

12. Ebrahimi Z, Wilhelmson K, Moore CD, Jakobsson A. Frail elders' experiences with and perceptions of health. Qualitative Health Research. 2012;22(11):1513-23. https://doi.org/10.1177/1049732312457246

13. Hansen-Kyle L. A concept analysis of healthy aging. Nursing Forum. 2005;40(2):45-57. https://doi.org/10.1111/j.1744-6198.2005.00009.x

14. Schwartz-Barcott D, Kim HS. An expansion and elaboration of the hybrid model of concept development. In: Rodgers BL, Knafl KA, editors. Concept development in nursing: Foundations, techniques, and applications. 2nd ed. Saunders; 2000. p. 129-59.

15. Jung HW, Yoo HJ, Park SY, Kim SW, Choi JY, Yoon SJ, et al. The Korean version of the FRAIL scale: clinical feasibility and validity of assessing the frailty status of Korean elderly. The Korean Journal of Internal Medicine. 2016;31(3):594-600. https://doi.org/10.3904/kjim.2014.331

16. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. Qualitative Health Research. 2005;15(9):1277-88. https://doi.org/10.1177/1049732305276687

17. Sandelowski M. The problem of rigor in qualitative research. Advances in Nursing Science. 1986;8(3):27-37. https://doi.org/10.1097/00012272-198604000-00005

18. National Institute of Korean Language. Standard Korean Dictionary [Internet]. National Institute of Korean Language; [cited 2023 Apr 12]. Available from: https://stdict.korean.go.kr/main/main.do

19. Oxford University Press. The Oxford English Dictionary [Internet]. Oxford University Press; [cited 2023 April 12]. Available from: https://www.oed.com

20. Kim J, Yang HM, Kang P, Choi JE. Self-rated health of frail elders. Journal of Korean Gerontological Nursing. 2015;17(2):98-107. https://doi.org/10.17079/jkgn.2015.17.2.98

21. Warmoth K, Lang IA, Phoenix C, Abraham C, Andrew MK, Hubbard RE, et al. 'Thinking you're old and frail': a qualitative study of frailty in older adults. Ageing & Society. 2016;36(7):1483-500. https://doi.org/10.1017/S0144686X1500046X

22. Seo SY. The perception of successful aging among korean elderly. Journal of Families and Better Life. 2005;23(2):1-10.

23. Ebrahimi Z, Wilhelmson K, Eklund K, Moore CD, Jakobsson A. Health despite frailty: exploring influences on frail older adults' experiences of health. Geriatric Nursing. 2013;34(4):289-94. https://doi.org/10.1016/j.gerinurse.2013.04.008

24. Reichstadt J, Sengupta G, Depp CA, Palinkas LA, Jeste DV. Older adults' perspectives on successful aging: qualitative interviews. The American Journal of Geriatric Psychiatry. 2010;18(7):567-75. https://doi.org/10.1097/jgp.0b013e3181e040bb

25. Meeks TW, Jeste DV. Neurobiology of wisdom: a literature overview. Archives of General Psychiatry. 2009;66(4):355-65. https://doi.org/10.1001/archgenpsychiatry.2009.8

26. Bowling A. Enhancing later life: how older people perceive active ageing? Aging & Mental Health. 2008;12(3):293-301. https://doi.org/10.1080/13607860802120979

27. Teater B, Chonody JM. How do older adults define successful aging? A scoping review. International Journal of Aging & Human Development. 2020;91(4):599-625. https://doi.org/10.1177/0091415019871207

28. Kim MH, Shin KR, Kang MS, Kang I. A study of successful aging experience of Korean elderly. Journal of the Korea Gerontological Society. 2004;24(2):79-95.

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고혈압 노인을 위한 노인복지관 중심 통합 복약관리 프로그램의 개발 및 효과: 횡단적 단면연구

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Development and effectiveness of an integrated medication management program centered on senior welfare centers for older adults with hypertension: A cross-sectional study

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Purpose: The purposes of this study were to develop an integrated online and offline medication management program and to examine the program's effects of the program for older adults with hypertension residing in the community. **Methods:** A nonequivalent control group pretest-posttest design was used. Participants were 57 older adults with hypertension (intervention group: 29, control group: 28). The experimental group participated in the medication management program, which included the following: verbal and video education, individual counseling, and using medication note over 3 weeks. Collected data were analyzed using the SPSS/WIN 22.0 program. The data were analyzed by Generalized Estimation Equation. **Results:** Statistically significant differences were found between the experimental and control groups in terms of their knowledge of hypertension and self-efficacy for appropriate medication. **Conclusion:** The integrated medication management program was effective as indicated in knowledge of hypertension and self-efficacy for appropriate medication. Future studies are required to explore the medication management program's effects on older adults with hypertension using more rigorous research methods.

Keywords: Hypertension; Aged; Medication adherence; Medication therapy management

서론

1. 연구의 필요성

국내 65세 이상 노인의 고혈압 추정 유병자는 약 495만 명이며[1], 2021년 조사에 따르면 국내 70세 이상 노인의 66.4%가 고혈압으로 전년도 대비 6.3% 증가하였다[2]. 노인에게 고혈압은 흔하고 중요한 건강 문제로, 고혈압 노인이 혈압을 적정수준으로 관리하지 않을 경우 뇌졸중, 관상동맥질환과 같은 심뇌혈관 질환 합병증으로 인한 사망 위험이 증가한다[3]. 고혈압 치료는 목표혈압 달성을 위해 적극적인 생활요법 및 약물치료가 권고되며, 고혈압 약물을 잘 복용하는 환자의 혈압이 조절될 확률은 약을 잘 복용하지 않는 환자보다

3.4배 높았다[4]. 고혈압 치료에 있어서 약물치료가 중요함에도 불구하고 지역사회 노인 고혈압 환자 중 고혈압 약물을 복용하지 않는 비율이 50.2%로 조사되었으며[5], 약물을 제대로 복용하더라도 노인의 경우 어지럼증, 저혈압 등 다양한 증상을 경험할 수 있어 젊은 환자들보다 더 많은 관찰이 필요하다[6]. 하지만 최근 독거노인 또는 노인부부의 가족형태가 증가하여 과거와 달리 노인들이 가족의 도움 없이 스스로 약물을 복용해야 하는 경우가 많아[7] 지역사회 노인을 대상으로 한 약물관리 교육의 필요성이 더욱 높아지고 있다.

노인 대상의 복약관리 교육은 노인의 약물지식 및 약물 복약 이행도 증진에 기여하며[8], 고혈압 교육에 참여한 노인 고혈압 환자군은 참여하지 않은 군에 비해 12.4배 약물 복용 이행이 높았다[9]. 그럼에도 현재까지 국내에서 지역사회 노인을 대상으로 복약관리 프로그램을 한 연구의 수가 많지 않고 고혈압 노인을 대상으로 한 중재 연구[10,11]는 더욱 적어, 최근 증가하고 있는 노인 고혈압 유병률을 고려하였을 때[2] 더 많은 중재 연구의 시도가 필요하다.

성공적인 혈압관리를 위해서는 노인의 약물치료 이행도를 증진하여야 하는데[4] 이에 부정적인 영향을 주는 요인으로 약물에 대한 지식 부족[12], 약물 복용에 대한 낮은 자기효능감[13], 의료인과의 부족한 의사소통[14] 등이 확인되었다. 약물에 대한 지식 부족은 약물 이행을 저해하는 주요 요인으로, 노인의 신체 및 인지적 변화와 특성을 고려하여 대상자가 이해하기 쉬운 교육을 진행해야 한다[8].

약물치료 이행도를 향상시키는 것은 건강 행위를 변화시키는 과정으로, 복약순응증진 행위 변화를 중재하기 위해서는 복약 관련 자기효능감 향상을 위해 자기효능자원을 활용하는 것이 유용하다[10]. 선행연구[10]에서는 Bandura가 1977년 언급한 성취 경험, 언어적 설득 등의 자원을 활용한 복약관리 프로그램에 참여한 중재군이 대조군보다 약물치료 이행도가 유의하게 높았다. 또한 노인의 경우 처음에는 약을 잘 복용하더라도 시간이 경과함에 따라 의료진과 의사소통을 하지 않고 스스로 약을 중단하거나 약물 복용 시간과 약물 용량을 변경하는 경우가 많아[4] 노인 대상의 복약교육에서는 의료진과의 의사소통 증진을 포함하는 것이 효과적이다[7].

국내 고혈압 환자의 복약 이행 증진과 관련한 선행연구들에서 교육, 개별상담, 복약 보조도구의 활용, 약물목록 작성 등을 복합적용하였을 때 약물치료 이행도와 관련하여 긍정적인 결과를 확인하였다[8,10,11]. 따라서 한 가지의 방법만을 적용하는 단일중재보다 통합적인 복약관리 중재가 더욱 효과적임을 알 수 있으며, 교육의 제공 방식은 COVID-19로 인한 팬데믹이 장기화되면서 감염 예방을 위해 노인을 대상으로 한 건강교육 또한 온라인 방식이 활성화되고 있는 추세이다. 시간과 장소에 구애받지 않고 반복학습이 가능한 장점을 가진 온라인 방식을 여러 선행연구들에서 검증된 개별상담과 복약교육, 보조도구의 활용 등을 통합한 프로그램에 적용한다면 고혈압 노인의 복약 이행 증진에 더욱 효과적일 것이라 기대되나 이와 관련한 중재 연구는 찾아보기 어려웠다.

지역사회에 거주하는 노인들은 지속적 건강관리를 위해 노인복지관을 방문하고 있으며, 2023년 기준 노인복지관은 전국 366개소에 69,786명의 노인이 이용하고 있는 실정이다[15]. 많은 수의 노인이 이용하는 노인복지관의 접근성을 통해 지지체계가 부족한 지역사회 노인에게 효과적인 복약관리 프로그램을 제공할 수 있을 것이라 기대한다.

이에 따라 본 연구는 노인복지관을 중심으로 한 통합 복약관리 프로그램을 개발·적용한 뒤, 그 효과를 확인하고 노인복지관 간호사에 의한 만성질환관리 프로그램의 질적 향상을 위한 기초자료를 제공하고자 시도되었다.

2. 연구목적

본 연구의 목적은 노인복지관을 이용하는 고혈압 노인을 대상으로 노인복지관 중심 통합 복약관리 프로그램을 적용한 후 고혈압 지식, 복약자기효능감, 의료진과의 의사소통 자신감, 고혈압 약물치료 이행도에 미치는 효과를 확인하고자 하며, 구체적인 목적은 아래와 같다.

하나, 지역사회 고혈압 노인을 대상으로 노인복지관 중심 통합 복약관리 프로그램을 개발한다.

둘, 노인복지관 중심 통합 복약관리 프로그램이 지역사회 고혈압 노인의 고혈압 지식, 복약자기효능감, 의료진과의 의사소통 자신감, 고혈압 약물치료 이행도에 미치는 효과를 검증한다.

3. 연구가설

본 연구를 통해 검증할 가설은 아래와 같다.

가설 1. 노인복지관 중심 통합 복약관리 프로그램에 참여한 실험군은 프로그램에 참여하지 않은 대조군에 비해 고혈압 지식 점수 점수가 높을 것이다.

가설 2. 노인복지관 중심 통합 복약관리 프로그램에 참여한 실험군은 프로그램에 참여하지 않은 대조군에 비해 복약자기효능감 점수가 높을 것이다.

가설 3. 노인복지관 중심 통합 복약관리 프로그램에 참여한 실험군은 프로그램에 참여하지 않은 대조군에 비해 의료진과의 의사소통 자신감 점수가 높을 것이다.

가설 4. 노인복지관 중심 통합 복약관리 프로그램에 참여한 실험군은 프로그램에 참여하지 않은 대조군에 비해 고혈압 약물치료 이행도 점수가 낮을 것이다.

연구방법

1. 연구설계

본 연구는 노인복지관 중심 통합 복약관리 프로그램이 고혈압이 있는 노인의 고혈압 지식, 복약자기효능감, 의료진과의 의사소통 자신감, 고혈압 약물치료 이행도에 미치는 효과를 검증하기 위한 비동등성 대조군 전후설계를 적용한 유사실험연구이다.

2. 연구대상

본 연구의 대상은 서울특별시에 소재한 1개의 노인복지관 및 어르신취업지원센터를 통해 모집 공고 후 의사로부터 고혈압 진단을 받고 항고혈압제를 1년 이상 복용하고 있는 만 65세 이상 노인 중 연구 목적을 이해하고 인지장애, 기질적 뇌질환이나 정신질환이 없이 의사소통이 가능하며 읽고 쓰기가 가능한 자를 근접 모집단으로 표집하였다. 확산효과를 방지하기 위해 노인복지관 이용자를 실험군에, 어르신취업지원센터 이용자를 대조군에 편의 표집하였다. 표본의 크기는 G*power 3.1.9.4 프로그램을 이용하였으며 연구에서 필요한 대상자 수는 두 집단의 평균차이를 비교하는 선행연구[16]를 근거로 효과크기 .4, 유의수준 .05, 검정력 .08을 기준으로 산출한 결과 실험군과 대조군 각각 26명으로 총 52명이었다. 그러나 20%의 탈락률을 고려하여 실험군, 대조군 각각 33명, 총 66명으로 연구대상을 산

정하였다. 본 연구에서 탈락자는 3회의 중재프로그램과 3회의 조사중 1회라도 불참한 경우 제외하였으며 건강의 악화(3명) 및 개인사정(5명), 불성실한 답변(1명)으로 실험군 4명, 대조군 5명이 탈락하여 실험군 29명, 대조군 28명 총 57명이 최종 통계분석에 이용되었다 (Figure 1).

3. 연구도구

본 연구는 구조화된 설문지를 사용하여 자료수집하였으며, 일반적 특성과 의료진과의 의사소통 자신감, 고혈압 지식, 복약자기효능감, 고혈압 약물치료 이행도를 파악할 수 있는 내용을 포함한 56문항으로 구성되었다. 각 도구는 사용 전 도구 개발자에게 사용에 대한 허락을 받은 이후 사용하였다. 본 연구도구의 내용을 구체적으로 살펴보면 다음과 같다.

1) 일반적 특성

사전 문헌고찰을 통해 약물 복용에 영향을 주는 요인으로 보고되었던 성별, 연령, 최종학력, 혼인상태, 평균 월수입을 포함하였으며, 약물 복용 개수, 약물 처방 의사 수, 약물 부작용의 경험, 고혈압을 진단받은 기간과 같은 약물 및 질병 관련 특성을 조사하였다.

2) 고혈압 지식

Park과 Hong [17]이 개발한 도구에 의해 측정하였으며 고혈압과 자기 조절의 인지적 수준을 파악하기 위한 18문항으로 구성되었다. 각 문항에 대해 대상자는 '그렇다'와 '아니다'로 응답하였다. 정답일 경우 1점, 오답일 경우 0점으로 측정하여 점수가 높을수록 고혈압에 대한 지식수준이 높은 것을 의미한다. 개발 당시 도구의 신뢰도 Cronbach's α 값은 .72였고, 본 연구에서는 .71이었다.
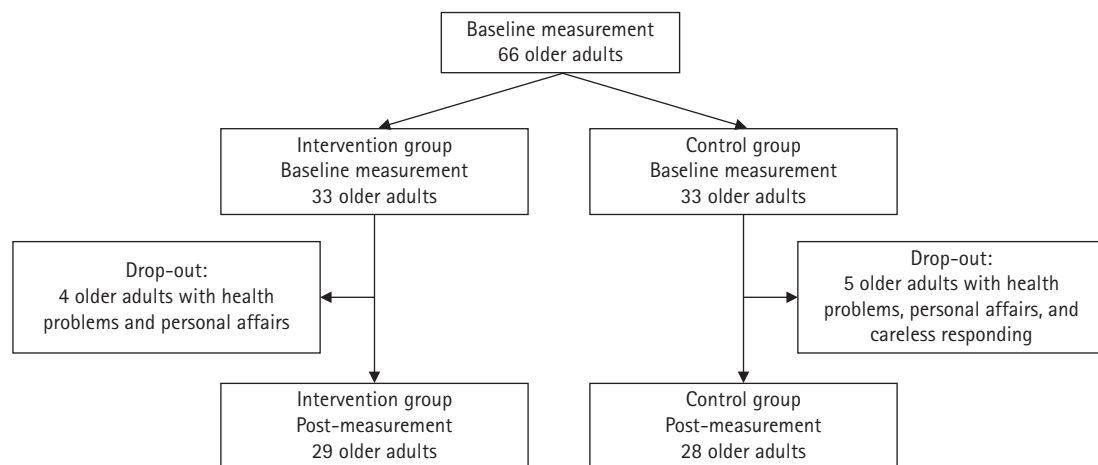

Figure 1. Flow chart of the study.

3) 복약자기효능감

Risser 등[18]이 개발한 약물 자기효능감 도구(Self-efficacy for Appropriate Medication Use Scale, SEAMS)를 Park [19]이 번안한 도구에 의해 측정하였다. 약을 복용하기 어려운 상황에서 약을 복용하는 자기효능감과 다양한 상황에서 약물을 올바르게 복용하는 자신감의 수준을 확인할 수 있는 13문항으로 구성되었으며 각 문항에 대해 그렇지 않다(1점), 그저 그렇다(2점), 매우 그렇다(3점)의 Likert 척도로 응답하였다. 점수가 높을수록 복약자기효능감이 높음을 의미한다. 개발 당시 SEAMS 도구의 신뢰도 Cronbach's α 값은 .90이었고, 본 연구에서는 .93이었다.

4) 의료진과의 의사소통 자신감

Hogan과 Kwan [20]의 의료진과의 의사소통 전략을 토대로 Lee [7]가 국내 실정에 맞게 개발한 도구를 수정·보완하였으며 간호학 분야 전문가(간호학과 교수 1인)로부터 내용 타당도를 검증하였다. 복용하는 약물관련 상담, 알레르기 및 이상반응에 대한 상담, 약물 중단에 대한 상담, 새롭게 복용한 약물 및 처방받지 않은 약물에 대한 상담에 대한 5문항으로 구성되었다. 각 문항에 대해 대상자는 전혀 그렇지 않다(1점), 보통이다(2점), 매우 그렇다(3점)의 Likert 척도로 응답하였다. 점수가 높을수록 의료진과의 의사소통 자신감이 높음을 의미한다. 선행연구[7]에서 도구의 신뢰도 Cronbach's α 값은 .72였고, 본 연구에서는 .91이었다.

5) 고혈압 약물치료 이행도

Kim 등[21]이 개발한 고혈압 약물치료 이행도 측정 도구(Hill-Bone Medication Adherence Scale, HBMA)를 Song 등[22]이 번안한 도구에 의해 측정하였다. 고혈압 약물치료 이행정도를 확인할 수 있는 8문항으로 구성되었으며 각 문항에 대해 항상(4점), 자주(3점), 가끔(2점), 전혀(1점)의 Likert 척도로 응답하였다. 점수가 높을수록 고혈압 약물치료 이행도가 낮음을 의미한다. 개발 당시 HBMA 도구의 신뢰도 Cronbach's α 값은 .80이었고, 본 연구에서는 .85였다.

4. 연구진행

1) 프로그램 개발과정

Analysis, Design, Development, Implementation, Evaluation (ADDIE) model을 이용하여 5단계의 과정(분석, 설계, 개발, 수행, 평가)으로 진행하였다.

(1) 분석

본 연구에서 통합 복약관리 프로그램 개발을 위해 2010년부터 2022년까지의 국내 복약관리 중재에 관한 통합적 문헌고찰을 수행

하였다. 문헌검색은 한국학술정보(Koreanstudies Information Service System, KISS), 누리미디어(DBpia), 학술정보서비스(Research Information Sharing Service, RISS)에 발표된 논문에서 이루어졌으며 검색어로는 노인, 고혈압, 복약, 약물관리를 입력하였다. 문헌고찰을 통해 노인의 약물 복용실태와 지역사회 노인의 복약관리 교육 요구, 효과성이 있었던 중재[8,10,11,16]를 파악하여 의미 있는 내용을 도출하였다. 최근 국내에서 개발된 고혈압 교육 자료인 대한고혈압학회에서 일반인 대상으로 제작한 고혈압 표준 슬라이드 2019 [23]와 질병청 연구사업으로 진행하고 아주대학교 의과대학에서 개정한 고혈압 표준교육자료 교육지침서(매뉴얼)[24]을 근거로 교육내용을 분석하였다.

(2) 설계

본 프로그램은 복약교육(대면 및 동영상 교육 3회), 개별상담(대면 1회, 전화 2회), 복약보조도구인 복약노트의 활용으로 구성되었다. 개별화된 개입과 복약수첩과 같은 투약보조도구는 복약관리 교육의 이해증진에 긍정적 영향을 미치며[8], 건강교육 시 동영상을 통한 교육이 의료진의 구두교육보다 대상자의 기억능력과 주의집중력을 높임으로 건강행동 변화를 가져올 수 있는 효과적인 교육방법으로 확인되었기 때문이다[25]. 또한 선행연구[8,16]에서 3주간의 프로그램 제공으로 복약증진과 관련한 유의미한 효과를 검증하였으며 이를 근거로 본 교육프로그램도 주 1회, 3주간의 교육프로그램을 설계하였다.

(3) 개발

프로그램 내용 구성을 위해 선행연구에서 효과적이었던 방법과 전략을 기반으로 세부 중재내용을 구성하였다. 회차별 교육내용은 '1회차 고혈압 바로알기', '2회차 고혈압 약물 바로알기', '3회차 의료진과의 의사소통 증진하기'로, 교육매체는 파워포인트와 동영상자료를 활용하기로 하였다(Table 1). 특히 노인 대상자에게 효과적인 고혈압 지식제공을 위해 동영상 자료는 시각적 자료를 충분히 활용하되 명확하고 단순하게 제작하였으며 회차별 대면 복약교육에서는 주제에 부합하는 긍정적인 경험과 측면에 대해 상기할 수 있는 기회를 제공할 수 있도록 하였다. 이는 선행연구[10]에서 효과적이었던 성취경험, 타인의 성공담을 통한 자기효능 증진자원을 활용한 것을 근거로 하였다. 복약노트의 구성에 있어서는 의료진과의 의사소통 증진을 위해 미리 질문사항을 메모하고 약물목록을 지참하여 병원에 갈 수 있도록 하는 것이 효과적이었다는 선행연구[11]를 근거로 처방전을 부착할 수 있는 페이지를 별도 구성하고 최근 혈압측정 수치, 약물을 복용한 후 기록하는 체크리스트, 약물 복용 중 부작용 및 질문사항을 작성할 수 있도록 하였다. 또한 노인의 시각적 특성을 고려하여 글자크기 16포인트 이상[8]으로 제작하였다. 개별상담은 약물치료 이행을 저해하는 고혈압 약물 부작용과 특이사항을 관리할 수 있도록 하는 내용으로 구성하였고, 일관성과 전문성을 확보하기 위해 상담 매뉴얼을 제작하였다.

Table 1. Integrated Medication Management Program

Session	Topic	Content	Time (minute)	Method

1	Understanding hypertension	1. Individual counseling in early phase
		  –Check the current phenomenon of taking medication and difficulties
		  –Hand out a medication note and guide how to use
			20	Face-to-face

		2. Face-to-face medication education session
		  –Orientation: introduction of purpose and contents of program
		  –Causes, diagnoses, complications, and management about hypertension
		  –Learn how to take video class
		  –Summary of lesson and Introduction of the next session
			30	Group lecture

		3. Video medication education session
		  –Watch the training video uploaded in YouTube
		  : Iterative learning about face-to-face medication session
			10	Video

2	Understanding hypertension	1. Face-to-face medication education session
		  –Importance of medication for hypertension
		  –Types of hypertension medicines
		  –Side effects of hypertension medicines and interactions
		  –The right use of hypertension medicines
		  –Discussion and Q&A sessions
		  –Reinforce to use the medication note
		  –Introduction of the next session
			30	Group lecture

		2. Video medication education session
		  –Watch the training video uploaded in YouTube
		  : Iterative learning about face-to-face medication session
			10	Video

		3. Telephone counseling
		  –Checking of watching video training
		  –Reaffirmation of contents about face-to-face medication session
		  –Checking for medication use, side effects and difficulties of medication
		  –Consultation on questionable content
		  –Support and encouragement for the continuing medication use
			10	Telephone

3	Enhancing communication with medical staff	1. Face-to-face medication education session
		  –Importance of communication with medical staffs
		  –Who should we communicate with?
		  –Communication contents with medical staffs
		  –How to communicate with medical staffs
		  –Reinforce to use a medication note
		  –Summary of medication management program
		  –Closing
			30	Group lecture

		2. Video medication education session
		  –Watch the training video uploaded in YouTube
		  : Iterative learning about face-to-face medication session
			10	Video

		3. Telephone counseling
		  –Checking of watching video training
		  –Reaffirmation of contents about face-to-face medication session
		  –Checking for medication use, side effects and difficulties of medication
		  –Consultation on questionable content
		  –Support and encouragement for the continuing medication use
			10	Telephone

(4) 수행

본 프로그램을 진행하기 전, 프로그램에서 활용할 강의록, 복약노트, 동영상 제작 기획안 등을 간호대학 교수 1인, 노인복지관 간호사 1인, 약사 1인, 총 3인의 전문가 집단에게 자문을 받아 프로그램을 수정·보완하였다. 위 과정을 토대로 수정한 프로그램을 가상 구현해본 결과 노인인 대상자 특성상, 문자로 발송한 유튜브 링크를 통해 동영상 교육을 시청하는 것에 어려움을 느낄 수 있어 이에 대한 안내를 실습시간에 포함하는 것으로 프로그램을 수정하였다. 동영상 시청 안내로 인해 프로그램 시간에 피로도를 느낄 수 있어 프로그램 시간은 10분 줄이는 것으로 재차 수정하였다. 또한 복약노트에 현재 복약중인 약물을 대상자가 기재할 때 다양한 어려움을 느낄 수 있어 처방전이나 약봉투를 붙여서 현재 복용중인 약물을 파악할 수 있도록 하였다.

(5) 평가

통합 복약관리 프로그램의 가상 구현 이후 수정·보완된 최종안에 대해 고혈압을 진단받은 노인 2인에게 의견을 수렴하였고, 간호대학 교수 1인, 노인복지관 간호사 1인, 약사 1인, 총 3인의 전문가에게 프로그램에 대해 최종 자문을 받은 이후 대상자에게 적용할 자료를 제작하였다.

2) 프로그램 적용

본 프로그램은 복약교육(대면, 동영상)과 개별상담 및 복약노트를 활용하여 주 1회, 총 3주간 진행되었다. 복약교육에 앞서 개별상담을 10분씩 진행하였으며, 이때 대상자의 복약과 관련한 상황과 어려움을 확인한 후 복약노트를 배부하여 활용할 수 있도록 지지하였다. 대면방식의 복약교육은 회당 30분간 시행하였으며, 다음 날 동일한 주제의 10분 길이의 동영상을 개별 참여자에게 문자로 전송한 후 전화상담을 진행했다. 전화상담의 내용은 동영상 시청에 어려움은 없었는지, 복약은 하였는지, 복약과 관련한 어려움은 없는지, 이전 학습내용에 대한 상기 등이었다. 단 첫 주의 경우는 대면 개별상담을 진행하였기에 별도의 전화상담은 진행하지 않았으며, 동영상 시청에 어려움이 있는 경우 연구자에게 연락할 수 있도록 문자안내하였다.

5. 자료수집

본 연구의 자료수집 기간은 2022년 3월부터 4월까지 약 두 달간 시행되었으며 사전조사, 프로그램 적용, 사후조사 1차, 사후조사 2차 순으로 진행되었다. 본 프로그램을 시작하기 전에 사전조사로 일반적 사항(12문항), 의료진과의 의사소통 자신감(5문항), 고혈압 지식(18문항), 복약자기효능감(13문항), 고혈압 약물치료 이행도(8문항)의 총 56문항으로 구성된 설문지를 통해 시행하였다. 프로그램 중재

는 3주간 적용하였으며, 종료 후에 사전조사 1차로 실험군 및 대조군 모두 사전조사에서 일반적 특성을 제외한 내용의 설문지를 동일하게 시행하였다. 효과의 지속성 확인을 위해 진행한 사후조사 2차는 내부행사로 탈락률이 낮을 것이라 예상되는 사후조사 1차가 종료된 2주 후에 측정하였으며 사후조사 1차와 동일한 방법으로 자료를 수집하였다. 연구자가 1:1 면담을 통해 설문지 작성을 안내하였으며, 대면상담을 진행하였던 장소에서 실시하였다.

6. 자료 분석

수집된 자료는 IBM SPSS/WIN 22.0 프로그램(IBM Corp.)을 이용하여 통계분석을 시행하였다.

실험군과 대조군의 일반적 특성은 실수와 백분율, 평균과 표준편차로 산출하였으며 정규성 검정은 Shapiro-Wilk로 분석하였다.

실험군과 대조군의 일반적 특성에 대한 동질성 검증을 위해 χ^2-test, Fisher's exact test, Independent t-test를 실시하였다.

실험군과 대조군의 종속변수에 대한 동질성 검증을 위해 정규성을 충족한 고혈압 지식은 Independent t-test, 정규성을 충족하지 않았던 의료진과의 의사소통 자신감, 복약자기효능감, 고혈압 약물치료 이행도는 Mann-Whitney U-test를 실시하였다.

실험군과 대조군의 종속변수에 대한 시점별, 그룹 간 효과평가는 고혈압 약물치료 이행도가 동질성을 충족하지 않았고, 모든 변수가 정규성을 충족하지 않아 일반화 추정방정식(generalized estimate equation)으로 검정하였다.

7. 윤리적 고려

본 연구는 이화여자대학교 생명윤리위원회(IRB)의 승인(ewha-202301-0018-01)을 받은 후 시행되었다. 연구대상자에게 연구의 목적과 방법, 실험군과 대조군 배정에 대한 설명을 하고 동의서에 서면으로 동의를 받았다. 익명성 보장과 면담 내용은 연구목적 이외에 사용되지 않을 것을 설명하였고 연구 설명문에 대상자의 권리를 공식화하여 동의권자의 의사를 최대한 반영할 수 있도록 하였다. 대상자가 노인임을 고려하여 동의서는 11~14포인트로 작성되었으며 시력 저하로 인해 동의서를 확인하기 어려운 경우 돋보기를 준비하여 충분히 동의서 내용을 검토할 수 있도록 지원하였다. 또한 연구 과정 중 참여를 원하지 않을 경우에는 언제든지 불이익 없이 중단할 수 있음에 대해서 설명하고 문의사항이 있을 경우 연락할 수 있는 연락처를 알려주었다. 프로그램에 참여하지 않은 대조군에게는 실험군과 동일한 복약노트를 제공하고 3회의 교육을 시행하였다.

연구결과

1. 실험군과 대조군의 동질성 검사

본 연구에 참여한 실험군과 대조군은 성별, 연령, 최종학력, 혼인 상태, 평균 월수입, 복용 약물개수, 약물 처방 의사 수, 부작용 경험, 고혈압을 진단받은 기간에서 통계적으로 유의미한 차이가 나타나지 않아 실험군과 대조군의 일반적 특성에 대한 동질성이 검정되었다(Table 2).

교육 전 실험군과 대조군은 고혈압 지식, 복약자기효능감, 의료진과의 의사소통 자신감에서 유의한 차이가 없이 동질하였으나 고혈압 약물치료 이행도에서는 집단 간에 통계적으로 유의한 차이가 확인되었다(Z = −3.39, $p \leq$ .001) (Table 3).

2. 가설검정

1) 제1 가설

'노인복지관 중심 통합 복약관리 프로그램에 참여한 실험군은 프로그램에 참여하지 않은 대조군에 비해 고혈압 지식 점수가 높을 것이다.'는 지지되었다.

일반화 추정방정식을 시행한 결과 실험군과 대조군 간 고혈압 지식 점수에 통계적으로 유의한 차이가 있었으며(χ^2 = 6.89, p = .009), 시간의 흐름에 따라 사전과 사후검사 1차, 2차에서도 고혈압 지식 점수의 유의한 차이가 있었다(χ^2 = .96, p = .002). 또한 집단과 시점의 교호작용 결과 통계적으로 유의한 차이가 있는 것으로 나타났다(χ^2 = 26.43, $p <$ .001). 세부적으로 살펴보면, 실험군의 고혈압 지식은 사전검사 23.37점에서 사후검사 1차에서 27.03점, 사후검사 2차에서 30.82점으로 점차적으로 증가하였으며 대조군은 사전검사

Table 2. General Characteristics of Participants and Homogeneity Test Between Groups (*N*=57)

Characteristic	Category	Overall (*n*=57)	Exp. (*n*=29)	Cont. (*n*=28)	χ^2 or t	*p*-value
Sex	Male	31 (54.4)	13 (44.8)	18 (64.3)	2.17	.186
	Female	26 (45.6)	16 (55.2)	10 (35.7)		
Age (year)*	65~69	2 (3.5)	1 (3.4)	1 (3.6)	0.41	.890
	70~79	21 (36.8)	10 (34.5)	11 (39.3)		
	≥80	34 (59.6)	18 (62.1)	16 (57.1)		
Education*	≤Elementary school	15 (26.3)	10 (34.5)	5 (17.9)	5.71	.117
	Middle school	6 (10.5)	4 (13.8)	2 (7.1)		
	High school	29 (50.9)	14 (48.3)	15 (53.6)		
	≥College education	7 (12.3)	1 (3.4)	6 (21.4)		
Marital status*	Married	25 (43.9)	10 (34.5)	15 (53.6)	2.49	.302
	Not married or divorce	8 (14.0)	4 (13.8)	4 (14.3)		
	Bereaved	24 (42.1)	15 (51.7)	9 (32.1)		
Average monthly income (Korean won)*	≤100	33 (57.9)	19 (65.5)	14 (50.0)	2.55	.677
	101~200	12 (21.1)	5 (17.2)	7 (25.0)		
	201~300	6 (10.5)	2 (6.9)	4 (14.3)		
	≥301	3 (5.3)	2 (6.9)	1 (3.6)		
	Unknowingness	3 (5.3)	1 (3.4)	2 (7.1)		
Number of medications*	1	7 (12.3)	3 (10.3)	4 (14.3)	0.92	.974
	2	13 (22.8)	6 (20.7)	7 (25.0)		
	3	8 (14.0)	4 (13.8)	4 (14.3)		
	4	3 (5.3)	2 (6.9)	1 (3.6)		
	≥5	26 (45.6)	14 (48.3)	12 (42.9)		
Number of doctors prescribing drugs*	1	30 (52.6)	14 (48.3)	16 (57.1)	1.31	.922
	2	14 (24.6)	7 (24.1)	7 (25.0)		
	3	8 (14.0)	5 (17.2)	3 (10.7)		
	4	2 (3.5)	1 (3.4)	1 (3.6)		
	≥5	3 (5.3)	2 (6.9)	1 (3.6)		
Experience of drug side effects	Yes	21 (36.8)	10 (34.5)	11 (39.3)	0.14	.707
	No	36 (63.2)	19 (65.5)	17 (60.7)		
Period of hypertention diagnosised (year)		14.11±10.42	15.24±9.90	12.93±10.99	0.83	.407

Values are presented as *n* (%) or mean±standard deviation. *Fisher's exact result; Cont.=Control group; Exp.=Experimental group.

Table 3. Homogeneity Test of Dependent Variables Between Group (*N*=57)

Variable	Overall (*n*=57)	Exp. (*n*=29)	Cont. (*n*=28)	t/Z	*p*-value
Knowledge of hypertension	23.75±4.67	23.37±4.27	24.14±5.10	-0.61	.543
Self-efficacy for appropriate medication	31.08±5.51	30.27±4.80	31.92±6.13	-0.32	.747
Confidence in communication with medical staff	15.50±3.10	11.86±3.11	13.17±3.00	-1.90	.057
Medication adherence	10.78±2.47	11.51±1.63	10.03±2.96	-3.39	<.001

Values are presented as mean±standard deviation. Cont.=Control group; Exp.=Experimental group.

Table 4. Effects of Medication Education on Dependent Variables

Variable	Knowledge of hypertension		Self-efficacy for appropriate medication		Confidence in communication with medical staff		Medication adherence	
	Exp. (*n*=29)	Cont. (*n*=28)	Exp. (*n*=29)	Cont. (*n*=28)	Exp. (*n*=29)	Cont. (*n*=28)	Exp. (*n*=29)	Cont. (*n*=28)
Pre-test	23.37±4.27	24.14±5.10	30.27±4.80	31.92±6.13	11.86±3.11	13.17±3.00	-	-
Post-test 1	27.03±4.73	25.07±4.53	33.86±5.20	34.46±4.93	13.82±2.13	14.10±1.68	10.10±2.41	9.71±1.94
Post-test 2	30.82±4.48	24.17±4.61	34.86±3.97	33.75±6.40	13.89±2.09	13.96±2.50	10.75±3.65	9.14±2.44
Group	6.89 (.009)		2.93 (.086)		3.28 (.070)		3.11 (.078)	
Time	0.96 (.002)		3.36 (.067)		2.01 (.156)		2.05 (.152)	
Group*Time	26.43 (<.001)		4.06 (.044)		2.77 (.096)		3.65 (.056)	

Values are presented as mean±standard deviation or χ^2 (*p*-value). Cont.=Control group; Exp.=Experimental group.

24.14점에서 사후검사 1차에서 25.07점으로 증가한 후 사후검사 2차에서 24.17점으로 감소하였다(Table 4).

2) 제2 가설

'노인복지관 중심 통합 복약관리 프로그램에 참여한 실험군은 프로그램에 참여하지 않은 대조군에 비해 복약자기효능감 점수가 높을 것이다.'는 지지되었다.

복약자기효능감 점수는 실험군과 대조군 간 통계적으로 유의한 차이가 없었고(χ^2=2.93, *p*=.086), 시간의 흐름에 따라 사전검사와 사후검사 1차, 2차 측정에서도 통계적으로 유의한 차이가 없었다(χ^2=3.36, *p*=.067). 그러나 집단과 시점의 교호작용 결과 통계적으로 유의한 것으로 확인되어(χ^2=4.06, *p*=.044), 제2 가설은 지지되었다. 복약자기효능감 점수에 대해 세부적으로 살펴보면 실험군은 사전검사에서 30.27점, 사후검사 1차에서 33.86점, 사후검사 2차에서 34.86점으로 점차적으로 증가하였고, 대조군은 사전검사에서 31.92점, 사후검사 1차에서 34.46점으로 증가하였다가 사후검사 2차에서 33.75점으로 감소하였다(Table 4).

3) 제3 가설

'노인복지관 중심 통합 복약관리 프로그램에 참여한 실험군은 프로그램에 참여하지 않은 대조군에 비해 의료진과의 의사소통 자신감 점수가 높을 것이다.'는 기각되었다.

의료진과의 의사소통 자신감은 실험군과 대조군 간 통계적으로 유의한 차이가 없었고(χ^2=3.28, *p*=.070), 시간의 흐름에 따라 사전검사와 사후검사 1차, 2차 측정에서도 통계적으로 유의한 차이가 없

는 것으로 나타났으며(χ^2=2.01, *p*=.156), 실험군과 대조군 간 시간의 흐름에 따른 차이가 있는지 검정하였던 집단과 시점의 교호작용 결과 또한 통계적으로 유의하지 않았다(χ^2=2.77, *p*=.096) (Table 4).

4) 제4 가설

'노인복지관 중심 통합 복약관리 프로그램에 참여한 실험군은 프로그램에 참여하지 않은 대조군에 비해 고혈압 약물치료 이행도 점수가 낮을 것이다.'는 기각되었다.

사전 동질성 검사에서 고혈압 약물치료 이행도 점수는 동질성이 확보되지 않아 사전검사를 통제하여 사후검사 1차, 2차에 대해 일반화 추정방정식을 시행하였다. 고혈압 약물 이행도는 실험군과 대조군 간에 통계적으로 유의한 차이가 없었고(χ^2=3.11, *p*=.078), 시간의 흐름에 따라 사후검사 1차, 2차 측정에서도 통계적으로 유의한 차이가 없는 것으로 확인되었다(χ^2=2.05, *p*=.152). 또한 집단과 시점의 교호작용 결과 역시 통계적으로 유의하지 않았다(χ^2=3.65, *p*=.056) (Table 4).

논의

본 연구는 고혈압 노인에게 노인복지관 중심 통합 복약관리 프로그램을 개발 후 적용하고 그 효과를 확인하고자 시도되었다. 프로그램은 복약교육(대면, 동영상)과 대면과 전화를 통한 개별상담 및 복약노트를 활용으로 구성되었으며, 고혈압 지식, 복약자기효능감 및 의료진과의 의사소통 자신감을 증진하여 고혈압 약물치료 이행도를 높이고자 하였다. 개발된 프로그램 중재를 통해 실험군의 고혈압 지

식과 복약자기효능감이 프로그램에 참여하지 않은 대조군보다 유의하게 향상된 것으로 나타났다. 이러한 연구결과를 토대로 통합 복약관리 프로그램의 효과에 대해 논의하고자 한다.

연구결과 고혈압 지식 점수는 실험군과 대조군의 집단 간 유의한 차이가 있었으며 시간의 흐름에 따라 사전과 사후검사 1차, 2차에서 유의한 차이가 확인되었다. 또한 실험군과 대조군 간에 시간의 흐름에 따른 차이가 통계적으로 유의했다. 실험군의 경우 사전검사, 사후검사 1차, 사후검사 2차 세 시점 모두 시간이 지날수록 점수가 유의하게 높아 교육의 효과가 지속되었음을 확인하였다. 이는 보건진료소에 등록된 본태성 고혈압 대상자 120명을 대상으로 4회의 집단교육과 1회의 개별교육을 실시한 선행연구[26]에서 프로그램에 참여하지 않은 대조군과 비교했을 때 실험군의 고혈압 지식에 효과가 있었다는 결과와 일치한다. 본 연구에서는 사후 지속성에 대한 검증이 함께 이루어졌다는 점에서 또 다른 의미가 있었다. 이는 복약교육에 있어 대면방식과 동영상 제공을 병행하였기 때문인 것으로 판단되며, 본 연구에서는 고혈압 지식 증진을 위해 대면방식의 복약교육이 종료된 다음 날 동일 주제의 동영상을 시청할 수 있도록 하여 노인 대상자에게 반복적인 학습을 지원하였다. 본 연구처럼 복약프로그램은 아니지만 노인 대상자에게 동영상과 리플릿을 이용하여 낙상예방 교육 프로그램 제공했을 때 노인 입원 환자의 낙상예방 태도가 감소한 선행연구[27]를 미루어 보아 노인 대상자에게 동영상과 대면방식을 접목한 교육은 반복교육을 도와 효과성을 높이는 것으로 사료된다.

복약자기효능감은 집단과 시점의 교호작용 결과 통계적으로 유의한 것으로 확인되었다. 본 프로그램에서 복약자기효능감 증진을 위해 실험군에게 대면 복약교육 시 토의시간을 통해 최근 성공적인 복약관리 경험을 나눌 수 있도록 하고, 개별상담을 통해 언어적 설득 등을 자원으로 활용하였기 때문으로 사료된다. 이는 보건소에 등록된 고혈압 노인 64명에게 성취 경험, 언어적 설득, 타인의 성공담과 같은 효능자원을 활용한 중재를 통해 복약 관련 자기효능감이 증진된 선행연구[10]와 같은 결과로, 자기효능자원을 활용하는 중재는 노인의 복약자기효능감 증진에 효과적인 것으로 생각된다.

의료진과의 의사소통 자신감은 프로그램 중재를 통해 실험군의 사전조사, 사후조사 1차, 사후조사 2차에서 점진적인 점수 증가가 있었으나 통계적으로 유의하지는 않았다. 지역사회에 거주하는 노인들을 대상으로 병원 방문 전 질문사항을 미리 작성할 수 있도록 하고, 복용 약물을 목록화하여 병원 내방 시 지참할 수 있도록 한 것이 의료진과의 의사소통 자신감 증진에 효과적이었다는 선행연구[11]와는 차이가 있었다. 본 연구에서 전체 참여자 중 가장 높은 연령 비율은 80세 이상으로 59.6%를 차지하였으나, 선행연구는 70~79세 비율이 53.1%로 가장 높아 선행연구보다 본 연구에 더 고령의 노인이 참여하였음을 확인할 수 있었다. 노인의 경우 연령이 증가함에 따라 기억력 저하 등과 같은 특성이 나타나며, 본 연구의 실험군 또한 병원에 내방하는 날에 복약노트를 소지하는 것을 잊거나 부담스러워 하

는 경향이 있었다. 따라서 의료진과의 의사소통 자신감 증진을 위한 보조도구로 별도의 복약노트가 아닌 늘 소지하여 다닐 수 있는 스마트폰을 활용하는 등의 방안을 제안하는 바이다.

마지막으로 고혈압 약물치료 이행도는 실험군과 대조군의 동질성에 유의한 차이가 있어, 사후검사 1차와 사후검사 2차만 분석하였으며 그룹 간, 시점 간, 시점에 따른 그룹 간 차이가 유의하지 않았다. 고혈압 노인을 대상으로 대면교육과 개별상담을 제공하여 실험군의 복약순응도가 향상된 선행연구[10]와는 상반되는 결과로, 본 연구와는 크게 두 가지 차이점이 있었다. 먼저 중재기간의 차이로 선행연구[10]에서는 총 8주간 중재를 적용하였으나 본 연구는 3주로 비교적 짧은 기간 진행되었다. 둘째, 선행연구[10]에서는 간호사에 의한 혈압측정이 제공되었으나 본 연구에서는 간호사에 의한 혈압측정을 포함하지 않았다. 이는 고혈압 약물치료 이행도 증진을 위해서는 장기적인 프로그램 적용과 간호사에 의한 혈압측정을 포함하는 직접적인 중재를 통해 의료인의 직접적 지지효과를 높이는 것이 더욱 효과적일 것이라 사료된다. 한편 본 연구는 노인복지관과 어르신취업지원센터 각 1개소에 등록된 대상자를 편의표집하였기에 연구결과를 모든 고혈압 노인으로 일반화하는 것에는 제한점이 있다. 또한 물리적으로 가까운 곳에 위치하고 있는 두 기관의 특성상 실험군과 대조군 사이의 확산과 같은 외생변수를 완전히 배제하는 것은 어렵다.

세계보건기구는 약물 복용 이행에 영향을 미치는 요인으로 5개 요인으로 나누고 여러 요인들의 상호작용에 의해 결정되는 다차원적 현상이라 하였다[28]. 본 연구에서는 질병에 대한 이해, 자기효능감, 약물에 대한 지식 등과 같은 환자 관련 요인과 의료진과의 관계 등의 건강관리 시스템 요인은 일부 고려하였지만 다차원적 요인들을 고려하지 못하였다. 환자 관련 요인에 해당하는 고혈압 지식과 복약자기효능감은 유의한 변화가 있었으나 의료진과의 의사소통 자신감에서 유의한 변화가 확인되지 않았다. 이러한 결과로 인해 건강 행위인 고혈압 약물치료 이행도를 증진하는 것에는 한계가 있었다.

추후 연구에서는 고혈압의 약물치료 이행도를 높이기 위한 중재로 만성질환이 있는 노인의 특성을 고려하여 다양한 요인을 함께 고려하는 것이 필요하겠다.

결론 및 제언

본 연구는 지역사회에 거주하는 고혈압 노인을 대상으로 노인복지관 중심 통합 복약관리 프로그램을 개발하고 적용하여 노인들의 고혈압 지식, 복약자기효능감, 의료진과의 의사소통, 고혈압 약물치료 이행에 미치는 영향을 파악하고자 시도된 비동등성 대조군 전후 실험연구이다. 연구결과 평균 전체 참여자 중 45.6%가 고혈압 약물을 포함하여 5개 이상의 약물을 복용하고 있었으며 본 프로그램에 참여를 통해 고혈압 지식과 복약자기효능감이 유의하게 증가한 것으로 확인되었다. 의료진과의 의사소통, 고혈압 약물치료 이행의 점수를

향상시켰으나 통계적으로 유의하지는 않았다. 해당 결과를 통해 대면 및 동영상 복약교육과 개별상담, 복약노트를 활용을 통합한 복약관리 프로그램이 노인복지관을 이용하는 지역사회 거주 노인들의 고혈압과 관련한 지식과 복약자기효능감을 증진하는 것에 기여할 수 있을 것으로 사료된다.

본 연구결과를 토대로 다음과 같이 제언하고자 한다.

첫째, 본 연구의 대상자는 일개 지역의 노인복지관을 이용하는 노인들을 편의표집을 하여 진행하였으므로 다수의 노인을 대상으로 무작위 추출 설계를 통한 반복 연구가 필요함을 제언한다.

둘째, 노인의 특성과 다양한 복약 이행요인을 고려한 중재 연구를 제언한다.

셋째, 노인복지관 간호사에 의한 약물관리 프로그램 효과를 검증하는 반복연구를 제언한다.

마지막으로 노인복지관 간호사들을 위한 약물관리 중재 지침의 개발을 제언하는 바이다.

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Authors' contribution

Study conception and design acquisition - HM and DJ; Data collection - HM; Analysis and interpretation of the data - HM and DJ; Drafting and critical revision of the manuscript - HM and DJ

Conflict of interest

Dukyoo Jung has been editor-in-chief of the Journal of Korean Gerontological Nursing since January 2021. She was not involved in the review process of this manuscript. Otherwise, there was no existing or potential conflict of interest relevant to this article was reported.

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Data availability

Please contact the corresponding author for data availability.

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REFERENCES

1. The Korean Society of Hypertension (KSH) Hypertension Epidemiology Research Working Group. Korea Hypertension Fact Sheet 2021. Clinical hypertension [Internet]. KSH; 2021 Dec 13 [cited 2023 May 25]. Available from: http://www.koreanhypertension.org/reference/guide?mode=read&idno=4581

2. Korean Statistical Information Service. Trends in the prevalence of hypertension 2021 [Internet]. Statistics Korea; 2023 Mar 20 [cited 2023 Jul 10]. Available from: https://kosis.kr/statHtml/statHtml.do?orgId=177&tblId=DT_11702_N105&vw_cd=MT_ZTITLE&list_id=&scrId=&seqNo=&lang_mode=ko&obj_var_id=&itm_id=&conn_path=E1&docId=01482&markType=S&itmNm=%EC%A0%84%EA%B5%AD

3. Thomopoulos C, Parati G, Zanchetti A. Effects of blood pressure lowering on outcome incidence in hypertension: 7. Effects of more vs. less intensive blood pressure lowering and different achieved blood pressure levels - updated overview and meta-analyses of randomized trials. Journal of Hypertension. 2016;34(4):613-22. https://doi.org/10.1097/HJH.0000000000000881

4. DiMatteo MR, Giordani PJ, Lepper HS, Croghan TW. Patient adherence and medical treatment outcomes: a meta-analysis. Medical Care. 2002;40(9):794-811. https://doi.org/10.1097/00005650-200209000-00009

5. Bae SG, Jeon HJ, Yang HS, Kim BK, Park KS. Medication adherence and its predictors in community elderly patients with hypertension. Korean Journal of Health Promotion. 2015;15(3):121-8. http://doi.org/10.15384/kjhp.2015.15.3.121

6. Park SH. Diagnosis and treatment of senile hypertension [Internet]. The Korean Association of Internal Medicine

Autumn Academic Presentation; 2012 [cited 2023 Jun 5]. Available from: https://www.ekjm.org/upload/42847552.pdf

7. Lee JK. Factors associated with drug misuse behaviors among polypharmacy elderly. Korean Journal of Adult Nursing. 2011;23(6):554-63.

8. Park YI, Lee KY, Kim DO, Uhm DC, Kim JH. Medication status and the effects of a medication management education program for the elderly in a community. Journal of Korean Academy of Community Health Nursing. 2014;25(3):170-9. https://doi.org/10.12799/jkachn.2014.25.3.170

9. Hope CJ, Wu J, Tu W, Young J, Murray MD. Association of medication adherence, knowledge, and skills with emergency department visits by adults 50 years or older with congestive heart failure. American Journal of Health-System Pharmacy. 2004;61(19):2043-9. https://doi.org/10.1093/ajhp/61.19.2043

10. Kim HJ, Song M. Effects of a medication adherence improvement program utilizing self-efficacy resources for older adults with hypertension. Journal of Korean Gerontological Nursing. 2013;15(2):131-42.

11. Lee JK. Evaluation of a medication self-management education program for elders with hypertension living in the community. Journal of Korean Academy of Nursing. 2013;43(2):267-75. https://doi.org/10.4040/jkan.2013.43.2.267

12. Kerzman H, Baron-Epel O, Toren O. What do discharged patients know about their medication? Patient Education and Counseling. 2005;56(3):276-82. https://doi.org/10.1016/j.pec.2004.02.019

13. Kang SH, Ko E. Factors associated with medication adherence among the elderly with chronic diseases. Korean Journal of Adult Nursing. 2021;33(2):189-201. https://doi.org/10.7475/kjan.2021.33.2.189

14. Kim MS, Kim YO. A convergence factors associated with medication adherence among the elderly in the community. Journal of the Korea Convergence Society. 2021;12(12):125-37. https://doi.org/10.15207/JKCS.2021.12.12.125

15. Ministry of Health and Welfare. Current status of welfare facilities for the elderly 2023 [Internet]. Ministry of Health and Welfare; 2023 Jun 30 [updated Jul 17; cited 2023 Jul 10]. Available from: https://www.mohw.go.kr/react/jb/sjb030301vw.jsp

16. Kim HJ, Kim KH. Effects of image-use medication education on knowledge, self-efficacy, and misuse of medication in elderly inpatients. Journal of Korean Clinical Nursing Research. 2018;24(1):56-66. https://doi.org/10.22650/JKCNR.2018.24.1.56

17. Park Y, Hong Y. An effect of the self-regulation program for hypertensives: synthesis & testing of Orem and Bandura's theory. Journal of Korean Community Nursing. 1994;5(2):109-29.

18. Risser J, Jacobson TA, Kripalani S. Development and psychometric evaluation of the Self-efficacy for Appropriate Medication Use Scale (SEAMS) in low-literacy patients with chronic disease. Journal of Nursing Measurement. 2007;15(3):203-19. https://doi.org/10.1891/106137407783095757

19. Park M. Effects of interactive pictorial education on community dwelling older adult's self efficacy and knowledge for safe medication. Journal of Korean Academy of Nursing. 2011;41(6):795-804. https://doi.org/10.4040/jkan.2011.41.6.795

20. Hogan DB, Kwan M. Patient sheet: tips for avoiding problems with polypharmacy. Canadian Medical Association Journal. 2006;175(8):876. https://doi.org/10.1503/cmaj.060888

21. Kim MT, Hill MN, Bone LR, Levine DM. Development and testing of the hill-bone compliance to high blood pressure therapy scale. Progress in Cardiovascular Nursing. 2000;15(3):90-6. https://doi.org/10.1111/j.1751-7117.2000.tb00211.x

22. Song Y, Han HR, Song HJ, Nam S, Nguyen T, Kim MT. Psychometric evaluation of hill-bone medication adherence subscale. Asian Nursing Research. 2011;5(3):183-8. https://doi.org/10.1016/j.anr.2011.09.007

23. The Korean Society of Hypertension (KSH). Hypertension standard slides for the general public 2019 [Internet]. KSH; 2020 Feb 18 [cited 2023 May 25]. Available from: https://www.koreanhypertension.org/reference/guide?mode=read&idno=4361

24. Korea Disease Control and prevention Agency (KDCA). Education guide for hypertension standard education [Internet]. KDCA; 2014 Apr 24 [cited 2023 May 25]. Available from: https://www.kdca.go.kr/filepath/boardSyview.es?bid=0021&list_no=127644&seq=70

25. Kook MJ. A study on the effect and application of motion picture materials in geography subject. The Journal of The Korean Association of Geographic and Environmental Education. 2003;11(3):119-32.

26. Jeong BS, Gang HG, Gwak MY, Kim ES, Kim HY, Bak ES, et al. Effects of biophysical index, knowledge, and self management compliance of patients with primary hypertension by a self management compliance promotion program. Journal of Korean Academy of Nursing. 2006;36(3):551-60.

https://doi.org/10.4040/jkan.2006.36.3.551

27. Kang YO, Song RY. Effects of fall prevention education program on attitudes, prevention behaviors, and satisfaction among elderly inpatients. Korean Journal of Adult Nursing. 2018;30(1):49-59. https://doi.org/10.7475/kjan.2018.30.1.49

28. World Health Organization. Adherence to long-term therapies: evidence for action [Internet]. World Health Organization; 2003 [cited 2023 Jul 7]. Available from: https://apps.who.int/iris/bitstream/handle/10665/42682/9241545992.pdf

만성질환 노인을 돌보는 간호사의 공유적 의사결정 역할 인식: 질적 서술적 연구

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The role of nurses in shared decision-making about caring for older adults with chronic disease: A qualitative descriptive study

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Purpose: The objective of this study was to explore nurses' perception of their roles in shared decision-making about caring for older adults with a chronic disease. **Methods:** This study was a qualitative descriptive study. Ten nurses participated in the focus group interviews. The collected data were analyzed using qualitative content analysis to explore nurses' roles in shared decision-making about caring for older adults with a chronic disease. **Results:** Nurses' shared decision-making experiences about caring for older adults with a chronic disease yielded four main themes and ten categories including 'facilitating involvement in decision-making', 'providing information for decision-making', 'respecting patient values and preferences', 'evaluating the outcome of decision-making'. **Conclusion:** This study explored nurses' roles in shared decision-making about caring for older adults with a chronic disease. Nurses can enhance the shared decision-making process by identifying the decision needs and facilitating decision-making.

Keywords: Decision making, Shared; Nurses; Aged; Chronic disease

서론

1. 연구의 필요성

우리나라 인구 고령화율은 2025년 20.3%, 2050년에는 39.8%로 급속히 증가할 것으로 예상되고 있다[1]. 2020년 보건복지부의 노인 실태조사[2]에 따르면 65세 이상 노인의 84%가 1개 이상의 만성질환이 있으며 만성질환을 2개 이상 가지고 있는 복합이환 노인은 54.9%로 나타났다. 이와 같이 대부분의 노인이 만성질환을 가지고 있으며 만성질환으로 인해 경험하는 건강 변화와 삶의 질에 대한 다양한 의사결정에 직면하게 된다. 노인의 건강관리와 관련된 의사결정에서 건강문해력이 낮거나 의사소통 장애가 있는 노인의 경우 대상자의 가치와 선호도를 충분히 반영하지 못한 의사결정이 내려질 가능성이 높아진다[3-5]. 또한 만성질환이 있는 노인의 경우 신체적, 기능적 독립성과 인지기능의 저하 등으로 인해 자신의 건강관리를 위한 의사결정에 참여하는 것이 더욱 어려워진다[6].

공유적 의사결정(shared decision-making)은 치료에 대한 결정을 내려야 할 때 의료진은 환자가 이용 가능한 여러 선택지와 해당

근거를 제공하고, 환자가 의료진이 제공한 정보에 입각하여 자신의 가치와 선호도가 포함된 다양한 선택을 하도록 지원하는 접근법이다[7]. 즉, 공유적 의사결정은 최선의 결정을 내리기 위해 의료진과 환자 간의 정보 교환 및 의사소통을 포함하는 협력 과정이다[8]. 미국 의학연구소(Institute Of Medicine)에서는 21세기 의료서비스 질 향상의 여섯 가지 주요 목표 중 하나로 환자와 의료진의 공유적 의사결정을 권고하였으며[9], 세계보건기구(World Health Organization)는 건강과 관련된 의사결정에 대한 개인의 자율성을 보건의료 체계의 핵심지표로 강조하였다[10]. 환자와 의사결정을 공유하는 것은 환자의 자율성을 보장하는 중요한 방법이며 개인의 기본적인 자기결정권을 실천하는 수단이다[3,11].

치료과정에 환자가 적극적으로 참여하는 것은 자신의 건강상태에 대한 인식을 높여 치료에 대한 책임감과 통제력을 높이고, 환자 본인의 선호도 및 가치와 일치하는 치료를 선택하는 데 도움이 된다[12]. 환자 참여는 건강행동 변화와 더불어 만성질환과 관련된 합병증의 위험을 줄이기 위한 예방 전략에도 긍정적인 영향을 미치며[13], 의료진과 환자 간의 공유된 의사결정 과정을 통해 환자의 선호도를 포함하여 목표를 설정하는 것은 만성질환이 있는 환자의 자가관리 이행도를 높인다[12]. 의사결정을 공유하는 것은 치료에 대한 환자 중심성을 향상시켜 의존적 관계에 노출되기 쉬운 환자에게 긍정적인 치료 경험을 가져올 수 있다[5].

만성질환의 유병과 합병증 발생에 취약한 노인은 건강과 관련된 의사결정에 있어서도 본인의 감정, 이전의 경험 및 가치에 더 많이 의존하는 경향이 있다[5]. 노인에게 중요한 건강 결과는 기능적 상태, 독립성, 일상생활을 수행할 수 있도록 증상을 잘 조절하는 것이다[13]. 따라서 만성질환을 가진 노인환자의 건강관리를 위한 결정에서 일상생활에서의 독립성과 삶의 가치가 우선순위가 되어야 하며, 어떤 우선순위와 동기가 건강과 관련한 의사결정을 하는 데 있어 중요하게 작용하는지 알아내야 한다[14].

환자는 간호사와 긴밀하고 빈번한 접촉을 하므로 의사와 공유하지 않은 개인적 가치와 선호도에 대한 정보를 더 많이 공유하는 경우가 많다[15]. 선행연구에 따르면 간호사는 의료적 의사결정 과정에서 환자에게 시의적절하고 신뢰할 수 있는 정보를 제공하고 환자와 그 가족이 가질 수 있는 우려 사항을 명확히 파악하는 옹호자 역할을 한다[16]. 간호사는 공유적 의사결정 과정에 환자를 포함시키려는 노력을 통해 환자의 관점에 대한 의료진의 이해를 넓힐 수 있다. 또한 의사가 환자에게 제공한 정보를 환자가 더 잘 이해할 수 있도록 자세히 설명하고 환자와 가족에게 정서적 지원을 제공하는 보완적, 촉진적 또는 지원적 역할을 담당할 수 있다[17]. 공유적 의사결정 과정에서 간호사의 참여는 환자의 가치와 선호도에 더 부합하는 결정으로 이어질 수 있으며, 이는 환자와 가족 모두의 삶의 질을 향상시킬 수 있다[17].

따라서 노인환자의 개별적 선호도와 요구, 가치에 부합하는 인간

중심 돌봄을 제공하기 위해서는 공유적 의사결정이 이루어져야 하며, 공유적 의사결정 과정에 있어 간호사의 역할이 파악되어야 할 필요가 있다[12]. 하지만 국내에서는 공유적 의사결정 과정에서 간호사의 역할에 대한 연구가 이루어진 바 없으며, 국외에서는 연명치료[17,18], 암환자[9,14,15], 류마티스관절염 환자[19] 등 특정 상황에서 간호사의 공유적 의사결정 역할에 대한 연구가 이루어졌다. 기존 연구를 종합해 볼때 만성질환 노인을 돌보는 간호사들이 공유적 의사결정을 어떻게 경험하고 있으며 어떤 역할을 수행하고 있는지에 대한 연구는 부족한 실정이다.

이에 따라 공유적 의사결정에 있어 만성질환 노인을 돌보는 간호사의 역할을 정확히 이해할 필요가 있으며 이를 위해서는 현장에서의 경험을 기술하고 그 현상을 규명할 수 있는 질적 연구방법이 적합하다. 초점집단면접(focus group interview, FGI)은 참여자들의 상호작용을 활용하여 비교적 짧은 시간 동안 여러 참가자들의 생각과 경험을 파악할 수 있는 집단면접 방법으로[20] 탐색과 발견, 상황에 대한 깊이 있는 전후 맥락적 이해를 바탕으로 공유적 의사결정에서 간호사의 역할 경험을 도출하는 데 유용한 질적연구방법이다. 이에 본 연구에서는 FGI를 통해 만성질환 노인을 돌보는 간호사가 경험한 공유적 의사결정 과정에서의 간호사의 역할에 대한 인식을 파악함으로써 만성질환 노인간호에 있어 공유적 의사결정을 효과적으로 촉진하고 교육할 수 있는 기초자료로 제시하고자 한다.

2. 연구목적

본 연구의 목적은 간호사를 대상으로 만성질환 노인의 간호와 관련된 공유적 의사결정에 있어 간호사의 역할에 대한 인식을 파악하는 데 있다.

연구방법

1. 연구설계

본 연구는 만성질환 노인을 돌보는 간호사를 대상으로 공유적 의사결정 과정에서 경험한 간호사의 역할을 탐색하기 위해 FGI를 시행하고 수집된 면담 내용을 분석하는 질적 서술적 연구(qualitative descriptive study)이다.

2. 연구참여자

본 연구참여자는 종합병원 및 병원에서 근무하며 임상경력이 1년 이상인 간호사로 만성질환 노인을 간호한 경험이 있는 자를 대상으로 목적적 편의추출(purposeful sampling)하였다. 대전광역시 상급종합병원 및 종합병원에서 근무하는 간호사 중 본 연구의 목적과 방법을 이해하고 만성질환 노인을 돌본 경험이 있으며 공유적 의사결정에 대해 진술하고 풍부한 이야기를 해줄 수 있는 자를 눈덩이 굴리기 방법(snowball sampling)을 사용하여 10명을 모집하였다.

3. 자료수집

본 연구의 자료수집은 2022년 10월 31일부터 11월 11일까지 시행되었으며 연구참여자의 경험을 자유롭게 이야기할 수 있도록 반구조화 질문을 이용하여 FGI를 진행하였다. 동질성 확보와 분할 전략[20]에 따라 집단의 동질성을 유지하면서 집단간 차이를 통해 서로 다른 시각과 견해를 얻을 수 있도록 상급종합병원 4명, 종합병원 6명으로 2그룹으로 구성하였다. 집단의 크기는 실용적, 현실적 측면을 고려할 때, 경험적으로 6~10명 정도의 크기가 적당한 것으로 알려져 있어[20], 이를 고려하였다. 연구참여자의 일반적인 정보로 나이, 성별, 결혼 유무, 교육정도, 근무부서, 근무병원의 병상 수, 총 임상경력, 현재 부서에서의 임상경력에 대한 정보를 확인하였다. 면담 시간은 회당 90~120분간 진행되었다. 연구참여자의 동의하에 면담 내용을 녹음하고 면담 직후 필사를 시행하였다.

공유적 의사결정에 대한 용어가 익숙치 않은 개념이므로 참여자 모집 시 공유적 의사결정에 대한 이해정도를 확인하고 해당 용어의 정의와 임상에서의 사례에 대해 면담일정과 함께 미리 알려주었다. 주요 면담 질문은 '공유적 의사결정에서 간호사로서 경험은 어떤 것이 있나요?', '공유적 의사결정을 실천하기 위해 무엇이 필요하다고 생각하나요?', '공유적 의사결정에 방해가 되는 요인은 무엇이라고 생각하나요?', '주로 어떤 상황에서 공유적 의사결정이 필요하다고 생각하나요?', '공유적 의사결정에서 간호사의 역할은 무엇이라고 생각하시나요?'로 구성하였다. FGI 말미에는 인도자와 보조자가 면담 중 중요하다고 생각한 진술이나 요약에 대한 현장노트를 발표함으로써 참여자의 말을 적절히 이해하였는가를 확인하였다. 면담은 각 참여자로부터 준비된 면담 질문의 내용에 대한 새로운 진술이 더 이상 나오지 않는다고 생각되는 시점까지 진행되었다. 참여자들이 제약을 받지 않고 자유롭게 이야기할 수 있도록 하며, 어느 한 참여자에게만 편중되지 않고 모든 참여자가 빠짐없이 참여할 수 있도록 하였다. 두 그룹의 면담내용을 취합하여 녹취된 내용과 필사본을 확인하는 과정에서 발견된 부족한 점에 대하여는 개별 연락을 통해 비대면 면담을 진행하였다.

4. 자료분석

본 연구의 자료분석은 Elo와 Kyngäs [21]가 제시한 내용분석 과정 중 귀납적 접근을 이용하여 시행하였다. 귀납적 접근법은 일반적인 것은 구체적인 것에서부터 시작되며 특정 사례가 발견된다면 일반적이고 포괄적인 상황으로 통합되는 것으로, Elo와 Kyngäs [21]은 해당 상황에 대해 사전 지식이 풍부하지 않고 익숙지 않은 새로운 주제를 다룬다면 귀납적 방법을 이용하여 내용분석을 할 것을 제시하였다[22].

첫 번째 준비과정에서 연구자들은 각자 기록한 메모 내용을 서로 비교하며 면담에서 나타난 주요 주제와 내용을 검토하였다. 연구자들은 녹음된 면담 내용을 반복적으로 듣고 필사한 서술적 자료를 반복하여 읽으면서 전체적인 내용과 맥락을 파악하며 분석단위를 결정하였다. 두 번째 조직화 과정에서 연구자들은 개방 코딩, 범주 형성, 추상화의 3단계를 수행하였다. 개방 코딩 단계는 연구자 각기 따로 수행하여 추출된 개념들을 서로 비교·검토하였으며, 분석에 이견이 있는 것은 다시 원자료를 확인하는 과정을 거쳐 의견을 통합하였다. 핵심범주와 하위범주의 발견 및 이들을 과정적 도해로 연결하는 작업은 연구자들의 의견 교환과 토론을 거쳐 이루어졌다. 연구자들은 면담 내용이 필사된 자료를 읽으면서 의미 있는 내용에 적합한 제목을 작성하였고, 작성된 제목의 특징을 살피며 그룹화하는 범주 형성 단계를 수행하였다. 조직화 과정의 마지막 단계로 형성된 범주를 살피며 일반적인 주제로 추상화하였다. 세 번째 보고단계에서는 모든 연구자의 의견을 총합하여 도출된 핵심 주제를 보고하였다.

5. 연구의 엄밀성

연구의 엄격성과 진실성 확보는 Lincoln와 Guba [23]가 제시한 신뢰성(credibility), 적용 가능성(applicability), 일관성(consistency), 중립성(neutrality)에 근거하였다. 첫째, 신뢰성을 확보하기 위해 면담 직후 면담 내용의 전체를 필사하였으며, 녹음된 내용을 반복적으로 들어 누락된 자료가 있는지 확인하였다. 또한 면담 시 메모를 통해 면담참여자들의 언어적 의사소통뿐만 아니라 비언어적 의사소통까지 관찰하고 기록하였으며, 기술된 면담의 내용을 연구참여자에게 보여주고 본인의 의도에 맞게 기술되었는지 확인하였다. 둘째, 적용 가능성을 확보하기 위해 만성질환이 있는 노인을 돌보면서 경험한 공유적 의사결정에 대해 풍부한 사례를 말해줄 수 있는 자를 목적적 표집하였으며, 참여자 2명에게 연구결과를 공유하며 주제를 확인하고 공감할 수 있는지 확인하였다. 셋째, 일관성을 확보하기 위해 수집된 자료를 분석할 때 연구자들 간 수차례 토론과 검토과정을 거쳐 일관된 결과를 도출하였다. 연구자는 연구의 전 과정 동안 연구의 주 질문을 지속적으로 생각하면서 자료수집과 분석이 이루어지도록 하였으며, 자료분석 과정에서 질적 연구의 경험이 있는 2인의 간호

학 교수에게 개념과 범주에 대한 피드백을 받는 과정을 거침으로써 자료분석의 일관성을 확보하고자 하였다. 넷째, 중립성을 확보하기 위해 면담 중 참여자의 이야기에 관여하거나 의도적으로 상황을 이끌지 않았다. 또한 자료 분석 중 원자료와 지속적인 비교를 통해 연구자의 편견과 가정을 의식적으로 배제하고 연구참여자가 진술한 내용으로만 분석하려 노력하였다.

6. 윤리적 고려

본 연구는 충남대학교 생명윤리위원회로부터 연구윤리를 검토와 승인받았으며(IRB No: 202007-SB-094-01), 한국연구재단의 지원을 받아 수행되었다. 연구참여자에게 연구목적과 절차, 연구방법 및 면담 내용이 녹취될 것임을 설명하고 연구에 자발적으로 참여하길 원하는 자에 한해서 동의서를 받은 뒤 면담을 진행하였다. 면담은 90~120분 정도 소요될 것이며 면담 시 수집한 자료는 연구목적 이외에 다른 목적으로 사용되지 않을 것임을 연구참여자에게 설명하였다. 또한 연구참여에 따른 이익과 위험은 없을 것으로 예상되고, 연구참여 중 연구참여자가 원하지 않으면 언제든 연구참여를 중단할 수 있으며 이때 수집한 자료는 모두 폐기될 것임을 설명하였다. 연구를 위해 수집한 개인정보는 개인정보보호법에 따라 관리할 것이며 연구에서 얻어진 개인정보가 학회지나 학회에 공개될 수 있으나 참여자를 식별할 수 없도록 고유번호를 부여할 것임을 고지하였다.

본 연구자는 연구참여자를 식별할 수 없도록 고유번호를 부여하였으며 수집된 녹음파일은 연구자만 접근 가능할 수 있는 장소와 비밀번호가 부여된 컴퓨터에 보관하여 연구자 이외의 사람에게 자료가 노출되지 않도록 조치하였다. 연구참여자에게는 연구참여에 대한 소정의 답례로 사례비를 제공하였다.

7. 연구자 준비

본 연구를 위해 연구자는 대학원 박사과정에서 질적 연구방법론을 수강하였다. 평소 만성질환 노인을 돌보는 간호사와 관련된 국내외 문헌을 폭넓게 고찰하고 숙독하였다. 또한 질적연구 관련한 워크숍에 참여하였으며, FGI 과정에 참여하여 면담내용 분석과 범주를 추출하는 방법을 숙지하였다.

연구결과

1. 연구참여자의 일반적 특성

본 연구참여자는 총 10명으로 여자 9명, 남자 1명이었다. 연구참여자의 평균 연령은 31.0세(26~39세)였으며, 교육 상태는 학사 8명, 석사 이상이 2명이었다. 근무부서는 일반병동이 8명, 간호간병통합서비스병동이 2명이었고, 근무하고 있는 병원의 병상 수는 500병상 미만이 6명, 500병상 이상이 4명이었다. 연구참여자의 총 평균 경력은 8.4년(2.9~14.6년), 현재 근무부서의 평균 경력은 3.9년(2.0~9.8년)이었다(Table 1).

2. 공유적 의사결정 과정에서의 간호사의 역할

본 연구에서 만성질환 노인을 돌보는 간호사의 공유적 의사결정 경험을 분석한 결과, 62개의 개방코드가 도출되었으며, 비슷한 코드끼리 분류하여 24개의 하위범주로 통합하였고, 이를 바탕으로 10개의 범주로 구조화되었다. 마지막으로 구조화된 범주의 추상화를 통해 4개의 주제가 도출되었다(Table 2). 도출된 4개의 주제는 '의사결정 참여 촉진', '의사결정을 위한 정보 제공', '환자의 가치 및 선호도

Table 1. General Characteristics (*N*=10)

Group	No.	Age (year)	Sex	Marital status	Education level	Current department	Size of the hospital	Total clinical experience (year)	Current department experience (year)
FG 1	1	26	F	Unmarried	University	General	300 to <500 beds	3.6	3.6
	2	33	F	Married	University	General	100 to <300 beds	11.0	5.0
	3	36	F	Unmarried	University	Comprehensive nursing care	300 to <500 beds	14.6	2.2
	4	39	F	Married	University	General	300 to <500 beds	13.9	3.9
	5	31	F	Married	University	Comprehensive nursing care	300 to <500 beds	9.6	2.1
	6	34	F	Married	Master	General	300 to <500 beds	10.0	3.0
FG 2	7	31	F	Married	Master	General	≥500 beds	9.8	9.8
	8	27	F	Unmarried	University	General	≥500 beds	4.0	2.0
	9	26	M	Unmarried	University	General	≥500 beds	2.9	2.9
	10	27	F	Unmarried	University	General	≥500 beds	4.8	4.8

F=Female; FG=Focus group; M=Male.

Table 2. Perception of Nurses' Role in Shared Decision-Making

Theme	Category
Facilitating involvement in decision-making	Confirming intention for decision-making
	Identifying the decision-maker
	Nuturing collaborative culture
Providing information for decision-making	Ensuring the accuracy of patient and family member's information
	Providing rational for reasonable decision-making
Respecting patient values and preferences	Allowing time for careful consideration to make a decision
	Moderating and Mediating for decision-making
	Understanding patient values and preferences
Evaluating the outcome of decision-making	Confirming changes in the opinions on the determined content
	Accepting changes in decision-making

존중', '의사결정의 결과 평가'이다.

1) 주제 1. 의사결정 참여 촉진

만성질환 노인을 돌보는 간호사의 공유적 의사결정 역할은 노인환자의 의사결정 참여 여부를 확인하는 것이었다. 공유적 의사결정에 간호 대상자를 참여시키는 것은 환자의 자기결정권을 존중하는 것을 의미한다. 간호사는 노인환자에게 의사결정이 필요하다는 것을 알리고, 노인환자의 의사결정 참여 의지를 확인하였다. 간호사는 이 과정에서 의사결정에 노인환자뿐만 아니라 가족과 의료진 등 다양한 주체들이 함께함을 경험하였다. 이에 대한 범주는 '환자의 의사결정에 대한 참여의지 확인'과 '의사결정의 주체와 의사결정 능력 확인', '협력적 문화 조성'이 포함된다.

(1) 환자의 의사결정에 대한 참여의지 확인

간호사는 노인환자와 가족에게 의사결정 참여에 대한 의지를 물음으로써 의사결정 과정이 시작될 수 있도록 도와주는 역할을 담당하였다. 진단받은 만성질환에 대한 정보가 많은 노인환자와 가족은 의사결정 과정에도 적극 참여하고 싶어 하는 것에 반해 만성질환에 대한 정보가 부족한 노인환자와 가족은 의사결정에 참여하기를 주저하거나 의료진이 관련 결정을 내려주길 원하였다.

85세 이상이고 진단받은 질환이 많은 환자가 입원하면 간호정보조사를 하면서 (환자와 가족에게) 원하는 치료 범위 정도를 물어요. (중간 생략) 진단받은 만성질환 관리에 대해 결정이 필요할 때 환자와 가족들이 진단받은 만성질환에 대해 이미 정보를 가지고 있고 관심이 많으면 의사결정에 적극적으로 참여하고 싶어 하시더라구요. (A1)

만성질환이 진행돼서 호스피스 케어가 필요한 환자가 있었는데 그때 환자와 보호자에게 어디까지 치료를 하실 것인지 생각해 보았는지 여쭤어봤어요. (중간 생략) 환자와 보호자 입장에서는 (질병에 대한) 전문적인 지식도 부족하고 처음 겪는 상황(만성질환 관리에 대한

결정)이라 의사가 모든 걸 알아서 결정해주길 원하시는 분도 있어요. (A5)

(2) 의사결정의 주체와 의사결정 능력 확인

간호사는 해당 의사결정에 참여하는 대상이 누구인지를 확인하고 참여가 필요한 대상에게 이를 알리는 역할을 담당하였다. 노인환자를 돌보는 주된 역할을 하고 있는 가족이 노인환자의 건강관련 의사결정에 있어서도 중요한 결정권자가 되거나 의료진이 주도적으로 의사결정을 내리는 경우 간호사는 노인환자의 참여주체로서의 역할을 상기시켰다. 또한 노인환자가 질병으로 인한 기능저하나 의사소통 능력 제한으로 인해 가족 또는 의료진이 의사결정을 내리는 것을 경험한 간호사는 노인의 의사결정 능력을 다시 평가하고 이를 제고하도록 촉진하는 역할을 담당하였다.

환자분이 고령이시다 보면 보통 자식들이 경제권을 가지고 있어 환자의 의사결정에 있어 아무래도 가족의 의견이 가장 큰 것 같아요. 환자분도 가족들이 하자는 대로만 하세요. (중간 생략) 가족이 여러 명일 때는 가족분들에게 누가 의사결정을 내리는 주보호자인지 확인하고 주보호자가 의사결정을 내릴 것인지 가족이 함께 내릴 것인지 여쭈고 환자의 의견과 서명동의도 필요함을 말했어요. (A9)

입원 초기부터 환자와 가족이 DNR (Do not resuscitate, 심폐소생술 금지)을 희망한 상태였는데 무조건 의사가 ICU (intensive care unit, 집중치료실)로 가라고 하니 환자와 아드님은 아무말도 못했어요. 의사가 가라고 하니 가야 되는 상황이었고, 아드님도 아무런 말도 못하고 의사가 가라고 하니 그냥 따라야 한다는 말을 하시더라구요. 아드님께 DNR의 범위와 환자의 치료에 대한 의사를 다시 한번 확인하고 이를 의사에게 전달했어요. (A5)

(3) 협력적 문화 조성

간호사, 환자와 가족을 의사결정에 적극적으로 참여시키는 협력적

인 문화를 조성해야 공유적 의사결정이 촉진된다고 하였다. 노인환자와 가족의 참여에 대한 의료진의 선입견과 편견을 극복하며 공감과 이해를 바탕으로 의사결정에 참여하는 것이 중요함을 경험하였다.

공유적 의사결정이라는 단어 자체가 간호사한테 부담스러운 것 같아요. (중간 생략) 하지만 간호사가 공유적 의사결정이 간호사에게도 필요한 거지만 환자도 필요한 거고, 내가 만약 환자라면 의사결정에 참여하기를 원하지 않았을까 하는 마음과 공유적 의사결정에서 오는 긍정적 영향을 의료진들이 다함께 인지를 해야 되는 것 같아요. (A6)

환자가 모든 걸 알고 있을 거라는 편견이나 인식 개선이 필요할 것 같아요. 이 정도는 말 안 해도 알겠지라는 식으로 대충 설명하고 진행하지만 환자와 가족은 의외로 모르는 게 많으니까 그런 선입견, 편견 같은 걸 바꿀 필요도 있지 않나 싶어요. (A9)

2) 주제 2. 의사결정을 위한 정보 제공

간호사는 노인환자와 가족이 의사결정을 할 수 있도록 정보를 제공하는 역할을 담당하고 있었다. 간호사는 노인환자와 가족이 의사결정을 할 수 있도록 충분한 정보를 제공하고 설명을 하여 노인환자와 가족의 알 권리를 보장하였다. 또한 간호사는 노인환자와 가족이 가지고 있는 정보를 평가하였으며, 과학적 근거를 바탕으로 의사결정을 할 수 있도록 관련 정보를 제공하되 이를 이해할 수 있는 범위로 제공하여 노인환자와 가족이 최선의 선택을 할 수 있도록 도왔다. 관련 범주로 '환자와 가족이 가진 정보의 정확성 확인', '합리적 의사결정을 돕는 정보 제공'이 포함된다.

(1) 환자와 가족이 가진 정보의 정확성 확인

간호사는 노인환자와 가족이 어떠한 경로를 통해 질환에 대한 정보를 얻는지를 확인하였다. 노인환자와 가족이 의료진이 정보를 제공하지 않아도 다양한 매체를 통해 사전에 지식을 얻어 의사결정을 내리기도 하는 것과 가지고 있는 정보가 올바르지 않아 의사결정이 잘못 내려지거나 지연되는 것을 예방해야 함을 경험하였다.

최근에는 매체가 다양해서 환자와 보호자분들이 CPR (cardiopulmonary resuscitation, 심폐소생술)이 뭔지 ICU가 뭔지 의학용어도 많이 알고 계시더라고요. 우선은 고령인 환자가 입원해서 큰 수술을 받게 될 경우에는 사전에 동의서를 받으면서도 그런 것들(사전연명치료) 범위까지도 확인을 받고 동의를 구하다 보니까 보호자분들도 어느 정도 마음의 준비를 먼저 하고 오시는 분들도 많았어요. (A3)

요즘은 인터넷이 많이 발달하니까 정보가 많잖아요. 근데 잘못된 정보를 가지고 '이렇게 치료하는 게 맞냐'라고 하고, 또 병원마다 치료 방법이 다르잖아요. 그러니까 '왜 다른 병원은 이렇게 했는데 이

병원은 왜 다른 방법을 하냐'라고 비교하면서 결정하는 데 있어 지연이 발생하기도 해요. 그러면 어디서 확인한 정보인지 등을 여쭈어보고 병원의 안내서 등을 제공하기도 해요. (A10)

(2) 합리적 의사결정을 돕는 정보 제공

간호사는 자신의 경험을 바탕으로 비슷한 상황에 있는 다른 노인환자들이 어떻게 선택을 내렸는지에 대한 정보를 노인환자와 가족에게 제공하였다. 또한 선택지의 장단점을 함께 설명하여 노인환자와 가족이 최선의 선택을 할 수 있도록 도왔다. 노인환자와 가족이 가진 정보가 잘못된 경우 간호사는 정확하고 신뢰할 수 있는 정보로 대체할 수 있도록 도와 결정이 합리적으로 이루어질 수 있도록 지원하였다.

저희한테 먼저의 경우 (환자와 같은 상황에 놓인) 다른 분들은 어떻게 진행을 했는지 궁금해 하시더라고요. 그럴 때 제가 경험했던 환자들에 대해 말씀을 드리는 편이에요. (A3)

환자와 가족에게 좋고 나쁨에 대해서 지속적으로 설명해줘요. '이렇게 하면 이런 치료 효과가 있지만 이런 단점이 있습니다'에 대해서 끊임없이 얘기해 주는 편이에요. (A1)

보통 복막투석관을 갖고 퇴원하는 분들이 소독법, 관리 방법을 모르시기 때문에 어르신들에게 담당 간호사로서 설명을 해줘요. 가끔 환자분께서 인터넷에서 찾은 잘못된 정보(한약 패치를 붙이면 복막투석에 효과가 좋다)를 말하실 때 아니다라고 확실히 설명을 해주고 잘못된 의료지식을 고쳐주는 그런 의사소통을 했죠. (A9)

3) 주제 3. 환자의 가치 및 선호도 존중

간호사는 노인환자의 가치 및 선호도를 확인하고 이를 가족 및 의료진과 공유하였다. 노인환자와 가족의 가치와 선호도를 반영한 의사결정이 내려지도록 서로 논의할 시간을 가지도록 권유하였으며, 의사결정을 조율할 수 있는 환경을 조성하였다. 또한 노인환자의 가치관에 근거한 개인의 요구를 존중하고 이를 노인환자의 입장에서 이해하려 노력하였다. 관련 범주는 '의사결정을 위한 심사숙고의 시간 제공', '의사결정의 조정과 중재', '환자의 가치와 선호도 이해'가 포함되었다.

(1) 의사결정을 위한 심사숙고의 시간 제공

간호사는 노인환자와 가족이 직면한 의사결정에 대해 재촉하지 않고 충분히 상의할 수 있도록 시간을 제공하였다. 간호사는 노인환자와 가족이 의사결정 상황을 이해하고 노인환자의 가치와 선호도를 확인하는 데 시간이 필요함을 이해하였다. 노인환자와 가족이 성급하게 결정을 내리지 않고 주어진 시간 동안 자신들의 가치와 선택지를 비교해 보도록 지원하였다.

(노인환자와 가족이 선택할 수 있는 선택지의) 장단점을 제공하고 다른 환자가 어려워 한 부분에 대해 알려드리고 최종 선택은 환자분과 보호자분이 상의하에 하실 수 있도록 충분한 시간을 드리는 편이에요. 시간을 드리면 환자분과 보호자분이 이것저것 이야기를 나누며 결정을 하셔서 저희(의료진)에게 전달해주세요. (A3)

환자분은 치료받고 싶어 하는데 보호자분들이 안 한다고 하는 경우도 있기는 했었어요. 그런 때는 딜레마에 빠지더라고요. 왜냐하면 환자의 선택하고 보호자의 선택이 다르니까. 환자분들이 고령이다 보니까 보호자 의견대로 가기 쉬워요. 저희가 어떤 선택이든 강요할 수는 없는 거니까 그래서 충분히 상의할 수 있는 시간을 드리고 의견을 다시 여쭤봐요. (A2)

(2) 의사결정의 조정과 중재

노인환자는 간호사와 단둘이 있을 때 가족에게 하지 않았던 속마음을 말하기도 하고 간호사는 노인환자가 원하는 방향으로 결정할 수 있도록 도왔다. 간호사는 노인환자의 의견을 가족에게 전달하거나 노인환자와 가족의 의견이 상충할 경우 양쪽의 의견을 같이 듣고 합의점을 제시하였다. 또한 의사와 노인환자, 가족의 의견을 조율하고 환자에게 최선의 이익이 되는 방향으로 의사결정을 조정하는 중재자 역할을 담당하였다.

환자와 단둘이 얘기할 기회가 생겼을 때 일단 환자분이 원하는 게 무엇인지 경청을 해줘요. 환자분이 원하는 게 분명히 있거든요. 그래서 그거에 대해서 일단은 충분히 들어주고 웬만하면 환자분들이 원하는 쪽으로 해드리려고 해요. (중간 생략) 일단은 환자의 입장부터 생각을 하고 환자를 위한 결정이 되도록 하고 있어요. (A2)

환자 얘기를 먼저 들어보고 보호자한테 전달을 하죠. 환자분은 이렇게 생각하시는데 보호자분들은 어떠신지 의향을 여쭙고 의견 충돌이 일어난다 좀 대립이 된다 싶으면 아무래도 환자가 보호자하고 상의를 할 수 있게 시간을 드리고 그러고 나서 일단 보호자분이 결정된 사항을 저희에게 전달하면 그걸 수렴해서 주치의한테 전달을 하고 의견을 통합시키고 있어요. (A4)

설명은 의사가 주로 하고 환자는 듣는 입장이라 저희가 그 가운데에서 전달자나 다리 역할을 해줘야 되는 것 같거든요. 환자와 제가 의사가 설명하는 것을 같이 듣지만 (환자가) 잘못 이해해서 보호자한테 아예 다른 방향으로 얘기를 전달하는 경우가 많아서 그럴 때 저희가 가운데에서 오해가 생기지 않도록 하고, 잘못된 의사소통으로 다른 의사결정이 되지 않게 방지하는 것 같아요. (A4)

(3) 환자의 가치와 선호도 이해

간호사는 노인환자의 삶의 목적과 가치관에 귀를 기울이고 이를 바탕으로 노인환자의 의사결정의 방향을 이해하려 노력하였다. 간호사는 노인환자가 다른 연령대와는 달리 삶의 경험이 다르며, 노인환자의 건강 상황을 이해하고 대응하기 위해서는 개별적인 접근과 배려가 필요한 것을 경험하였다. 간호사는 환자가 질병과정에서 원하는 것을 말하게 하고 삶의 가치관과 치료방법의 균형을 이루는 과정을 함께 하였다.

처음에 계속 투석이나 치료를 거부하다가 결국 복막투석을 하지 않고 바로 혈액투석을 하게 된 어르신이 있었거든요. 진료 기록을 보니까 계속 투석 거부를 했더라구요. 그래서 왜 자꾸 진료 거부하시냐고 하니까 '자기가 가장이라서 일을 해야 할 수밖에 없기 때문에 투석을 하면 일을 못하니까 거부했었다'라고 해서 '그 사람의 가장 최우선의 가치가 자신의 건강보다는 가정을 계속 풍요롭게 하는 거에 우선적이었다'라는 걸 이해할 수 있었어요. (A10)

노인환자는 삶의 경험이 다양해서 다른 연령대의 환자와는 다르게 힘들어요. (간호사가) 환자와 보호자와 라포 형성을 잘해 놓으면 노인환자와 보호자와 의사소통을 하는 데 좋은 영향을 주는 것 같아요. (A6)

간호사가 제공하는 정보를 믿게 하는 것은 환자와 간호사의 관계 속에서 나오는 것 같아요. 신뢰가 있으면 확신이 더 될 거고 믿음이 더 가고 그런 것은 관계 속에서 나오지 않나 싶어요. (A5)

4) 주제 4. 의사결정의 결과 평가

간호사는 의료진이 제공한 선택지에 노인환자와 보호자의 가치관이 부합된 의견이 결정되고 의사결정 내용에 만족하는지, 결정한 의견에 변화가 있는지 확인하였다. 또한 의사결정은 언제든 다시 할 수 있음을 설명하고 노인환자와 가족의 의사결정에 대한 역할과 범위를 확인시켰다. 이에 대한 범주는 '의사결정의 만족도 확인', '환자의 의사결정 변화 수용'이 포함된다.

(1) 의사결정의 만족도 확인

노인환자와 가족, 의료진이 함께 노인환자의 건강관련 의사결정을 내린 후 간호사는 선택에 대해 어떻게 생각하는지 만족하는지를 확인하였다. 간호사는 노인환자와 가족의 의사결정을 지속적으로 지원하고 의사결정 후 환자와 가족이 해야 할 역할에 대해 알려주었다.

보호자와 우리(의료진)가 신체억제대를 적용한다고 함께 결정해도 막상 신체억제대를 적용한 환자를 보고 나서 보호자의 마음이 변해서 억제대를 하지 않겠다고 했어요. 그때 다시 보호자와 환자에 대해

서 논의했어요. (A5)

환자에 대해 다 같이 결정했음에도 불구하고 '상태의 변동사항이나 추가적으로 추후 궁금한 것이 있으면 언제든지 말씀해주세요'라고 해요. (A5)

당뇨 환자가 당뇨조절이 되어서 퇴원결정이 나서 재가에서 관리할 수 있다고 해서 인슐린 투약을 자가교육하는데 환자가 고령이다 보니까 스스로 하기 어렵다고 하거나 미숙한 부분을 저희(의료진) 쪽에서도 발견하고 보호자도 집에서는 힘들 것 같다고 할 때 다시 상의해서 (퇴원을 미루고) 입원을 더 하는 경우도 있었어요. (A4)

(2) 환자의 의사결정 변화 수용

간호사는 노인환자와 가족의 의사결정에 변함이 없는지 확인하였다. 노인환자와 가족의 의사에 변화가 생기면 이에 대해 알리는 것을 주저하지 않도록 안심시켰다. 다른 선택지에 대해 노인환자와 가족, 의료진이 함께 다시 논의하여 새로운 결정을 다시 할 수 있음을 알렸다.

수술 날짜가 막상 다가오면 (환자와 보호자가) 고민을 하는 경우도 많았어요. 수술하기로 모두(환자, 보호자, 의사, 간호사)가 결정했는데 환자 연세가 많아 환자와 보호자가 고민하고 수술을 안 한다고 해서 수술 이외의 치료 방법에 대해 다시 의논했던 적이 있었어요. (A5)

환자와 보호자가 수술이라던지 시술을 결정하고 나서 날짜가 다가올 때 하루 전에 의사한테 알리는 과정에서 환자와 보호자에게 의견 변함없이 진행할 건지를 재차 확인했던 것 같아요. 선택에 대해 변함이 없는지. (A5)

DNR 결정할 때 그런 경우가 많은 것 같아요. 가족끼리 상의 후 DNR 서명 후에도 (결정에 대한) 변동사항이나 승압제나 인투베이션, CPR 등 처치에 대해서 의견이 변하면 언제든지 말해달라고 해요. (A5)

논의

본 연구는 만성질환 노인을 돌보는 간호사의 공유적 의사결정에서의 역할에 대한 인식을 파악하기 위해 시도되었다. 만성질환 노인을 돌보는 간호사의 공유적 의사결정에 대한 역할은 '의사결정 참여 촉진', '의사결정을 위한 정보 제공', '환자의 가치 및 선호도 존중', '의사결정의 결과 평가'의 4가지 주제로 확인되었다.

본 연구에서 확인된 첫 번째 주제인 의사결정 참여 촉진에서는 '환자의 의사결정에 대한 참여의지 확인', '의사결정의 주체와 의사결정 능력 확인', '협력적 문화 조성'의 3가지 범주가 도출되었다. 간호사

는 노인환자와 가족에게 의사결정이 필요하다는 것을 알렸으며 의사결정의 참여 의지와 의사결정을 할 수 있는 능력이 있는지를 확인하는 과정을 거쳤다. 또한 공유적 의사결정은 환자, 가족, 의사, 간호사 등 다양한 이해관계자의 가치와 자율성을 기반으로 한 협력적 개념이며 노인환자를 공유적 의사결정에 포함시키는 것은 노인환자의 자기결정권을 존중하고 자율성을 보장하는 중요한 방법이다[3,11]. 만성질환자의 치료에 대한 요구를 조사한 Rijken 등[24]의 연구결과에 의하면 만성질환자는 원하는 건강상태와 목표가 명확하지 않을 수 있고 만성질환이 진행된 시점에 따라 건강목표는 달라질 수 있다. 따라서 의료진은 환자의 관점에서 개별적인 치료가 제공될 수 있도록 의사결정에 대한 의사를 정기적으로 확인하고 환자와 가족, 의료진이 의사결정을 공유하는 것이 중요하다. 공유적 의사결정에 대한 의사와 간호사의 지식, 태도 및 경험을 탐색한 Mathijssen 등[19]의 연구에서도 의료진이 환자와 가족이 의사결정에 참여하고자 하는 의지와 정도를 이해하는 것이 공유적 의사결정에 중요한 요소이며 환자의 건강 결과에도 긍정적인 영향을 미쳤음을 보고하였다. 종합병원 간호사의 공유적 의사결정 참여 경험에 대해 면담한 Chung 등[8]의 연구에서 치료와 관련이 있는 대부분의 결정은 의료진이 주도하였다. 또한 대만과 필리핀 간호사를 대상으로 공유적 의사결정 경험을 면담한 선행연구[8,25] 결과에 따르면 가족의 역할이 중시되는 문화권에서는 환자가 아닌 가족의 주도하에 환자의 건강관련 의사결정이 이루어지는 경향이 두드러졌다. 본 연구결과에서도 간호사는 노인환자의 건강과 관련된 의사결정 주체가 주로 의료진과 가족이었음을 경험하였다. 하지만 간호사는 최대한 노인환자의 의사결정 의사와 능력을 확인하고 이들을 의사결정의 주체자로 포함시키려는 노력을 하고 있었다. 간호사는 노인의 건강결정 행위를 이해하기 위해 노인의 질병 과정에 있어 가족의 역할을 이해해야 하며, 사회문화적 맥락에서 환자와 가족이 이러한 역할을 어떻게 받아들이고 있는지를 확인하여야 한다. Bos-van den Hoek 등[17]의 연구에 따르면 공유적 의사결정 과정에 간호사가 참여하면 환자의 가치와 선호도에 더 많이 부합하는 결정으로 이어졌으며, 이는 환자와 가족의 삶의 질에 긍정적인 영향을 미쳤다. Mathijssen 등[19]의 연구에서도 의사와 간호사 간의 의사소통이 부족하여 상호 협력적이지 않은 의료환경은 공유적 의사결정을 방해하는 요인이 되어 의료진 간 협업과 소통하는 문화가 마련되어야 함을 강조하였다.

두 번째 주제인 의사결정을 위한 정보 제공에서는 '환자와 가족이 가진 정보의 정확성 확인', '합리적 의사결정을 돕는 정보 제공'의 2가지 범주가 도출되었다. 공유적 의사결정에 대한 병원간호사의 경험을 탐구하기 위해 FGI를 시행한 Moreno-Lacalle 등[25]의 연구에서 의료인이 특정 결정의 장단점을 제시한다는 것은 환자와 가족을 위한 선택지를 제공하는 것의 시작이며, 환자와 가족이 정보에 입각한 결정을 내릴 수 있도록 도와주는 주요 요인이었다. Chung 등[8]의 연구에서도 공유적 의사결정 과정에서 간호사는 환자와 가족

에게 자세한 설명을 하고 다양한 질문에 답해야 하므로 의사결정과 관련된 전문지식을 가지고 정보를 전달해야 한다고 하였다. 간호사는 노인환자와 가족에게 간호사의 이전 경험과 더불어 노인환자와 가족이 선택할 수 있는 선택지의 장단점을 설명하여 환자와 가족의 현재 상황에서 최선의 선택을 할 수 있도록 정확한 정보를 제공할 필요가 있다. 환자에게 개별화된 치료를 계획 및 제공하고 질병과 관련된 정보를 알려주는 것은 간호사의 대상자에 대한 전문직 윤리 의무에도 해당된다[5].

세 번째 주제인 환자의 가치 및 선호도 존중에서는 '의사결정을 위한 심사숙고의 시간 제공', '의사결정의 조정과 중재', '환자의 가치와 선호도 이해'의 3가지 범주가 도출되었다. 환자가 의사결정에 있어 시간적 압박을 경험하면 자신의 가치를 고려한 선택지를 생각할 시간을 충분히 가지지 못할 수 있으며, 가족과 필요한 의사소통을 하지 못해 자신의 선호도를 정확하게 전달하지 못할 수 있다. 따라서 간호사는 노인환자와 가족에게 주어진 선택지를 알리고 이에 대해 가치 및 선호도를 바탕으로 결정을 내릴 수 있도록 인내심을 가지고 충분한 시간을 제공해야 한다. 공유적 의사결정을 지원하는 도구가 입원환자의 건강결과에 미치는 영향을 조사한 Dobler 등[26]의 연구에서는 환자와 가족의 요구사항을 논의하고 의료인 간 정보 전달을 하는 데 있어 시간 부족은 공유적 의사결정 과정에 부정적 영향을 미쳤다. 공유적 의사결정에서 환자의 역할을 알기 위해 암환자 또는 만성질환자와 의료인을 대상으로 면담을 시행한 Keij 등[27]의 연구에서도 환자는 잠재적으로 생명을 위협할 수 있는 질병에 대한 다양한 선택 사항에 직면하면 정서적으로 고통을 느끼고 상황을 받아들이는 데 어려움을 겪으며 결정을 내리는 데 시간적 압박을 경험하였다. 본 연구에서 간호사는 노인환자와 가족, 의사와의 사이에서 중재자 역할을 하였으며, 가족들에게는 환자의 생각과 소망을 알리는 동시에 환자의 의사를 의사에게 전달해주는 대변인 역할을 하였다. 또한 입원환자의 연명의료 의사결정 참여에 대한 Arends 등[18]의 연구에서 간호사는 공유적 의사결정 과정에서 의사로부터 전달된 정보를 환자와 가족에게 알기 쉽게 전달하는 소통의 다리 역할을 하였다. Rijken 등[24]의 연구에서도 간호사는 다양한 선호도와 가치를 가진 이해관계자를 조정하거나 연결하며, 환자와 가족이 의료진에게 요구하는 기대치를 이해하고 이를 타 의료인이 이해할 수 있도록 전달하는 역할을 하였다. 노인환자를 돌보는 간호사의 공유적 의사결정 경험에 대한 Marriott-Statham 등[5]의 연구에서도 노인의 감정과 삶의 경험을 충분히 알아야 하며, 긍정적 관계를 형성할 수 있는 대인관계기술을 갖추어야 함을 강조하였다. 환자와 가족의 말을 귀 기울여 듣는 적극적 경청을 통해 환자의 가치와 선호도를 충분히 공유할 때 공동 목표에 대한 상호참여가 촉진되었다. 진행성 암환자를 대상으로 치료 만족도를 조사한 Engel 등[15]의 연구에 따르면 환자는 간호사와 긴밀하고 빈번한 접촉을 하므로 의사와 쉽게 공유하지 못했던 자신의 바람과 선호도를 공유하는 경우가 많았다.

네 번째 주제인 의사결정의 결과 평가에서는 '의사결정의 만족도 확인', '환자의 의사결정 변화 수용'의 2가지 범주가 도출되었다. 간호사는 노인환자와 가족이 의사결정을 내린 후 결과에 대한 의견을 확인하였고 후속 상담을 계획하였다. 간호사는 공유적 의사결정의 결과에 대한 노인환자와 가족의 만족 여부를 확인하고, 필요한 조치를 취함으로써 노인환자와 가족이 스스로 결정을 재고할 수 있도록 인지시켜야 한다. 이를 통해 간호사는 결정으로 인해 최선의 결과를 얻을 수 있도록 노인환자와 가족을 지원하며, 의사결정의 품질을 지속적으로 평가하고 개선하는 데 참여할 수 있다. 간호사가 의사결정의 결과를 확인하고 사후관리를 하는 것은 의사결정의 품질을 유지하고 개선하기 위한 필수적인 단계이다[28].

본 연구는 노인 건강관리 현장에서 간호사들이 경험하는 공유적 의사결정 과정에서의 역할에 대해 생생한 진술을 통해 탐색하고 간호사의 역할을 규명하고자 시도한 데 그 의의가 있다. 노인간호 현장에서 공유적 의사결정에 대한 요구가 많으며 간호사는 공유적 의사결정의 시작단계부터 평가단계까지 환자와 가족을 지원하는 역할을 담당할 수 있음을 확인할 수 있었다. 공유적 의사결정에서 간호사의 역할을 규명하고 이에 대한 교육훈련을 통해 그러한 역할이 좀 더 체계적으로 노인환자간호 현장에 적용되어야 할 것이다. 하지만 본 연구에 참여한 간호사는 일부 지역의 종합병원 및 병원에 근무하며 병원 환경에 있는 만성질환 노인을 돌보는 과정에서 경험한 공유적 의사결정을 10명의 간호사를 대상으로 탐색한 것으로 요양병원이나 지역사회 환경에서의 간호사의 역할을 확인하는 데는 그 한계가 있다. 추후연구에서 대상자의 수와 실무환경을 더 확대하여 연구할 필요가 있다.

결론 및 제언

본 연구는 만성질환 노인을 돌보는 간호사의 진술을 바탕으로 공유적 의사결정 과정에서의 간호사의 역할을 탐색하기 위해 FGI를 시행하였다. 10명의 간호사의 면담 내용을 분석한 결과, 의사결정 참여 촉진, 의사결정을 위한 정보 제공, 환자의 가치 및 선호도 존중, 의사결정의 결과 평가 4개의 주제가 도출되었다.

본 연구의 결과를 토대로 만성질환 노인을 위한 공유적 의사결정을 촉진할 수 있는 선행조건과 환경적 지원에 대한 연구를 제언한다. 또한 본 연구는 만성질환 노인을 돌보는 간호사를 대상으로 한 연구이며, 공유적 의사결정의 주체인 만성질환 노인환자와 가족의 경험과 요구에 대한 추가연구가 필요하다.

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Conflict of interest

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Data availability

Please contact the corresponding author for data availability.

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REFERENCES

1. Statistics Korea. 2020 Elderly statistics [Internet]. Statistics Korea; 2020 Sep 28 [cited 2023 May 10]. Available from: https://kostat.go.kr/board.es?mid = a10301060500&bid = 10820&act = view&list_no = 385322&tag = &nPage = 1&ref_bid

2. Ministry of Health and Welfare. 2020 National survey on the elderly [Internet]. Ministry of Health and Welfare; 2021 Jul 16 [cited 2023 May 10]. Available from: https://www.mohw.go.kr/react/jb/sjb030301vw.jsp?PAR_MENU_ID = 03&MENU_ID = 032901&CONT_SEQ = 366496&page = 1

3. Lynn JD, Ryan A, Kelly F. Sharing in decisions. In: McCormack B, McCance T, Bulley C, Brown D, McMillan A, Martin S, editors. Fundamentals of person-centred healthcare practice. Wiley Blackwell; 2021. p. 130-8.

4. Stirling C. Communication and shared decision-making. In: Vafeas C, Slatyer S, editors. Gerontological nursing: A holistic approach to the care of older people. Elsevier; 2021. p. 63-70.

5. Marriott-Statham K, Dickson CAW, Hardiman M. Sharing decision-making between the older person and the nurse: a scoping review. International Journal of Older People Nursing. 2023;18(1):e12507. https://doi.org/10.1111/opn.12507

6. Pel-Littel RE, Buurman BM, van de Pol MH, Twisk JWR, Tulner LR, Minkman MM, et al. Effects of a shared decision making intervention for older adults with multiple chronic conditions: the DICO study. BMC Medical Informatics and Decision Making. 2023;23(1):42. https://doi.org/10.1186/s12911-023-02099-2

7. Elwyn G, Frosch D, Thomson R, Joseph-Williams N, Lloyd A, Kinnersley P, et al. Shared decision making: a model for clinical practice. Journal of General Internal Medicine. 2012;27(10):1361-7. https://doi.org/10.1007/s11606-012-2077-6

8. Chung FF, Wang PY, Lin SC, Lee YH, Wu HY, Lin MH. Shared clinical decision-making experiences in nursing: a qualitative study. BMC Nursing. 2021;20(1):85. https://doi.org/10.1186/s12912-021-00597-0

9. Tariman JD, Katz P, Bishop-Royse J, Hartle L, Szubski KL, Enecio T, et al. Role competency scale on shared decision-making nurses: development and psychometric properties. SAGE Open Medicine. 2018;6:2050312118807614. https://doi.org/10.1177/2050312118807614

10. World Health Organization. WHO global strategy on people-centred and integrated health services. Interim Report. World Health Organization; 2015. Report No. WHO/HIS/SDS/2015.6.

11. Elwyn G. Shared decision making: what is the work? Patient Education and Counseling. 2021;104(7):1591-5. https://doi.org/10.1016/j.pec.2020.11.032

12. Cupples ME, Cole JA, Hart ND, Heron N, McKinley MC, Tully MA. Shared decision-making (SHARE-D) for healthy behaviour change: a feasibility study in general practice. BJGP Open. 2018;2(2):bjgpopen18X101517. https://doi.org/10.3399/bjgpopen18X101517

13. Suskind AM, Finlayson E. A call for frailty screening in the preoperative setting. JAMA Surgery. 2017;152(3):240-1. https://doi.org/10.1001/jamasurg.2016.4256

14. Rostoft S, van den Bos F, Pedersen R, Hamaker ME. Shared decision-making in older patients with cancer - what does the patient want? Journal of Geriatric Oncology. 2021;12(3):339-42. https://doi.org/10.1016/j.jgo.2020.08.001

15. Engel M, Brinkman-Stoppelenburg A, Nieboer D, van der Heide A. Satisfaction with care of hospitalised patients with advanced cancer in the Netherlands. European Journal of Cancer Care. 2018;27(5):e12874. https://doi.org/10.1111/ecc.12874

16. Hsu HC, Lin MH. The impact of an educational program on nurses' shared decision making attitudes: a randomized controlled trial. Applied Nursing Research. 2022;65:151587. https://doi.org/10.1016/j.apnr.2022.151587

17. Bos-van den Hoek DW, Thodé M, Jongerden IP, Van Laarhoven HWM, Smets EMA, Tange D, et al. The role of hospital nurses in shared decision-making about life-prolonging treatment: a qualitative interview study. Journal of Advanced Nursing. 2021;77(1):296-307. https://doi.org/10.1111/jan.14549

18. Arends SAM, Thodé M, De Veer AJE, Pasman HRW, Francke AL, Jongerden IP. Nurses' perspective on their involvement in decision-making about life-prolonging treatments: a quantitative survey study. Journal of Advanced Nursing. 2022;78(9):2884-93. https://doi.org/10.1111/jan.15223

19. Mathijssen EGE, van den Bemt BJF, Wielsma S, van den Hoogen FHJ, Vriezekolk JE. Exploring healthcare professionals' knowledge, attitudes and experiences of shared decision making in rheumatology. Rheumatic & Musculoskeletal Diseases Open. 2020;6(1):e001121. https://doi.org/10.1136/rmdopen-2019-001121

20. Kim SJ, Kim HJ, Lee KJ, Lee SO. Focus group research methodology. Hyunmoonsa; 2000.

21. Elo S, Kyngäs H. The qualitative content analysis process. Journal of Advanced Nursing. 2008;62(1):107-15. https://doi.org/10.1111/j.1365-2648.2007.04569.x

22. Choi SH, Jung J, Jung SW. Concept and procedure of qualitative content analysis. Journal of Qualitative Inquiry. 2016;2(1):127-55.

23. Lincoln YS, Guba EG. Naturalistic inquiry. Sage Publications; 1985. 331 p.

24. Rijken M, Bekkema N, Boeckxstaens P, Schellevis FG, De Maeseneer JM, Groenewegen PP. Chronic disease management programmes: an adequate response to patients' needs? Health Expectations. 2014;17(5):608-21. https://doi.org/10.1111/j.1369-7625.2012.00786.x

25. Moreno-Lacalle RC, Bascos MJG, Bandaay CM, Tibalao-Barrientos M, Galanza JS, Calub-Abul R, et al. Nurses' perceived readiness in evidence-based practice: an organizational assessment. Journal of Nursing Practice Applications & Reviews of Research. 2022;12(1):40-50. https://doi.org/10.13178/jnparr.2022.12.01.1207

26. Dobler CC, Sanchez M, Gionfriddo MR, Alvarez-Villalobos NA, Singh Ospina N, Spencer-Bonilla G, et al. Impact of decision aids used during clinical encounters on clinician outcomes and consultation length: a systematic review. BMJ Quality & Safety. 2019;28(6):499-510. https://doi.org/10.1136/bmjqs-2018-008022

27. Keij SM, van Duijn-Bakker N, Stiggelbout AM, Pieterse AH. What makes a patient ready for shared decision making? A qualitative study. Patient Education and Counseling. 2021;104(3):571-7. https://doi.org/10.1016/j.pec.2020.08.031

28. Stiggelbout AM, Pieterse AH, De Haes JC. Shared decision making: concepts, evidence, and practice. Patient Education and Counseling. 2015;98(10):1172-9. https://doi.org/10.1016/j.pec.2015.06.022

지역사회 거주 노인의 낙상 영향요인: 2020년 노인실태조사 자료 이용: 2차 자료 분석연구

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Factors influencing falls in the community-dwelling elderly: Data from the 2020 national survey of older people: A secondary analysis study

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Purpose: This study was performed to identify the factors influencing falls in the community-dwelling elderly using the raw data of the 2020 National Survey of Older People. **Methods:** The study included 9,920 community-dwelling seniors aged 65 years and older. The data were analyzed using a complex sampling design univariate logistic regression analysis. **Results:** Although the subjects of this study were 9,920 people, it can be generalized to 7,617,710 people because it is a probability sample using the stratified systematic sampling with cluster plots. As a result of this study, the fall rate of community-dwelling elderly was 6.4% and the weighted percentage was 7.1%. Satisfaction with economic status, number of chronic diseases, use of medical facilities, smoking, limitation of lower muscle strength, decreased visual acuity, limitation of daily living function, and housing type were identified as factors influencing falls in older people dwelling in the community. **Conclusion:** Based on the variables identified in this study, it is necessary for nurses to select high-risk groups for falls and to actively develop and implement nursing interventions to prevent falls.

Keywords: Aged; Accidental falls; Independent living

서론

1. 연구의 필요성

최근 노후에도 시설이 아닌 지역사회에 있는 자신의 거주지에서 살기를 희망하는 노인이 증가하면서 노년기 삶에서 주거와 지역 환경에 대한 중요성[1]과 노인의 안전에 대한 관심이 높아지고 있다[2].

낙상은 원래보다 더 낮은 위치 또는 바닥으로 본인의 의사와는 무관하게 떨어지는 것으로 정의되는데[3], 2020년 추락·미끄러짐 등 손상으로 입원한 환자의 약 80%가 65세 이상 노인이었다[4]. 낙상에 의한 노인의 신체적 손상은 골절, 내부 기관 손상, 염좌 및 긴장, 타박상 순으로 많았으며, 노인의 경우 다치면 빠른 회복이 어렵고[4], 재 낙상에 대한 두려움이 생겨 활동 저하 및 사회적 고립[5]과 삶의 질 저하로 이어진다[6,7]. 또한 2017년 낙상으로 인한 진료비는 65세 이상 노인 총 진료비의 25%를 넘는 5조 1,500억 원으로, 높은 의료비 비중을 차지하였다[8]. 이렇듯 노인의 건강과 가족 및 사회에

부담을 가중시키는 노인의 낙상을 예방하는 것은 지역사회 거주 노인에게 있어 중요한 건강관리의 요소이다.

과거에는 낙상을 예측 불가능한 사건으로 간주하였으나 노인에게 발생하는 낙상의 60%~70%는 예방이 가능하며[9], 낙상을 일으키는 예측 가능한 위험요인을 규명하는 것이 중요해짐에 따라 지역사회 거주 노인 낙상의 위험요인으로 크게 인구 사회학적 특성 중 연령, 성별, 배우자 유무, 교육수준[5,10-12]과 건강상태 및 건강행위와 정신건강 관련요인으로 주관적 건강상태[10-12], 의료 이용[11], 만성질환 수, 복용 중인 약물, 하지근력 상태, 낙상 두려움, 일상생활수행능력[5,10-12] 및 우울, 인지기능[10], 삶의 질[7]과 운동[5,10,13], 그리고 최근에는 주거환경[14]이 연구되고 있다.

그러나 지역사회에 거주하는 노인의 낙상 위험요인에 관한 연구는 이들 위험요인을 부분적으로 포함하고 있으며 대부분의 연구가 일부 지역에 거주하는 노인을 대상으로 하여[7,12-14], 영향요인을 규명하는 데 한계가 있다. 한편 노인실태조사는 일반 주거시설에 거주하는 만 65세 이상의 노인을 모집단으로 하는 우리나라 지역사회 거주 노인의 대표성 있는 자료이며 노인의 생활 여건 및 수준, 건강상태와 건강행위 등을 포함하고 있어 낙상 관련요인에 대한 분석 및 대책 수립이 가능하다는 측면에서 매우 가치 있는 자료이나 이와 같은 국가 수준에서 수집된 자료를 이용한 경우에도 확률표본으로 수집된 전국적인 대표성을 확보하기 위해서는 복합표본설계(complex designs)로 분석하여야 하나 일부 논문의 경우에는 단순임의추출법에 사용하는 일반 procedure를 사용하고 있어 잘못된 통계치를 산출할 수 있고 그 결과 그릇된 결론을 도출할 수 있다[15].

이에 본 연구에서는 가장 최근에 시행된 노인실태조사 원시자료를 이용하여, 선행연구에서 낙상의 위험요인으로 부분적으로 규명된 변수와 최근 노인의 건강과 관련하여 중요시되고 있는 기능상태, 삶의 만족도, 인지기능 등의 정신건강 요인과 환경적 요인을 포괄하여 다양한 측면에 대한 낙상의 영향요인을 복합표본설계로 분석하여 규명함으로써 지역사회에 거주하는 노인의 낙상예방을 위한 간호중재 개발에 기초자료를 제공하고자 시도되었다.

2. 연구목적

본 연구의 목적은 지역사회에 거주하는 우리나라 노인의 낙상실태와 낙상 관련요인(인구사회학적, 건강상태, 건강행위, 정신건강, 환경적 요인)의 실태를 파악하고, 낙상경험 유무에 따른 낙상 관련요인 및 낙상의 영향요인을 파악하는 것이다.

연구방법

1. 연구설계

본 연구는 2020년도 노인실태조사의 원시자료를 활용하여 우리나라 노인의 낙상에 영향을 미치는 요인을 파악하기 위한 2차자료 분석연구이다.

2. 연구대상

본 연구대상자는 만 65세 이상 노인으로, 2020년도 노인실태조사 전체 대상자 10,097명 중 본인 응답으로 조사를 완료한 9,920명을 대상으로 하여 낙상경험에 결측값이 있는 자는 제외하려고 했으나 결측값이 있는 대상자는 없어서 9,920명을 최종 분석에 포함하였다. 연구대상자는 선행연구를 참조하여[10], 낙상경험 유무에 따라 두 군으로 구분하였다.

3. 연구도구

본 연구의 종속변수는 낙상경험으로 선정하였다. 독립변수는 선행연구에서 노인의 낙상 영향요인으로 보고된 변수 중 노인실태조사[1]에서 활용 가능한 변수들을 추출하여 인구사회학적, 건강상태, 건강행위, 정신건강과 환경적 요인으로 구분하였으며, 각 변수의 범주는 다음과 같이 분류하였다.

1) 낙상실태

낙상실태는 낙상경험, 낙상횟수, 낙상 후 병원치료, 낙상이유를 포함하였다. 낙상경험은 "귀하께서는 지난 1년간 낙상(넘어짐, 미끄러짐 또는 주저앉음) 경험이 있습니까?"의 단일 문항에 대해 '예', '아니오'[10]로, 지난 1년간 낙상횟수는 평균 및 표준오차와 1회, 2회, 3회 및 4~10회로, 낙상 후 병원치료는 '예', '아니오'로 분류하였다. 낙상이유는 환경적 요인(바닥 미끄러움, 바닥, 도로 경사나 문턱, 어두운 조명 등)과 신체적 요인(발을 헛디딤, 어지러움, 다리에 힘이 풀림)으로 구분하였다.

2) 인구 사회학적 요인

인구 사회학적 요인에는 성별, 연령, 결혼상태, 교육수준, 취업, 가구소득, 자산을 포함하였다. 연령은 '65~74세', '75~84세', '85세 이상'으로 재분류하였다[5]. 결혼상태는 배우자 '있음'과 '없음'으로 분류하였다. 교육수준은 '초졸 이하', '중졸', '고졸', '대졸 이상'으로, 취업은 '예', '아니오'로, 가구소득은 노인실태조사 오분위별 기준에 따라 제1오분위 945.96만 원 미만, 제2오분위 945.96만 원 이상 ~1,582.20만 원 이하, 제3오분위 1,582.20만 원 초과~2,660만 원 미만, 제4오분위 2,660만 원 이상~4,324.58만 원 이하, 제5오분위 4,324.58만 원 초과로 분류하였다. 자산은 부동산 자산 유무로 응답한 자료를 이용하였다.

3) 건강상태 요인

건강상태 요인은 시력장애, 청력장애, 하지근력 제한[5,16], 만성질환[5,10], 약물복용[10,12], 기능상태[5,6,10,11], 주관적 건강상태[10-12], 의료 이용[11]을 포함하였다. 시력장애와 청력장애는 일상생활의 불편함에 대해 '없음'과 '있음'으로 재분류하였다. 하지근력 제한은 5회 앉았다 일어서기를 수행한 경우는 '아니오'로, 못한 경우는 '예'로 재분류하였다. 만성질환은 '의사진단을 받고 3개월 이상 경과된 질환의 갯수를 '0개', '1~2개', '3~4개', '5개 이상'으로, 약물복용은 '의사처방 약물의 종류를 '0개', '1~2개', '3~4개', '5개 이상'으로 범주화하였다. 기능상태는 일상생활수행능력(activities of daily living), 즉 옷 입기, 세수·양치질·머리감기, 목욕 또는 샤워하기, 차려 놓은 음식 먹기, 누웠다 일어나 방 밖으로 나가기, 화장실 출입과 대소변 후 닦고 옷 입기, 대소변 조절하기 등의 7개 항목으로, 도구적 일상생활수행능력(instrumental activity of daily livings)은 몸단장, 집안일, 식사준비, 빨래, 제시간에 정해진 양의 약 챙겨먹기, 금전 관리, 근거리 외출하기, 물건 구매 결정·돈 지불·거스름돈 받기, 전화 걸고 받기, 교통수단 이용하기 등의 10개 항목을 사용하였다. 기능상태 제한 여부는 일상생활수행능력과 도구적 일상생활수행능력 중 한 항목이라도 부분도움 이상의 기능제한이 있는 경우 기능제한이 '있음'으로, 없는 경우에는 '없음'으로 재분류하였다[5]. 주관적 건강상태는 "평소 건강상태가 어떻다고 생각하십니까"라는 질문에 응답한 자료를 '매우 건강하다', '건강한 편이다'는 '좋음'으로, '그저 그렇다', '건강이 나쁜 편이다', '건강이 매우 나쁜 편이다'는 '나쁨'으로[11,12], 의료 이용은 지난 1개월 동안 의료기관 이용(외래)이나 1년 이내 입원경험 둘 중에 하나라도 있을 경우에 대해 '있다'로, 없는 경우는 '없다'로 재분류하였다.

4) 건강행위요인

건강행위요인은 흡연, 음주, 운동[5], 영양관리를 포함시켰다. 흡연은 '예', '아니오'로, 음주는 '지난 1년간 전혀 마시지 않음', '한 달에 1회', '한 달에 2~3회 이상'으로 재분류하였다. 운동은 지속적으로 10분 이상 운동 여부에 대해 '예', '아니오'로, 운동빈도는 주당 운동일수를 '안함', '1~2회', '3회 이상'으로, 운동시간은 회당 '안 함', '10~20분', '30분 이상'으로 재분류하였다. 영양관리는 지역사회 노인의 영양위험정도를 파악하기 위하여 개발된 간이영양위험지표(Nutrition Screening Initiative)를 이용하였다. 간이영양위험지표의 내용(가중치)은 질병(2점), 불량한 식사(3점), 과일·채소(2점), 음주(2점), 치아손실·구강통증(2점), 경제적 어려움(4점), 감소된 사회적 접촉(1점), 여러 약물복용(1점), 의도하지 않은 체중변화(2점), 식사관련 도움 필요(2점)의 총 10개 항목으로 구성되어 있다. 0~2점은 '양호', 3~5점은 '보통', 6점 이상은 '불량'으로 구분하였다[17].

5) 정신건강 요인

정신건강 요인은 우울, 인지기능[10] 및 삶의 만족도와 불면증을 포함하였다. 우울은 단축형 노인우울척도(Short Form of Geriatric Depression Scale)를 사용하였다. 총 15개 문항에 대해 '예'(1점), '아니오'(0점)의 양분척도로 구성되어 있으며 긍정문항인 1, 5, 7, 11, 13번의 5문항은 역코딩하여 점수가 높을수록 우울 정도가 높은 것을 나타낸다. 0~7점은 우울 '없음'으로, 8~15점은 우울 '있음'으로 재분류하였다[18]. 인지기능은 치매선별용 한국어판 간이정신상태검사(Korean version of Mini-Mental State Examination for Dementia Screening)로 측정하였다. 지남력 10문항, 기억력 2문항, 주의집중 및 계산능력 1문항, 언어기능 4문항, 이해 및 판단구성 2문항의 총 19문항에 대해 틀림은 '0점', 맞음은 '1점'을 부여하며, 최고점수는 30점이다. 성별, 연령 및 교육수준을 고려하여 산출된 점수를 기준 점수와 비교하여 인지기능 저하 '있음'과 '없음'으로 재분류하였다[19]. 삶의 만족도는 건강상태, 경제상태, 배우자와의 관계, 자녀와의 관계, 친구 및 지역사회와의 관계, 사회여가문화활동과 삶 전반에 대하여 '매우 만족함'과 '만족함'은 '예'로, '그저 그렇다', '만족하지 않음', '전혀 만족하지 않음'은 '아니오'로 재분류하였다. 불면증은 의사진단 후 3개월 경과 여부에 대해 '예', '아니오'로 구분하였다.

6) 환경적 요인

환경적 요인으로는 주거환경 요인(거주주택에 대한 만족, 주택종류, 생활하기에 편리함)을 포함하였다. 거주주택에 대한 만족은 '매우 만족', '만족'은 '예'로, '그저 그렇다', '만족하지 않는 편이다', '전혀 만족하지 않는 편이다'는 '아니오'로 재분류하였다. 주택종류는 '단독주택', '아파트', '연립·다세대 주택', 기타에 응답한 고시텔, 오피스텔, 원룸은 '오피스텔'로, 비거주용 건물, 판자집 비닐하우스는 '비거주용 건물'로 재분류하였다. 생활하기에 편리함은 '생활하기에 불편한 구조이다', '생활하기에 불편한 구조는 아니지만, 노인을 배려한 설비는 없다', '노인을 배려한 설비(문턱 없애기, 경사조절,

손잡이 설치 등)를 갖추고 있다'에 대해 조사원이 직접 확인한 자료를 이용하였다.

4. 자료수집

2020년도 노인실태조사는 한국보건사회연구원 생명윤리위원회의 승인을 받아 수행되었다(IRB No. 2020-36). 대표성 있는 표본을 추출하기 위해 층화집락추출방법(stratified cluster sampling)을 사용하여 조사되었으며 목표 모집단은 2020년 11월 현재 전국 17개 시·도의 일반 주거시설에 거주하는 만 65세 이상의 노인이다. 본 연구에 앞서 본 연구자가 소속하고 있는 강서대학교 기관생명윤리위원회의 승인을 받은 후(IRB No. GSUIRB-2022-18) 보건복지데이터 포털에서 제시한 원시자료 이용에 대한 절차에 따라 2020년도 노인실태조사 원시자료[1]를 파일로 제공받아 사용하였다.

5. 자료분석

IBM SPSS Statistics 26 프로그램(IBM Corp.)을 사용하였다. 낙상실태는 빈도, 백분율, 평균 및 표준오차로, 낙상 관련요인(인구사회학적, 건강상태, 건강행위, 정신건강, 환경적 요인)은 서술적 통계분석을 하여 가중치를 반영하지 않은 결과(n, %)와 가중치를 반영한 결과인 가중 퍼센트(weighted percent [W, %])로 제시하였다. 낙상경험 유무 두 군에 대한 관련요인 분석은 복합표본설계 단변량 단순 로지스틱 회귀분석을, 낙상에 대한 영향요인 분석은 복합표본

설계 단변량 다중 로지스틱 회귀분석을 하였다.

연구결과

1. 낙상실태

본 연구에서 지난 1년간 낙상경험이 있는 대상자는 6.4%이고 가중치를 반영한 결과인 가중퍼센트는 7.1%였다. 낙상경험이 있는 대상자의 지난 1년간 낙상횟수는 평균 1.56±1.26회였고 낙상횟수는 1회가 67.3%로 가장 많았으며 3~10회인 경우도 8.8%나 되었다. 낙상 후 병원 치료를 받은 경우는 69.5%였다. 낙상이유는 환경적 요인으로 바닥 미끄러움 30.3%, 바닥이나 도로의 문턱 12.5%, 사람이나 사물에 부딪힘 8.2%, 도로 경사 3.0%, 어두운 조명 등 2.5% 순이었으며 신체적 요인으로는 발을 헛디딤 20.1%, 다리에 힘이 풀림 18.3%, 갑자기 어지러움 4.1%였다(Table 1).

2. 대상자의 특성 및 낙상 관련요인 실태

대상자의 인구 사회학적 특성을 살펴보면 성별은 여자가 60.0%, 연령은 65~74세가 60.3%, 결혼상태는 배우자 있음이 59.0%, 가구소득은 제1오분위가 24.6%로 가장 많았다(Table 2). 건강상태 요인은 시력장애 있음 33.1%, 하지근력 제한 있음이 21.9%였다. 만성질환이 1~2개 있는 경우가 56.8%, 복용약물의 종류가 1~2가지인 군이 56.3%, 외래나 입원 등 의료시설이용은 있음이 68.9%로 가장 많

Table 1. Distribution of the Eldery According to Fall Experience (*n*=9,920, *N*=7,617,710)

Variable	Category	*n*	%	*N*	W (%)	Mean±SE
Experience of fall (for 1 year)	Yes	633	6.4	542,961	7.1	
	No	9,287	93.6	7,074,748	92.9	
Number of fall per year (n=633, N=542,961)	1	426	67.3	358,856	66.1	
	2	151	23.9	131,682	24.3	1.56±1.26
	3	26	4.1	27,607	5.1	
	4~10	30	4.7	24,814	4.6	
Hospital treatment (n=633, N=542,961)	Yes	440	69.5	391,431	72.1	
	No	193	30.5	151,529	27.9	
Reasons of fall (n=633, N=542,961)	Environmental factors					
	Slippery floor	192	30.3			
	Bumped into something	52	8.2			
	Uneven road	79	12.5			
	Steep road	19	3.0			
	Dark lighting	16	2.5			
	Physical factors					
	Sprained leg (stumbled)	127	20.1			
	Suddenly dizziness	26	4.1			
	Legs weakened (suddenly sat down)	116	18.3			
	Others	6	0.9			

n=Unweighted sample size; *N*=Weighted sample size; SE=Standard error; W (%)=Weighted percentage.

앞다. 기능상태 제한 있음은 일상생활 기능제한 4.2%, 도구적 일상생활 기능제한 10.1%였고 주관적 건강상태는 나쁨이 50.2%로 더 많았다(Table 3). 건강행위요인에서는 운동을 지속적으로 10분 이상 시행함이 52.3%였으며 영양상태는 양호함이 77.0%였다(Table 3). 정신건강 요인을 살펴보면 만족도는 자녀 71.1%, 친구 및 지역사회 60.0%로 만족도가 높은 반면 경제상태, 배우자와 사회여가문화활동에 대한 만족도는 각각 39.2%, 43.2%, 44.3%로 만족도가 낮았다(Table 4). 우울은 13.0%, 인지기능 저하는 25.8%에서 있었다. 환경적 요인으로 주거환경에 만족함이 75.2%, 주거유형으로는 아파트에 거주하는 군이 47.4%, 주택구조에 대해서는 '생활하기에 불편한 구조는 아니지만, 노인을 배려한 설비는 없다'가 71.4%로 가장 많았다(Table 4).

3. 낙상경험 유무에 따른 낙상 관련요인

인구 사회학적 요인에서 낙상경험 유무 두 군 간에 유의한 차이를 보인 요인은 χ^2 test에서는 성별, 연령, 교육수준, 결혼상태, 직업이었고 낙상이 없는 군을 기준으로 한 단변량 로지스틱 회귀분석에서 유의한 차이를 보인 인구 사회학적 요인은 없었다(Table 2).

유의한 차이를 보인 건강상태 요인은 단변량 로지스틱 회귀분석에서는 시력장애, 하지근력 제한, 만성질환 수, 의료 이용, 일상생활기

능 제한이었다. 낙상이 없는 군에 비해 낙상이 발생할 가능성은 시력장애가 있을 때 1.87배(95% confidence interval [CI]＝1.54~2.27), 하지근력 제한이 있을 때 1.81배(95% CI＝1.28~2.56), 만성질환의 수는 없음에 비해 1~2개 있는 군에서 1.74배(95% CI＝1.28~2.35), 3~4개 있는 군에서 3.32배(95% CI＝2.42~4.54), 5개 이상 있는 군은 7.39배(95% CI＝5.15~10.59) 증가하였다. 의료시설을 이용한 경우에 1.90배(95% CI＝1.56~2.33), 일상생활기능 제한은 없음에 비해 있음에서 1.75배(95% CI＝0.97~3.16)가 증가하였다(Table 3).

유의한 차이를 보인 건강행위요인은 단변량 로지스틱 회귀분석에서는 흡연이었다. 낙상이 없는 군에 비해 낙상이 발생할 가능성은 흡연 안함에 비해 흡연을 하는 경우에 1.67배(95% CI＝1.10~2.54) 증가하였다(Table 3).

유의한 차이를 보인 정신건강 요인은 단변량 로지스틱 회귀분석에서는 경제상태 만족도에서만 유의한 차이를 보였다. 낙상이 없는 군에 비해 낙상이 발생할 가능성은 경제상태에 만족하는 군에 비해 만족하지 않는 군에서 1.71배(95% CI＝1.12~2.44)가 증가하였다(Table 4).

유의한 차이를 보인 환경적 요인은 단변량 로지스틱 회귀분석에서는 주택종류, 생활하기에 편리함이었다. 낙상경험이 없는 군에 비해 낙상할 가능성은 단독주택에 비해 아파트가 1.69배(95%

Table 2. Univariate Simple Logistic Regression of Socio-Demographic Factors According to Fall Experience of the Subjects (*n*=9,920, *N*=7,617,710)

| Variable | Category | n (%) | Experience of fall | | χ^2 (*p*-value) | Yes (ref: no), OR (95% CI) |
			Yes (*n*=633, *N*=542,961), W (%)	No (*n*=9,287, *N*=7,074,749), W (%)		
Gender	Men	3,971 (40.0)	4.8	95.2	13.01 (.007)**	1
	Women	5,949 (60.0)	7.4	92.6		1.10 (0.78~1.57)
Age (year)	65~74	5,977 (60.3)	5.2	94.8	38.45 (<.001)**	1
	75~84	3,333 (33.6)	7.9	92.1		0.97 (0.69~1.37)
	≥85	610 (6.1)	10.3	89.7		1.12 (0.50~2.50)
Education	Below elementary school	4,431 (44.7)	8.0	92.0	20.64 (.001)**	1
	Middle school	2,330 (23.5)	6.0	94.0		0.86 (0.59~1.25)
	High school	2,654 (26.8)	4.9	95.1		0.72 (0.49~1.08)
	Above college	505 (5.1)	3.3	96.1		0.56 (0.26~1.19)
Marriage	With spouse	5,849 (59.0)	4.6	95.4	48.94 (<.001)**	1
	Without spouse	4,071 (41.0)	9.0	91.0		2.07 (1.75~2.43)
Current job	Yes	3,773 (38.0)	4.8	95.2	18.86 (<.001)**	1.28 (0.71~1.79)
	No	6,147 (62.0)	7.4	92.6		1
Household income	1st quartile	2,440 (24.6)	7.5	92.5	5.40 (.248)	1
	2nd quartile	2,069 (20.9)	6.5	93.5		0.86 (0.68~1.08)
	3rd quartile	1,924 (19.4)	5.4	94.6		0.71 (0.55~0.90)
	4th quartile	1,834 (18.5)	5.3	94.7		0.70 (0.54~0.90)
	5th quartile	1,653 (16.7)	6.8	93.2		0.91 (0.71~1.15)
Assets	Yes	9,461 (95.4)	6.4	93.6	0.89 (.345)	2.36 (0.84~6.60)
	No	459 (4.6)	8.0	92.0		1

**p<.010; CI=Confidence interval; *n*=Unweighted sample size; *N*=Weighted sample size; OR=Odds ratio; W (%)=Weighted percentage.

Table 3. Univariate Simple Logistic Regression of Health Status and Health Behavior Factors According to Falls Experience of the Subjects (n=9,920, N=7,617,710)

Variable	Category	n (%)	Experience of fall Yes (n=633, N=542,961), W (%)	No (n=9,287, N=7,074,749), W (%)	χ^2 (p-value)	Yes (ref: no), OR (95% CI)
Health status factors						
Vision impairment	Yes	3,286 (33.1)	9.3	90.7	43.71 (<.001)**	1.87 (1.54~2.27)*
	No	6,634 (66.9)	4.9	95.1		1
Hearing impairment	Yes	2,297 (23.2)	9.7	90.3	20.46 (<.001)**	1.15 (0.93~1.42)
	No	7,623 (76.8)	5.6	94.4		1
Limitation of lower extremity muscle strength	Yes	2,175 (21.9)	11.0	89.0	61.12 (<.001)**	1.81 (1.28~2.56)**
	No	7,285 (73.4)	4.9	95.1		1
	Missing	460 (4.6)				
Number of chronic disease	0	1,678 (16.9)	3.0	97.0	129.78 (<.001)**	1
	1~2	5,634 (56.8)	5.2	94.8		1.74 (1.28~2.35)**
	3~4	2,124 (21.4)	9.4	90.6		3.32 (2.42~4.54)**
	≥5	484 (4.9)	18.8	81.2		7.39 (5.15~10.59)**
Number of medications class/day	0	1,856 (18.7)	3.2	96.8	102.12 (<.001)**	1
	1~2	5,583 (56.3)	5.5	94.5		2.90 (0.84~9.99)
	3~4	2,065 (20.8)	9.4	90.6		1.54 (0.38~6.35)
	≥5	416 (4.2)	17.0	83.0		2.67 (0.54~13.25)
Medical utilization	Yes	6,832 (68.9)	7.4	92.6	61.18 (<.001)**	1.90 (1.56~2.33)**
	No	3,088 (31.1)	4.0	96.0		1
Limitation of ADL	Yes	421 (4.2)	23.0	77.0	133.13 (<.001)**	1.75 (0.97~3.16)*
	No	9,499 (95.8)	5.6	94.4		1
	Yes	1,002 (10.1)	16.3	83.7	127.52 (<.001)**	1.39 (0.83~2.32)
	No	8,918 (89.9)	5.3	94.7		1
Subjective health status	Good	4,940 (49.8)	3.7	96.3	75.98 (<.001)**	1
	Bad	4,980 (50.2)	9.0	91.0		1.25 (0.86~1.83)
Health behavior factor						
Smoking	Yes	1,089 (11.0)	6.9	93.1	2.40 (.122)	1.67 (1.10~2.54)*
	No	8,831 (89.0)	6.3	93.7		1
Drinking (frequency)	No	6,243 (62.9)	7.1	92.9	12.86 (<.001)**	1
	1/mo	1,389 (14.0)	6.3	93.7		1.07 (0.70~1.63)
	≥2~3/mo	2,288 (23.1)	4.4	95.6		0.76 (0.49~1.16)
Exercise	Yes	5,187 (52.3)	5.9	94.1	0.33 (.568)	0.85 (0.72~0.99)
	No	4,733 (47.7)	6.9	93.1		1
Frequency of exercise (week)	No exercise	4,733 (47.7)	6.9	93.1	0.72 (0.699)	1
	1~2	576 (5.8)	5.9	94.1		0.85 (0.59~1.22)
	≥3	4,611 (46.5)	5.9	94.1		0.85 (0.72~1.00)
Duration of exercise (minute)	No	4,733 (47.7)	6.9	93.1	1.79 (.409)	1
	10~20	535 (5.4)	6.9	93.1		1.00 (0.70~1.42)
	≥30	4,652 (46.9)	5.8	94.2		0.82 (0.70~0.98)
Nutrition management	Good	7,639 (77.0)	4.7	95.3	109.89 (<.001)**	1
	Not bad	1,561 (15.7)	11.5	88.5		1.33 (0.89~2.01)
	Poor	720 (7.3)	13.3	86.7		1.20 (0.66~2.19)

*p<.050; **p<.010; CI=Confidence interval; ADL=Activities of daily living; IADL=Instrumental activity of daily livings; n=Unweighted sample size; N=Weighted sample size; OR=Odds ratio; W (%)=Weighted percentage.

CI=1.22~2.34), 오피스텔은 11.60배(95% CI=3.91~34.39)가 증가하였다. 생활하기에 편리함은 '생활하기에 불편한 구조이다'에 비해 '생활하기에 불편한 구조는 아니지만, 노인을 배려한 설비는 없다'에서 낙상할 가능성이 1.38배(95% CI=0.78~2.42) 증가하였다 (Table 4).

Table 4. Univariate Simple Logistic Regression of Mental health and Environmental Factors According to Fall Experience of the Subjects (*n*=9,920, *N*=7,617,710)

Variable	Category	*n* (%)	Experience of fall		χ^2 (*p*-value)	Yes (ref: no), OR (95% CI)
			Yes (*n*=633, *N*=542,961), W (%)	No (*n*=9,287, *N*=7,074,749), W (%)		
Mental health factors						
Satisfaction of health conditions	Yes	5,212 (52.5)	3.7	96.3	96.49 (<.001)**	1
	No	4,708 (47.5)	9.3	90.7		1.09 (0.72~1.63)
Satisfaction of economic conditions	Yes	3,892 (39.2)	4.0	96.0	45.27 (<.001)**	1
	No	5,550 (55.9)	7.9	92.1		1.71 (1.12~2.44)**
	Missing	478 (4.8)				
Satisfaction with spouse	Yes	4,282 (43.2)	3.5	96.5	16.22 (<.001)**	1
	No	1,566 (15.8)	7.5	92.5		1.26 (0.91~1.77)
	Missing	4,072 (41.0)				
Satisfaction with child	Yes	7,054 (71.1)	5.6	94.4	7.56 (0.006)**	1
	No	2,497 (25.2)	8.0	92.0		1.18 (0.84~1.65)
	Missing	369 (3.7)				
Satisfaction with cultur- al activities	Yes	4,394 (44.3)	4.6	95.4	13.51 (.002)**	1
	No	5,526 (55.7)	7.9	92.1		0.96 (0.69~1.34)
Satisfaction with friends and community	Yes	5,928 (59.8)	5.0	95.0	16.19 (<.001)**	1
	No	3,992 (40.2)	8.4	91.6		1.14 (0.80~1.65)
Overall satisfaction of life	Yes	5,140 (51.8)	4.3	95.7	47.88 (<.001)**	1
	No	4,780 (48.2)	9.4	90.6		0.75 (0.48~1.15)
Depression	Yes	1,293 (13.0)	13.4	86.6	78.46 (<.001)**	1.14 (0.74~1.76)
	No	8,627 (87.0)	5.3	94.7		1
Impairment of cognitive function	Yes	2,561 (25.8)	7.1	92.9	5.01 (.025)*	1.02 (0.74~1.40)
	No	7,359 (74.2)	6.1	93.9		1
Insomnia	Yes	187 (1.9)	15.0	85.0	15.35 (<.001)**	1.60 (0.75~3.42)
	No	9,733 (98.1)	6.2	93.8		1
Environmental factors						
Satisfaction of residen- tial housing	Yes	7,460 (75.2)	5.9	94.1	5.46 (.020)*	1
	No	2,460 (24.8)	7.7	92.3		0.98 (0.69~1.41)
Housing types	Detached house	3,931 (39.6)	5.5	94.5	28.13 (<.001)**	1
	Apartment	4,700 (47.4)	6.4	93.6		1.69 (1.22~2.34)*
	Row · multi-family house	1,205 (12.1)	8.6	91.4		2.20 (1.40~3.46)
	Officetels	55 (0.6)	16.4	83.6		11.60 (3.91~34.39)**
	Non-residential ac- commodation	29 (0.3)	6.9	93.1		3.39 (0.64~18.03)
Convenience for living	Uncomfortable for living	975 (9.8)	7.4	92.6	1.87 (.393)	1
	No facilities for the elderly	7,078 (71.4)	6.5	93.5		1.38 (0.78~2.42)**
	Having facilities for the elderly	1,867 (18.8)	5.4	94.6		0.89 (0.46~1.72)

p<.050; **p*<.010; CI=Confidence interval; *n*=Unweighted sample size; *N*=Weighted sample size; OR=Odds ratio; W (%)=Weighted percentage.

4. 낙상에 대한 영향요인

낙상에 대한 영향요인을 파악하기 위해 종속변수는 낙상경험을, 독립변수는 단변량 로지스틱 회귀분석에서 낙상 두 군 간에 유의한 차이를 보인 시력장애, 하지근력 제한, 만성질환 수, 의료 이용, 일상 생활기능 제한, 흡연, 경제상태 만족도, 주택종류, 생활하기에 편리

함을 투입하여 낙상이 없는 군을 기준 변수로 하여 분석한 결과는 Table 5와 같다. 낙상이 없는 군에 비해 낙상이 발생할 가능성에 유의하게 영향을 준 변수는 경제상태 만족도, 만성질환 수, 의료 이용, 흡연, 하지근력 제한, 시력장애, 일상생활기능 제한, 주택종류였다. 구체적으로는 낙상이 없는 군에 비해 낙상할 가능성은 경제상태에

Table 5. Univariate Multiple Logistic Regression Analysis of Influencing Factors According to Falls Experience of the Subjects (*n*=9,920, *N*=7,617,710)

Variable	Category	Yes (ref: no) (*n*=633, *N*=542,961)	
		Adjusted OR (95% CI)	*p*-value
Satisfaction of economic conditions	Yes	1	
	No	1.59 (1.25~1.93)	<.001
Number of chronic disease	0	1	
	1~2	1.20 (0.88~1.64)	<.001
	3~4	1.85 (1.33~2.57)	.043
	≥5	2.64 (1.76~3.94)	<.001
Medical utilization	Yes	2.05 (1.42~2.67)	<.001
	No	1	
Smoking	Yes	1.38 (1.05~1.81)	.017
	No	1	
limitation of lower extremity muscle strength	Yes	1.75 (1.44~2.11)	<.001
	No	1	
Vision impairment	Yes	1.43 (1.20~1.71)	<.001
	No	1	
Limitation of ADL	Yes	1.85 (1.35~2.47)	<.001
	No	1	
Housing types	Detached house	1	
	Apartment	1.38 (1.13~1.68)	.256
	Row · multi-family house	1.77 (1.33~2.27)	.912
	Officetels	5.82 (2.90~12.88)	<.001
	Non-residential accommodation	1.12 (0.20~7.59)	.515
Convenience for living	No facilities for the elderly	1	
	Uncomfortable for living	0.99 (0.75~1.32)	.354
	Having facilities for the elderly	0.83 (0.59~1.18)	.129

ADL=Activities of daily living; CI=Confidence interval; *n*=Unweighted sample size; *N*=Weighted sample size; OR=Odds ratio.

만족하는 군에 비해 불만족군에서 1.59배(95% CI = 1.25~1.93), 만성질환 수는 없음에 비해 1~2개 있는 군에서 1.20배(95% CI = 0.88~1.64), 3~4개 있는 군은 1.85배((95% CI = 1.33~2.57), 5개 이상인 군은 2.64배(95% CI = 1.76~3.94)가 증가하였다. 의료이용은 이용하지 않은 군에 비해 이용한 군에서 2.05배(95% CI = 1.42~2.67), 흡연은 안 하는 군에 비해 흡연하는 군에서 1.38배(95% CI = 1.05~1.81), 하지근력 제한은 없음에 비해 있음에서 1.75배(95% CI = 1.44~2.11) 낙상 가능성이 증가하였다. 시력저하가 없음에 비해 있음에서 1.43배(95% CI = 1.20~1.71), 일상생활기능 제한이 없음에 비해 있는 군에서 1.85배(95% CI = 1.35~2.47), 주택종류는 단독주택에 비해 오피스텔 거주 군에서 낙상 가능성이 5.82배(95% CI = 2.90~12.88) 증가하였다(Table 5).

논의

본 연구는 지역사회에 거주하는 노인의 낙상 및 낙상 관련요인의 실태를 파악하고 낙상에 미치는 영향요인을 확인하고자 시도되었다.

본 연구결과 지난 1년간 낙상률은 6.4%였으며 이를 노인실태조사

에서 제시한 가중치(weight_f)를 주어 가중 퍼센트를 구한 결과는 7.1%로, 이는 우리나라 일반 주거시설에 거주하는 만 65세 이상 노인의 낙상률로 일반화할 수 있다. 이를 선행연구와 비교해보면 최근 1년간 낙상률이 우리나라 일부 지역사회 노인 대상 연구에서 16.3% [12], 51.2% [20], 51.5% [14]와 미국의 국가규모의 연구에서 16.4% [21] 및 23% [22]와 브라질의 37.1% [11]에 비해 크게 낮은 수치이고, 노인실태조사 자료를 이용한 선행연구의 경우에도 2014년 24.8% [5,10]와 2017년 15.7% [16]에 비해서도 낮았다. 특히 본 연구에서 낙상률이 급격히 감소하여 한 자리 숫자인 6.4%를 보였는데 이러한 결과는 노인실태조사가 2020년 9월 14일부터 11월 20일까지의 COVID-19 상황에서 이루어져 집에 머무는 시간이 증가한 것과 관련이 있을 것으로 사료된다. 실제로 일부 지역사회 노인 대상 연구에서 71.6% [12]에서 낙상이 발생한 장소가 실외인 것으로 나타나 이를 지지한다. 본 연구에서 1년간 낙상을 경험한 횟수는 평균 1.56회로, 1회 낙상한 경우가 67.3%로 가장 많았으나 최대 10회까지 낙상한 경우도 있어 우려가 되는 부분이다. 이는 2017년 노인실태조사 자료를 이용한 연구에서 낙상횟수 1회인 경우가 65.2%인 결과[16]와 유사하나, 일부 지역사회 연구의 44.4% [13], 43.2% [20], 22.5%

[12]와 브라질의 경우 17.1% [11]인 것과는 차이를 보였다. 본 연구에서 낙상 후 병원치료를 받은 경우는 69.5%로, 2017년의 노인실태조사 자료의 64.9% [23]에 비해서는 증가하였다. 노인실태조사에서는 낙상 후 손상에 대한 조사를 포함하고 있지 않아 손상 정도를 알기는 어려우나 노인 낙상 후 75.7%에서 신체손상이 있었으나 이 중 56.8%만이 낙상 후 진단 및 치료를 받았다[24]. 신체 손상으로는 30%~50% 이상에서 찰과상 등이 있고 근육통 및 염좌 등이 20% 이상[20,21,24] 있었으며, 골절, 두개 기저부 골절과 작은 경막하 혈종 등 수술이 필요한 경우도 30% 이상[21]인 것으로 미루어 볼 때 낙상 후 손상에 대한 적극적인 대처는 여전히 부족한 것으로 생각된다.

본 연구에서 낙상이유로는 환경적 요인이 56.5%를 차지하여 43.4%의 신체적 요인보다 더 많은 영향을 미치는 것을 확인할 수 있었다. 이는 2017년 노인실태조사 자료를 이용한 연구에서 환경적 요인과 신체적 요인이 각각 54.6%, 45.3%인 결과[16]와 유사하다. 이러한 결과는 노화로 인한 신체적 요인에 비해 개선 효과가 빠르게 나타날 수 있는 바닥 미끄러움이나 보도 또는 문턱 등의 환경적 요인이 시급히 개선되어야 함을 제시한다.

본 연구에서 단변량 분석에서 유의하게 나타난 변수를 투입하여 다중 로지스틱 회귀분석으로 분석한 결과, 경제상태 만족도, 만성질환 수, 의료 이용, 흡연, 하지근력 제한, 시력저하, 일상생활기능 제한, 주택종류가 낙상 영향요인으로 확인되었다. 이를 노인실태조사 2014년[5,10]과 2017년[16] 자료를 이용한 연구를 포함하여 선행연구와 비교하여 논의하면 다음과 같다.

본 연구결과 인구 사회학적 요인, 즉 성별, 연령, 배우자, 교육수준, 주관적 건강상태에 따른 낙상경험에는 유의한 차이가 없었다. 연령의 경우 본 연구결과와 달리 65~74세의 노인이 75세 이상의 노인에 비해 낙상률이 증가한 결과[10]가 있는 반면 85세 이상 노인에서 낙상률이 증가한 결과[5]도 있다. 동일한 2014년 노인실태조사를 이용한 연구[5,10]이나 이렇듯 상이한 결과를 보인 것은 연령을 65~74세와 75세 이상의 두 군으로 분류한 데 반해[10], 65~74세, 75~84세, 85세 이상의 세 군으로[5] 세분화한 차이에서 비롯된 결과로 생각된다. 본 연구에서도 유의한 차이를 보이지는 않으나 65~74세 군에 비해 85세 이상 군에서 낙상률이 증가하는 경향을 보여 추후 세분하여 반복연구가 필요하다. 성별, 배우자 유무에 따른 낙상률에 차이가 없는 연구결과[10,12]는 본 연구결과와 일치하나 낙상경험에 유의한 차이를 보인 변수로, 75~84세의 중기노인에서 배우자 유무[5] 및 성별[25]과 교육수준, 주관적 건강상태[10]가 있어 본 연구결과와 차이를 보였다. 또한 일부 지역사회 대상 연구에서 교육수준, 주관적 건강상태에 차이가 없는 결과[12]도 있어 연령, 배우자 유무, 교육수준과 주관적 건강상태에 따라 낙상률에 차이가 있는지를 확인하는 추후 연구가 필요하다.

건강상태 요인에서는 시력장애, 하지근력 제한, 만성질환 수, 의료이용과 일상생활기능 제한이 낙상경험에 유의한 영향요인으로 규명

되었다. 이는 만성질환의 수[5,10,11,25], 하지근력 제한, 의료 이용[5,10,11]과 일상생활기능 제한[11]이 낙상의 영향요인이라고 한 선행연구 결과와 일치한다. 또한 시력장애가 낙상의 영향요인이 아닌 연구[5,10]가 있으나 2017년 노인실태조사를 이용한 연구에서는 시력장애가 복합낙상위험군이 될 위험을 높힌다고 하여[16] 본 연구결과를 지지한다. 따라서 본 연구결과를 바탕으로 시력장애, 하지근력 제한, 일상생활기능 제한이 있고 만성질환이 있으며 최근 의료시설을 이용한 대상자를 낙상 고위험군으로 분류하고 낙상예방 중재 프로그램이 제공되어야 한다.

건강행위 중 유의한 차이가 있었던 요인은 흡연이었다. 이는 85세 이상 후기노인에서 흡연이 낙상에 유의한 영향요인으로 나타난 결과[26]와 일치하며 흡연할 경우 낙상 관련 골절 발생의 위험도가 1.47배 높아진다는 연구결과[27]는 본 연구결과를 간접적으로 지지한다. 본 연구에서 운동을 하는 군은 하지 않는 군에 비해 낙상 발생 가능성이 감소하였으나 유의한 차이를 보이지는 않았다. 노인실태조사에서는 평소 10분 이상 운동을 하는 경우를 운동군으로 분류하고 있으며, 운동의 효과에 영향을 주는 운동 지속 기간이나 운동의 종류에 대한 자료는 제공하고 있지 않는데, 운동의 효과를 파악하기에 운동의 기준 시간인 10분은 너무 짧았던 것으로 생각된다. 본 연구 결과 평소 10분 이상 운동을 하지 않는 경우도 47.7%나 되었으며 운동실천권장 수준의 운동인 주에 3회 이상, 30분 이상 운동을 한다고 각각 절반에 가까운 46.5%와 46.9%가 답하였으나 이 경우에도 비운동군에 비해 낙상 발생률에 유의한 차이는 보이지는 않았다. 최소 8주, 주 3회, 각 회당 40분 이상 균형과 하지근력 운동중재가 하지의 균형과 근력향상에 도움이 된다고 한 연구결과로 미루어 볼 때[28,29] 낙상예방을 위해서는 운동시설에 접근하기 어려운 지역사회 거주 노인에게 신체활동 및 운동의 중요성에 대한 교육과 노인의 신체상태에 적합한 운동 프로그램을 개발하여 제공할 것이 요구된다.

정신건강 요인은 경제상태 만족도에서 유의한 차이를 보였다. 이는 경제상태 만족도를 포함한 선행연구가 없어 직접 비교는 어렵지만 경제수준이 '하'인 경우에 낙상률이 유의하게 높은 결과[13]와 맥락을 같이하나 경제상태가 낙상의 위험요인이 아닌 결과[10]도 있다. 본 연구의 결과는 일반적으로 신선한 식품이나 건강식품 구입, 건강검진이나 아플 때 의료기관 이용 등 건강 추구 행위를 하기가 용이할 때 경제상태에 만족하며 평소 건강 추구 행위의 결과로 낙상 위험이 감소된 것으로 생각된다. 이러한 결과는 경제상태에 불만족하는 노인에게 낙상과 관련하여 더 많은 돌봄 서비스가 제공되어야 함을 의미한다.

환경적 요인은 주택종류에서 유의한 차이를 보였다. 낙상 위험이 단독주택에 비해 아파트는 1.69배, 오피스텔은 11.60배가 증가하였다. 단독주택에 거주하는 노인이 단독주택이 아닌 주거공간에 거주하는 노인보다 '복합낙상 위험군'에 속할 가능성이 1.31배 증가하였다고 한 결과[16]와는 차이를 보였는데 이는 본 연구에서는 주택종류를 '단독주택', '아파트', '연립·다세대 주택', '고시텔, 오피스텔, 원

룸'은 '오피스텔'로, 비거주용 건물과 판자집 비닐하우스는 '비거주용 건물'로 세분류한 반면 선행연구[17]는 단독주택과 비단독주택의 2가지로만 분류하여, 주택의 종류가 낙상에 미치는 영향을 파악하기에 제한적이었던 것으로 사료된다. 또한 본 연구에서 오피스텔이 단독주택보다 낙상위험이 증가되는 것으로 나타났는데 그 이유는 본 연구에서 오피스텔로 분류한 '고시텔, 오피스텔, 원룸'은 주택으로 분류되지 않으나, 사실상 주거용으로 이용되고 있는 준주택 시설로, 고시원의 경우엔 바닥면적 500 m² 미만의 면적 제한이 있고 오피스텔은 업무시설에 해당하며, 특히 고시원은 현재의 건축기준으로는 도저히 최소한의 삶도 만족할 수 없는 구조여서[30] 노인이 일상생활을 영위하고 많은 시간을 보내는 주거환경으로 보기에는 낙상에 취약한 점을 드러낸 결과로 생각되어진다. 본 연구에서 단변량 분석에서는 '노인이 생활하기에 편리한 구조'에서 '생활하기에 불편한 구조이다'에 비해 '생활하기에 불편한 구조는 아니지만, 노인을 배려한 설비는 없다'일 때 낙상할 가능성이 1.38배 증가하였으나 '노인이 생활하기에 편리한 구조'가 최종 낙상의 영향요인으로 규명되지는 않았다. 이는 노인을 배려한 시설이 없는 환경에 거주하는 노인이 '복합 낙상 위험군'에 속할 가능성이 노인 배려시설이 있는 환경에 거주하는 노인보다 1.88배 높다고 한 결과[16]와 일부 지역사회 노인 대상 연구에서 낙상위험 주거환경과 변기나 욕조 옆에 손잡이가 없는 것이 가장 중요한 낙상위험이라고 한 결과[14]와는 차이를 보였는데 이 문항은 노인이 조사에 응답하는 대신에 조사원이 직접 확인한 자료로, 조사원의 관점에서 노인이 생활하기에 편리함을 평가하여 실제 노인이 편리함을 인지하는 것과 차이가 있을 수 있는 것으로 생각되며 추후 노인의 관점에서 이를 확인하는 추가 연구가 필요하다. 본 연구에서 생활하기에 불편한 구조는 아니지만, 노인을 배려한 설비는 없다'는 71.4%로 나타나 노인을 위한 안전 설비는 여전히 부족하다고 할 수 있는데 노인의 안전을 위한 인테리어와 안전 설비가 갖추어질 수 있도록 국가 차원에서 노인주택에 대한 지원이 제공되어야 한다. 우리나라 지역사회 거주 노인의 95.0%가 거동에 불편이 없는 건강한 상태라면 지역에서 생활하길 원하고 있는 결과[1]를 반영하여 노인이 생활하기에 편리함과 안전을 배려한 설비를 가구 내 설치할 수 있도록 환경적 요인을 고려한 낙상예방 지원이 정책적으로 제공되어야 한다.

본 연구결과를 기반으로 낙상예방을 위한 간호중재 전략을 제시하면 다음과 같다. 경제상태 만족도는 낙상 발생에 영향을 미치는 요인이므로 가구소득이 낮아 경제상태에 만족하지 못하는 대상자에게 낙상예방 중재가 제공되어야 한다. 또한 만성질환이 있거나 최근에 의료시설을 이용한 경우, 흡연자이면서 하지근력 제한이 있고 시력저하가 있으며 일상생활기능 제한이 있는 노인을 낙상 고위험군으로 분류하고 이들에게 적합한 특성화된 낙상예방 간호중재가 제공되어야 한다. 특히 흡연은 조절 가능한 요인이므로 적극적으로 금연의 필요성에 대한 교육과 간호중재가 제공되어야 한다. 또한 하지근력 제한도

조절 가능한 요인이므로 간호사의 적극적인 개입이 필수적으로 요구된다. 하지의 근력 향상은 낙상 및 재발성 낙상에 대한 보호 요인이고 하지근력 향상이 낙상과 재낙상률을 감소시키며 하지의 신체활동 수행 저하는 지속적인 독립성 유지와 지역사회 참여 및 사회 활동에 직접적으로 영향을 미치는 요인이므로 적절히 관리되어야 한다[11].

낙상에 대한 두려움은 2020년 노인실태조사에서는 조사항목에 포함되지 않아 본 연구에서는 확인하지 못하였는데 선행연구[5,10,12]에서 낙상에 유의한 예측요인으로 제시된 만큼 다음에 시행될 노인실태조사에서는 낙상 두려움 항목이 추가되어 조사될 필요가 있다.

본 연구는 우리나라 지역사회 거주 노인을 대표하는 노인실태조사 자료를 이용하여 본 연구결과를 전 지역사회 거주 노인에게 일반화할 수 있다는 점과 노인실태조사를 이용한 선행연구에 비해 최근 이슈가 되고 있는 환경적 요인을 포함하여 다양한 영향요인을 규명하고자 시도한 것에 의의가 있다. 그러나 노인실태조사 자료는 본 연구의 주제인 낙상 관련 영향요인 분석을 위해 수집된 자료가 아니므로 운동을 비롯한 일부 변수의 경우 낙상에 영향을 미치는 요인을 분석하는 데 제한이 있다.

결론 및 제언

본 연구에서 지역사회 거주 노인의 낙상률은 6.4%였으며 가중퍼센트는 7.1%로, 이는 우리나라 지역사회에 거주하는 만 65세 이상 노인의 낙상률을 의미한다. 낙상의 영향요인으로는 경제상태 만족도, 만성질환 수, 의료 이용, 흡연, 하지근력 제한, 시력저하, 일상생활기능 제한, 주택형태가 규명되었다. 본 연구에서 규명된 변수를 기반으로 간호사는 낙상 고위험군을 조기 발견하고 선별하여 이들을 대상으로 특성화된 낙상예방 간호중재 전략을 적극적으로 개발하고 시행할 필요가 있다. 또한 본 연구에서 예방 가능한 영향요인으로 규명된 흡연 및 하지근력 제한에 대해서도 교육을 포함한 금연 중재프로그램과 하지근력을 증진시킬 수 있는 운동 및 신체활동 프로그램이 제공되어야 한다. 추후 연구를 위한 제언으로는 첫째, 앞으로 발표되는 노인실태조사 자료를 이용하여 본 연구에서 낙상의 관련요인으로 확인된 변수를 중심으로 본 연구의 분류 기준을 적용하여 지역사회 거주 노인의 낙상 영향요인 규명을 위한 반복연구가 필요하다. 둘째, 본 연구는 대규모 조사자료를 이용한 횡단연구이므로 향후 초기 낙상대상자를 대상으로 시간차를 둔 종단연구를 시행하여 인과관계를 규명하는 연구가 수행되어야 한다. 셋째, 과거에는 노인을 동일군으로 보았으나 최근 조사결과는 노인세대가 집단군별로 다양함을 보이고 있는데[1], 이러한 집단군별 특성을 파악하기 위하여 노인의 연령 또는 낙상과 재낙상 등 세심한 분류에 따른 낙상 영향요인을 규명하는 추가 연구를 제언한다.

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Authors' contribution

The author fully participated in the work performed, documented truthfully, and will make corrections herself.

Conflict of interest

No existing or potential conflict of interest relevant to this article was reported.

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Data availability

Please contact the corresponding author for data availability.

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REFERENCES

1. Ministry of Health and Welfare. 2020 National survey of older persons [Internet]. Ministry of Health and Welfare; [updated 2021; cited 2022 Sep 10]. Available from: https://data.kihasa.re.kr/kihasa/kor/contents/ContentsList.html

2. Wang L, Lee JG, Hwang JH. A big-data analysis on older adult's health and safety issues. The Journal of the Korea Contents Association. 2019;19(4):336-44. https://doi.org/10.5392/JKCA.2019.19.04.336

3. Tinetti ME, Speechley M, Ginter SF. Risk factors for falls among elderly persons living in the community. The New England Journal of Medicine. 1988;319(26):1701-7. https://doi.org/10.1056/NEJM198812293192604

4. Korea Disease Control and Prevention Agency. Injury statistics [Internet]. Korea Disease Control and Prevention Agency; 2022 Apr 19 [updated 2022 Apr 20; cited 2022 Sep 10]. Available from: https://kdca.go.kr/contents.es?mid=a20205021300

5. Park NJ, Shin YS. Predictors of accidental falls in the community-dwelling elderly by age. Journal of Korean Academy of Community Health Nursing. 2019;30(2):141-9. https://doi.org/10.12799/jkachn.2019.30.2.141

6. Hajek A, Bock JO, König HH. Psychological correlates of fear of falling: findings from the German Aging Survey. Geriatrics & Gerontology International. 2018;18(3):396-406. https://doi.org/10.1111/ggi.13190

7. Kang KS, Yang J. A study on the fear of falling, activity of daily living and quality of life for the elderly. Journal of the Korea Academia-Industrial Cooperation Society. 2017;18(7):193-9. https://doi.org/10.5762/KAIS.2017.18.7.193

8. National Health Insurance Service. Efficient management of medical expenses for the elderly in preparation for an aging society [Internet]. National Health Insurance Service; 2017 Apr 27 [cited 2017 Sep 10]. Available from: https://www.nhis.or.kr/nhis/about/wbhaec07810m01.do?mode=list&articleLimit=10&srSearchKey=&srSearchVal=%EA%B3%A0%EB%A0%B9%EC%82%AC%ED%9A%8C%EB%A5%BC+%EB%8C%80%EB%B9%84%ED%95%9C+%EB%85%B8%EC%9D%B8%EC%9D%98%EB%A3%8C%EB%B9%84+%ED%9A%A8%EC%9C%A8%EC%A0%81+%EA%B4%80%EB%A6%AC%EB%B0%A9%EC%95%88

9. Gill TM, Williams CS, Tinetti ME. Environmental hazards and the risk of nonsyncopal falls in the homes of community-living older persons. Medical Care. 2000;38(12):1174-83. https://doi.org/10.1097/00005650-200012000-00004

10. Kim M. Factors associated with falls in the elderly: based on 2014 the Korean elderly survey. The Journal of the Korea Contents Association. 2017;17(6):479-89. https://doi.org/10.5392/JKCA.2017.17.06.479

11. Souza AQ, Pegorari MS, Nascimento JS, Oliveira PB, Tavares DMDS. Incidence and predictive factors of falls in community-dwelling elderly: a longitudinal study. Ciencia & Saude Coletiva. 2019;24(9):3507-16. https://doi.org/10.1590/1413-81232018249.30512017

12. Kim YH, Yang KH, Park KS. Fall experience and risk factors for falls among the community-dwelling elderly. Journal of Muscle and Joint Health. 2013;20(2):91-101. https://

doi.org/10.5953/JMJH.2013.20.2.91

13. Lee SY, Choi YA, Kim MJ. Relationship between self-efficacy and life satisfaction among the elderly in the welfare center. Journal of Korean Leisure Science. 2020;11(2):1-10. https://doi.org/10.37408/kjls.2020.11.2.1

14. Han J, Park E. Fall risk home environment and fall experiences among community-dwelling older people. Journal of Agricultural Medicine and Community Health. 2022;47(1):27-39. https://doi.org/10.5393/JAMCH.2022.47.1.027

15. Chung CE. Complex sample design effects and inference for Korea National Health and Nutrition Examination Survey data. Korean Journal of Nutrition. 2012;45(6):600-12. https://doi.org/10.4163/kjn.2012.45.6.600

16. Kim MY. Identifying latent classes of older adults at risk for fall - based on 2017 national survey of older persons [dissertation]. Konkuk University; 2019. 60 p.

17. Sahyoun NR, Jacques PF, Dallal GE, Russell RM. Nutrition Screening Initiative Checklist may be a better awareness/educational tool than a screening one. Journal of the American Dietetic Association. 1997;97(7):760-4. https://doi.org/10.1016/S0002-8223(97)00188-0

18. Bae JN, Cho MJ. Development of the Korean version of the Geriatric Depression Scale and its short form among elderly psychiatric patients. Journal of Psychosomatic Research. 2004;57(3):297-305. https://doi.org/10.1016/j.jpsychores.2004.01.004

19. Kim TH, Jhoo JH, Park JH, Kim JL, Ryu SH, Moon SW, et al. Korean version of mini mental status examination for dementia screening and its' short form. Psychiatry Investigation. 2010;7(2):102-8. https://doi.org/10.4306/pi.2010.7.2.102

20. Han JY. The effects of drug use and residential environment on fall experience of the elderly in the community [master's thesis]. Jeju National University; 2019. 95 p.

21. Verma SK, Willetts JL, Corns HL, Marucci-Wellman HR, Lombardi DA, Courtney TK. Falls and fall-related injuries among community-dwelling adults in the United States. PLoS One. 2016;11(3):e0150939. https://doi.org/10.1371/journal.pone.0150939

22. Jia H, Lubetkin EI, DeMichele K, Stark DS, Zack MM, Thompson WW. Prevalence, risk factors, and burden of disease for falls and balance or walking problems among older adults in the U.S. Preventive Medicine. 2019;126:105737. https://doi.org/10.1016/j.ypmed.2019.05.025

23. Ministry of Health and Welfare. 2017 National survey of older persons [Internet]. Ministry of Health and Welfare; 2018 May 30 [updated 2019 Jun 5; cited 2022 Sep 10]. Available from: https://www.mohw.go.kr/react/jb/sjb030301vw.jsp?PAR_MENU_ID=03&MENU_ID=032901&page=1&CONT_SEQ=344953

24. Kim SM. The Comparison of risk factors for falls in the community-dwelling elderly. Journal of Korea Proprioceptive Neuromuscular Facilitation Association. 2016;14(2):93-103. https://doi.org/10.21598/JKPNFA.2016.14.2.93

25. Noh JW, Kim KB, Lee JH, Lee BH, Kwon YD, Lee SH. The elderly and falls: factors associated with quality of life A cross-sectional study using large-scale national data in Korea. Archives of Gerontology and Geriatrics. 2017;73:279-83. https://doi.org/10.1016/j.archger.2017.08.008

26. Kim JM, Lee MS, Song HJ. An analysis of risk factors for falls in the elderly by gender. Journal of Korean Society for Health Education and Promotion. 2008;25(2):1-18.

27. National Health Insurance Service. Risk of geriatric syndromes such as obesity, smoking, drinking, and pressure ulcers increase [Internet]. National Health Insurance Service; 2018 Dec 6 [cited 2022 Dec 10]. Available from: https://www.nhis.or.kr/nhis/together/wbhaea01600m01.do?mode=view&articleNo=127941&article.offset=0&articleLimit=10&srSearchVal=%EB%B9%84%EB%A7%8C%2C+%ED%9D%A1%EC%97%B0%2C+%EC%9D%8C%EC%A3%BC%EA%B0%80+%EB%85%B8%EC%9D%B8%EC%A6%9D%ED%9B%84%EA%B5%B0+%EC%9C%84%ED%97%98%EB%8F%84+%EB%86%92%EC%97%AC

28. Park JH, Kim HJ. Characteristics and effects of fall prevention interventions among the Korean older adults: a systematic review. Journal of Korean Gerontological Nursing. 2022;24(1):65-84. https://doi.org/10.17079/jkgn.2022.24.1.65

29. Lee SH, Bak WS, Shin G, Lee KS, Lim KC, Kim M, et al. Development of a fall-prevention exercise program for elderly people in community. Journal of Muscle and Joint Health. 2020;27(1):61-70. https://doi.org/10.5953/JMJH.2020.27.1.61

30. Jin SJ. A study on housing choice, housing satisfaction and quality of life of residents living in semi-houses in Seoul: Comparative analysis of semi-houses between studio and one-room type officetel [dissertation]. Seoul Venture University; 2020. 164 p.

발간 목적 및 간기

1. Journal of Korean Gerontological Nursing (J Korean Gerontol Nurs 노인간호학회지)은 한국노인간호학회(이하 학회)의 공식 학술지이다. 본 학회지는 빠른 고령화가 진행되고 있는 한국의 노인간호환경과 관련된 고유한 이슈를 다룬 논문을 게재함으로써, 간호교육자, 실무자 및 연구자에게 최신의 노인간호지식을 제공하고자 한다. 학회지의 범위와 출판 유형은 노인간호 교육 및 실무와 관련된 원저와 종설을 우선하며, 기타 관련된 논문은 출판위원회의 결정에 의하여 게재할 수 있다.

2. 학회지는 연 4회(2월 28일, 5월 31일, 8월 31일, 11월 30일) 발간한다.

3. 본 학회지가 폐간하는 경우, 모든 정기간행물은 국립 중앙 도서관(http://nl.go.kr)에서 열람할 수 있다.

윤리규정

1. 1) 노인간호학회지에 투고하는 논문은 다음의 윤리규정을 지켜 작성하여야 한다.
   게재 연구의 대상이 사람인 경우, 헬싱키 선언에 입각하여 환자 또는 보호자에게 연구의 목적과 연구참여 중 일어날 수 있는 정신적, 신체적 위해에 대하여 충분히 설명 하여야 하고, 이에 대한 동의를 받았음을 명시하고, 기관 윤리위원회(IRB)의 심의를 통과한 논문에 한하여 투고 하는 것을 원칙으로 한다. 단, 문헌고찰, 메타분석, 이차분석 등의 경우네는 편집위원회 심의 후 IRB 검토 및 면제 여부를 결정한다. 필요 시 편집인은 서면동의서 및 IRB승인서의 제출을 요구할 수 있다.

   2) 연구의 대상이 동물인 경우에는 실험동물의 고통과 불편을 줄이기 위하여 행한 처치를 기술하여야 한다. 실험 과정이 연구기관의 윤리위원회 규정이나 NIH Guide for the Care and Use of Laboratory Animals에 저촉되지 않았음을 명시하는 것을 원칙으로 한다.

   3) 편집위원회는 필요 시 서면동의서 및 IRB 승인서의 제출을 요구할 수 있다.

2. 다음과 같은 부정행위가 있는 논문은 게재하지 않는다.
   1) 위조: 존재하지 않는 자료나 연구결과를 만들어내고 이를 기록하거나 보고하는 행위
   2) 변조: 연구자료, 장비, 또는 과정을 조작하거나 자료나 연구결과를 변경하거나 생략하여 연구 기록이 진실에 부합하지 않게 하는 행위
   3) 표절: 정당한 권한 없이 타인의 아이디어, 과정, 결과, 또는 기록을 도용하는 행위

3. 투고 및 게재 논문은 원저에 한한다.
   1) 타 학회지에 게재되었거나 투고 중인 원고는 본 학회지에 투고할 수 없으며, 본 학회지에 게재되었거나 투고 중인 논문은 타 학술지에 게재할 수 없다.
   2) 분할 논문은 투고 및 게재하지 않는 것을 원칙으로 한다.
   3) 투고 및 게재예정인 논문의 경우, 중복게재 등의 연구윤리 위반 여부는 편집위원회에서 검토 및 심의하여 결정하고, 이미 출판된 논문이 연구윤리 위반으로 제소된 경우, 학회 윤리위원회에서 최종 심의하여 결정한다.
   4) 본 규정을 위반한 사안이 발생하면 출판윤리위원회에서 사안의 경중을 감안하여 그에 따른 조치를 결정하며 그 결과를 학회 명의로 저자에게 통보한다.

4. 논문의 심사 게재 시 회피, 제척을 원칙으로 한다.
   1) 논문 투고자가 특정한 심사자에 대하여 공정한 심사를 기대하기 어려운 객관적 사유가 있는 때에는 기피의 신청을 할 수 있으며, 이에 대하여 편집위원회는 지체없이 결정하여야 한다.
   2) 특정 심사자가 공정한 심사를 하기 어려운 사유가 있는 때에는 해당 심사를 회피할 수 있으며, 이에 대하여 편집위원회는 지체 없이 결정하여야 한다.
   3) 논문 심사자가 논문심사와 직접적인 이해관계가 있는 때에는 심사 절차에서 제척된다.

5. 발행인과 편집인은 출판윤리 위반사항을 장려하거나 허락하지 않는다.

6. 본 규정에 명시되지 않은 사항은 Committee on Publication Ethics (COPE) 가이드라인에 따른다.

이해관계 규정

이해관계는 저자(혹은 저자의 기관), 심사자나 편집자가 재정적, 개인적 관계가 있는 경우에 발생하게 되며 모든 저자는 다음과 같은 이해관계를 명시하여야 한다. (1) 재정적 관계(고용, 자문, 주식보유, 특정 단체로부터의 재정적 지원), (2) 특수관계인 공동저자: 미성년자(만 19세 이하인 자) 또는 가족 (배우자, 자녀 및 4촌 이내의 혈족)(이하 '특수관계인'이라 함)이 참여한 논문의 연구 및 논문작성에 대해 특수관계인의 명확한 기여가 있어야 한다. (3) 연구 경쟁(경쟁 관계의 저자와 전문가, 심사지의 관 계 등), (4) 지적인 관심사. 위와 같

은 이해관계는 표지나 공시사항에 반드시 포함되어야 하며 각 저자는 저작권 및 이해관계명시에 대한 동의서와 '특수관계인과 논문 공저 시사전공개 양식'에 서명함으로써 이해관계를 밝혀야 한다.

저자와 저작권(Authorship)

저자는 출판된 논문에 상당한 기여를 한 사람을 말하며 저작권은 학문적, 사회적, 재정적인 권한을 계속하여 가지게 됨을 의미한다. 연구자는 ICMJE Recommendations 2022 (https://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html)의 저자 자격 기준에 따라 아래 4가지 기준을 모두 충족하여야 한다. 1) 연구의 개념, 설계, 분석, 결과에 해석에 실질적인 기여 2) 문서의 초안을 작성하거나 학문적으로 중요한 부분에 대한 비평적 수정 3) 논문을 출판하기 전 최종본에 대한 확인 4) 연구의 정확성 또는 진실성에 관련된 문제를 적절히 조사하고 해결할 것을 보증하며 연구의 모든 부분에 책임을 지는 것에 동의. 이외의 기여자는 감사의 글에 기재한다.

원고 제출

1. 논문의 종류
   본 학회지에 게재 가능한 논문의 종류는 다음과 같다.
   1) 종설
   2) 양적연구
   3) 질적연구
   4) 기타: 개념분석, Q방법론적 연구, 메타분석 등
2. 저자 자격은 노인간호와 관련 학문 분야에 관심 있는 모든 사람이 가능하다
3. 석, 박사 학위 논문의 경우 학위논문임을 명시해야 한다.
4. 원고는 온라인으로 제출한다.
   1) 투고 전 점검사항을 확인한 후 한국노인간호학회 홈페이지 (http://gnursing.or.kr)에 접속하여 온라인논문(https://submit.jkgn.org/)을 이용하여 투고한다. 국문 원고는 한글로, 영문 원고는 HWP 혹은 MS-word로 작성한다.
   2) 원고를 투고할 때 자가점검사항과 저작권 이양동의서를 투고 시스템 내에서 입력한다.
5. 투고된 논문은 유사도 검사를 실시하여 표절여부를 심사한다. 투고된 논문의 논문 유사도가 높은 경우, 게재를 거부하거나 수정요청을 할 수 있다.
6. 본 투고규정에 부합되지 않는 원고는 접수하지 않으며 접수된 논문은 특별한 사유 없이 저자를 바꾸거나, 추가 또는 제외할 수 없다.
7. 원고 투고 시에 소정의 투고료를 납부해야 한다(입금계좌 번호는 온라인 논문투고시스템에서 확인).

원고 작성

■ 일반사항

1. 학회지에 투고하는 원고는 국문 또는 영문으로 작성하고 초록을 반드시 포함하되, 국문원고의 초록, 표, 그림, 참고문헌은 영문으로 작성한다.
2. 원고의 구성은 표지, 영문초록, 본문, 참고문헌, 표 혹은 그림의 순으로 하며, 각각은 별도의 페이지로 한다.
3. 표지는 다음의 순서로 기재한다.
   1) 제목을 1회 기재한다.
   2) 제 1저자와 교신저자 및 공동저자를 구분하여 표기한다. 첫 번째 표기되는 저자가 제 1저자이며, 공동저자는 그 다음에 표기한다.
   3) 전체 저자의 국문 및 영문 성명, 소속, 직위를 기재한다.
   4) 교신저자의 성명, 주소, 우편번호, 전화번호, Fax번호, E-mail 주소를 국문과 영문으로 표기한다.
   5) 연구방법(연구설계)을 기재한다.
   6) 참고문헌의 수(30개 이하)를 기재한다.
   7) 영문 초록의 단어 수 (250개 이내)를 기재한다.
   8) 주요 용어(key word)를 5개 이내로 기재하며, 가능한 영문 주요어와 동일하게 기재한다.
   9) 모든 저자의 ORCID ID를 기재한다. ORCID가입은 https://orcid.org/를 참조한다.
   10) 공시사항: Authors' contributions, Conflict of interest, Funding, Data availability, Acknowledgements에 대하여 영문으로 기술한다.

4. 영문 초록은 250단어 이내(제목과 저자명을 제외하고)로 작성한다.
5. 본문의 첫 페이지는 상단에 주요 용어를 기재한다. 제목을 기재하되, 저자명은 생략하고 각 페이지에 번호를 기재한다.
6. 국문 원고는 A4크기 용지에 한글(.hwp)로 작성하고, 여백주기(머리말, 꼬리말 포함)는 위쪽 30 mm, 아래쪽 25 mm, 왼쪽 25 mm, 오른쪽 25 mm로 주며, 서체는 신명조, 글자 크기는 10포인트, 줄 간격은 200%로 작성한다.
7. 초록이나 본문에 약어를 사용하는 경우, 처음에는 full name을 기재하고, 그 다음부터 약어를 사용한다. 예: 행동심리증상(Behavioral and Psychological Symptoms in Dementia, BPSD)
8. 투고 시 원고의 분량은 표지, 초록, 참고문헌, 표, 그림 및 부록을 제외하고, 글자수 6,000자 이내여야 한다.
9. 초록, 본문, 참고문헌, 표, 그림 및 부록을 포함하여 전체 페이지

가 20페이지를 넘지 않아야 한다.

10. 영문 원고는 별도의 영문 규정에 따른다.

11. 학술용어는 한국간호과학회 발행 간호학 표준용어집 및 대한의사협회 발행 의학용어집에 수록된 것을 준용한다.

12. 이상의 학회지 게재 요령 지침을 따른 원고만을 접수한다.

13. 출판 후 논문에 대한 문의 또는 오류가 발견되면, 편집담당자에게 메일을 통해 논의할 수 있다. 논문에서 오류나 실수가 발견되는 경우 사안의 경중에 따라 정오표, 본문 수정 또는 철회를 통해 수정할 수 있다.

■ 논문의 구성

1. 영문초록은 목적 (purpose), 방법 (methods), 결과 (results), 결론(conclusion)을 구분 없이 줄을 바꾸지 않고 연결하여 기술한다. 초록의 하단에 주요용어(key words)를 기재하되, MeSH (www.nlm.nih.gov/mesh/MBrowser.html)에 등재된 용어 사용을 원칙으로 한다.

2. 논문의 구성은 서론, 연구방법, 연구결과, 논의, 결론 및 제언, 참고문헌 순으로 하되 문헌고찰은 꼭 필요한 경우에만 제시한다. 질적 연구의 경우는 그 조직을 달리할 수 있다.

   1) 서론에는 연구의 필요성과 목적을 포함한다.

   2) 연구방법은 연구설계, 대상, 연구도구, 자료수집 및 분석방법 등을 순서대로 포함한다.

   · Ethic statement는 상자 안에 영문으로 기술한다.

   예:

   > **Ethic statement:** This study was approved by the Institutional Review Board (IRB) of XXXX University (IRB-201903-0002-01). Informed consent was obtained from the participants.

   · 대상자 기술

   연구대상이 사람인 경우 생물학적 성(sex)과 사회문화적 성(gender) 중 적절한 표기를 선택해서 사용해야 하며, 생물학적 성(sex)과 사회문화적 성(gender)을 결정한 방법에 대해 기술해야 한다. 단, 동물이나 세포의 경우 생물학적 성(sex)으로 명시해야 한다. 만약 연구자가 전립선암과 같이 명백한 사유없이 하나의 성(sex 또는 gender) 이나 특정 집단(인종 또는 민족)만을 대상으로 한 경우, 타당한 근거와 연구의 제한점을 명확히 기술해야 한다.

   · 논문 작성 시 EQUATOR Network (http://www.equator-network.org/home/) 또는 미국 국립보건원(http://www.nlm.nih.gov/services/research_report_guide.html) 등의 공인된 보 고지침에 따라 기술하도록 권고한다.

   3) 연구결과 및 논의는 처리된 결과를 중심으로 기술, 논의, 해석한다.

   4) 결론은 연구결과의 내용을 중복 기술하지 않으며 관찰소견의 의미를 제시한다.

3. 표, 그림, 사진 등은 별도의 페이지에 작성하고, 각 페이지에 한 개의 표, 그림, 사진만을 제시한다.

   1) 표, 그림, 사진의 제목과 내용은 영문으로 표기한다.

   2) 표 및 그림은 출판규격 내의 A4 용지 크기 이하(가로 150mm × 세로 200 mm)로 하여 흑색으로 선명하게 그리며 설명은 별도로 작성한다. 모든 선은 단선(single line)으로 하되 도표의 종선(세로줄)은 긋지 않는다.

   3) 표의 제목은 표의 상단에 위치하며, 중요한 단어의 첫 자를 대문자로 한다.

   4) 표에서 설명이 필요한 경우 각주에서 설명한다. 표에 사용한 비표준 약어는 모두 표의 하단 각 주에서 설명한다.

   예: HR = Heart rate; T = Temperature.

   5) 인적사항에서 연령, 체중, 신장의 평균치와 단위의 크기는 소수점 한 자리까지로 한다.

   예: n (%) = 79 (25.9)

   6) 소수점은 그 숫자값이 '1'을 넘을 수 있는 경우에는 소수점 앞에 0을 기입하고, '1'을 넘을 수 없는 경우에는 소수점 앞에 0을 기입하지 않는다.

   예: t = 0.26, F = 0.92

   예: $p < .001$, r = .14, R2 = .61

   7) 유의확률을 나타내는 p값은 각주를 붙이지 않고 값을 그대로 기술하는 것을 원칙으로 하며, 소수점 이하 3자리까지 기재한다(예: $p = .003$)

   p값이 .000으로 나올 경우에는 $p < .001$로 적는다.

   8) 5)~7)번 항목 외에 M ± SD, t, x^2, β, F, B, R^2, SE, OR, CI 등과 같은 통계값은 소수점 두 자리까지로 한다.

   9) 사진은 원본을 제시하는 것을 원칙으로 한다.

4. 그림과 사진 작성 원칙

   1) 그림 제목은 그림의 하단에 위치하며, 첫 자만 대문자로 한다.

   예: Figure 1. Mean responses to questions by student grade categories.

   2) 사진의 크기는 102 × 152 mm(4 × 6인치)이상이어야 하고 부득이한 경우라도 203 × 254 mm(8 × 10인치)를 넘지 않아야 한다.

   3) 동일 번호에서 2개 이상의 그림이 있는 경우, 아라비아 숫자이 후에 알파벳 글자를 기입하고 표시한다.(예: Figure 1-A, Figure 1-B)

   4) 조직표본의 현미경 사진의 경우 조직부위 명, 염색방법 및 배율을 기록한다.

   5) 그래프에 쓰이는 symbol은 ●, ■, ▲, ◆, ○, □, △, ◇의 순서로 작성한다.

■ 문헌의 인용

1. 문헌의 인용은 아래의 예를 참고하여 모두 영문으로 하되, 이 예에 포함되지 않은 경우는 Citing Medicine: The NLM (National Library of Medicine) Style Guide for Authors, Editors, and Publishers 제 2판(2007) (http://www.nlm.nih.gov/citingmedicine)을 참고한다.
2. 본문 내에서 다른 저자가 같은 내용에서 인용될 때는 인용순서에 따라 번호를 붙인다.
3. 본문에 문헌을 인용한 경우 문헌인용 순서에 따라 숫자로 괄호 [ ] 안에 기입한다.
4. 한 참고문헌이 본문에서 계속 인용될 경우 같은 번호를 사용한다.
5. 동시에 여러 개의 번호가 들어갈 경우에는 ','로 구분하고, 연속된 번호를 기입하는 경우에는 '-'로 표시한다.
  예: 스트레스 관리 [1], 간호중재 [2,3], 중환자 간호 [4-6]

■ 참고문헌목록

1. 참고문헌은 모두 영어로 표기한다.
2. 본문에 인용된 문헌은 반드시 참고문헌 목록에 포함되어야 한다.
3. 일반연구의 경우 참고문헌 수는 30개 이하로 하고 본문번호 순서에 따라 번호를 기입하여 나열한다. 단, 체계적 문헌고찰, 구조모형 등 다수의 문헌이 요구되는 연구는 참고문헌 개수를 제한하지 않는다.
4. 디지털 학술정보의 용이한 활용, 검색의 효율성 도모, 인용 활성화를 위해 DOI (Digital Object Identifier)를 서지사항 마지막 부분에 기재한다.
  http://www.crossref.org에서 DOI 번호로 문헌을 검색할 수 있다.

1. 정기간행물

- 논문 제목의 처음 글자와 고유명사 이외는 소문자로 기입하고, 부제의 처음 글자는 소문자로 기입한다.
- 학술지명의 단어마다 첫 자를 대문자로 표기하고, 학술지명은 full name을 그대로 기입한다.
- 처음 페이지는 완전한 숫자를, 끝 페이지는 앞부분의 중복되는 숫자를 생략하여 표기한다.

1) 학술지
  - 저자명. 논문명. 학술지명. 출판연도;권(호):시작페이지-마지막 페이지. DOI 순으로 기재한다.
    예: 저자가 6인 이하인 경우
  - 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):140-6. https://doi.org/10.1111/j.1442-2018.2006.00271.x
    예: 저자가 7인 이상인 경우
  - 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):72-5. https://doi.org/10.1016/j.nedt.2010.03.019

2) 출판 중인 학술지의 논문
  - 저자명. 논문명. 학술지명. Forthcoming. 지면 출간예정연월일. 순으로 기재한다.
    예: 지면 출간일을 아는 경우
  - Heale R, Dickieson P, Carter L, Wenghofer EF. Nurse practitioners' perceptions of interprofessional team functioning with implications for nurse managers. Journal of Nursing Management. Forthcoming 2013 May 9.
    예: 지면 출간일을 모르는 경우
  - 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.

3) 잡지기사
  저자. 잡지기사명. 잡지명. 연도 날짜:페이지. 순으로 기재 한다.
  예: Rutan C. Creating healthy habits in children. Parish Nurse Newsletter. 2012 May 15:5-6.

4) 신문기사
  기자. 기사명. 신문명. 연도 날짜;Sect. 란. 순으로 기재한다.
  예: Cho C-u. Stem cell windpipe gives Korean toddler new life. The Korea Herald. 2013 May 2;Sect. 01.

2. 저서

1) 단행본
  - 저자. 도서명. 판차사항. 출판도시: 출판사; 출판연도. 페이지 수 p. 순으로 기재한다.
    예: Peate I. The student's guide to becoming a nurse. 2nd ed. Chichester WS: John Wiley & Sons; 2012. 660 p.
    예: Min KA, Kim CG. Nursing management. Jeonju: Knowledge & Future; 2012. 202 p.

2) 편저
- 편저자, editor(s). 서명. 출판지: 출판사; 연도. 순으로 기재 한다.
예: Curley MAQ, Moloney-Harmon PA, editors. Critical care nursing of infants and children. Philadelphia, PA: W.B. Saunders Co.; 2001.

3) 단행본 내의 장(chapter)
(1) Chapter of unedited book
저자. 제목. 판차사항. 출판도시: 출판사; 출판연도. 장(chapter), 장(chapter)제목; 페이지(chapter).
예: Speroff, Leon; Fritz, Marc A. Clinical gynecologic endocrinology and infertility. 7th ed. Philadelphia: Lippincott Williams & Wilkins; c2005. Chapter 29, Endometriosis; p. 1103-33.

(2) 편집된 책 내의 chapter (edited book)
장(chapter) 저자. 장(chapter) 제목. In: 편저자, editor(s). 서명. 판차사항. 출판도시: 출판사; 출판연도. p. 페이지. 순으로 기재한다.
예: Sobell LC, Sobell MB. Alcohol consumption measures. In: Allen JP, Wilson VB, editors. Assessing alcohol problems: A guide for clinicians and researchers. 2nd ed. Bethesda (MD): National Institute on Alcohol Abuse and Alcoholism (US); 2003. p. 75-99.

4) 저자나 편집자가 없는 경우
서명. 판차사항. 출판지:출판사; 연도. 순으로 기재한다.
예: Resumes for Nursing Careers. New York, NY: Mc-Graw Hill Professional; 2007.

5) 백과사전, 사전
(편)저자. 사전명. 판차사항. 출판지: 출판사; 연도. 순으로 기재한다(편저자의 경우 기재방식에 유의해서 작성).
예: Snodgrass, Mary Ellen. Historical encyclopedia of nursing. Darby, PA: Diane Publishing Company; 2004.
예: Fitzpatrick JJ, Wallace M, editors. Encyclopedia of nursing research. 3rd ed. New York, NY: Springer Publishing Company; 2012.

6) 번역된 책
원저자. 번역서명. 판차사항. 역자, translator(s). 출판지: 출판사; 연도. 페이지수 p. 순으로 기재한다.
예: Stein E. Anorectal and colon diseases: Textbook and color atlas of proctology. 1st Engl. ed. Burgdorf WH, translator. Berlin: Springer; c2003. 522 p.

3. 연구보고서

- 저자. 보고서 제목. 보고서 유형. 출판지: 기관 (대학); 출판일. 보고서 번호. 순으로 기재한다.
예: Perio MA, Brueck SE, Mueller CA. Evaluation of 2009 pandemic influenza A (H1N1) virus exposure among internal medicine housestaff and fellows. Health Hazard Evaluation Report. Salt Lake City, Utah: University of Utah School of Medicine; 2010 Oct. Report No. HETA 2009-0206-3117.

4. 학위논문

- 학위논문은 가급적 인용하지 않도록 하며, 단 필요한 경우 전체 인용문헌의 10%를 넘지 않는다.
- 저자. 논문명: 부제 [학위 유형]. [소재지]: 수여기관명; 수여일자. 페이지 수 p. 순으로 기재한다.

1) 박사학위 논문
예: Jin HY. A study on the analysis of risk factors and characteristics for nosocomial infection in intensive cure unit [dissertation]. [Seoul]: Yonsei University; 2005. 276 p.

2) 석사학위 논문
예: Kim JS. A study on fatigue, stress and burnout of pregnancy nurses [master's thesis]. [Gwangju]: Chonnam National University; 2012. 111 p.

5. 학술회의나 심포지엄의 자료(Proceedings)

- 저자. 발표자료명: 부제. In: 편집자, editor(s). 모음집명. 학술회의명; 학술회의일자; 개최지. 발행지: 출판사; 출판연도. p. 페이지수. 순으로 기재한다.
예: 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. 937 p.
예: Bryar R. The primary health care workforce development road-map. In: Bigbee J, editor. The public health nursing contribution to primary health care. Proceedings

of the 3rd International Public Health Nursing Conference; 2013 Aug 25-27; Seoul, Korea. Seoul (Korea): Peter Lang; 2004. p. 241-55.

6. Web 자원

1) 전자저널

• 저자. 논문명. 연속간행물명 [자료유형]. 출판일 [인용일자]; 권 (호): 페이지수. Available from: URL 순으로 기재한다.

예: Wilcox LS. 2010 life tables for Korea. Biological Procedures Online [Internet]. 2005 Nov [cited 2007 Jan 5]; 8(1):194- 215. Available from: http://kostat.go.kr/portal/korea/kor_nw/3/index.board?bmode＝read&aSeq＝252533

2) Web 자료

• 저자. 제목[자료유형].출판지: 출판사; 출판일[update 날짜; 인용 일자]. Available from: URL

예: Statistics Korea. 2014 household financial welfare survey [Internet]. Daejeon: Statistics Korea; 2014 November 14 [updated 2014 Nov 14; cited 2016 May 10]. Available from: http://kostat.go.kr/portal/korea/kor_nw/3/index.board?bmode＝read&aSeq＝332019

예: Hooper JF. Psychiatry & the Law: Forensic Psychiatric Resource Page [Internet]. Tuscaloosa (AL): University of Alabama, Department of Psychiatry and Neurology; 1999 Jan 1 [updated 2006 Jul 8; cited 2007 Feb 23]. Available from: http://bama.ua.edu/~jhooper/

7. 이차 자료에서의 인용

• 이차 자료는 일차 자료를 찾을 수 없는 불가피한 상황에서만 사용 하고, 일차자료에서 인용되었음을 참고문헌에 밝힌다.

예: Gordis E. Relapse and craving: A commentary. Alcohol Alert. 1989;6:3. Cited by Mason BJ, Kocsis JH, Ritvo EC, Cutler RB. A double-blind, placebo controlled trial of desipramine for primary alcohol dependence stratified on the presence or absence of major depression. Journal of the American Medical Association. 1996;275: 761-7.

■ 논문 심사

1. 투고된 원고의 1차 심사는 이중맹검법을 사용하여 3인의 심사위 원이 심사하며 심사결과 '수정 후 게재'로 판정한 논문은 1인의 출 판위원이 최종 심사를 한다. 석사학위 논문과 박사학위 논문은 심 사를 받은 후 게재할 수 있다. 심사에 관한 세부사항은 별도의 규 정에 따른다.
2. 원고채택 여부는 논문심사위원 및 출판위원회에서 결정한다. 채 택된 논문의 게재 순서는 최종 원고 완성일자와 접수된 순서를 감 안하여 출판위원회에서 정한다. 출판에 관한 세부사항은 별도의 규정에 따른다.
3. 게재논문 인쇄의 교정은 저자가 하며, 게재료, 특수 조판대, 별책 대, DOI 부여비는 본 학회 규정에 따라 저자가 부담 한다. 특정 논문 심사에 대하여 별도의 심사료를 부과할 수 있다.
4. 심사 결과에 이의가 있을 경우 대표저자는 심사 결과를 통보 받은 후 60일 이내에 이의를 제기할 수 있다. 편집위원장은 이의가 제기 된 논문을 재심하여 결과를 대표저자에게 통보 할 의무를 가진다.

부 칙

1. 이 규정은 한국노인간호학회 이사회의 인준을 받은 날로부터 시행한다.
2. 이 규정은 2001년 12월부터 시행한다.
3. 이 규정은 2004년 4월부터 시행한다.
4. 이 규정은 2007년 6월부터 시행한다.
5. 이 규정은 2009년 12월부터 시행한다.
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13. 이 규정은 2014년 12월부터 시행한다.
14. 이 규정은 2015년 1월부터 시행한다.
15. 이 규정은 2015년 5월부터 시행한다.
16. 이 규정은 2016년 1월부터 시행한다.
17. 이 규정은 2016년 9월부터 시행한다.
18. 이 규정은 2017년 5월부터 시행한다.
19. 이 규정은 2019년 2월부터 시행한다.

20. 이 규정은 2019년 5월부터 시행한다.
21. 이 규정은 2019년 11월부터 시행한다.
22. 이 규정은 2020년 1월부터 시행한다.
23. 이 규정은 2020년 3월부터 시행한다.
24. 이 규정은 2021년 9월부터 시행한다.
25. 이 규정은 2022년 8월부터 시행한다.
26. 이 규정은 2023년 8월부터 시행한다

논문을 투고하실 때는 반드시 다음의 사항들을 검토하셔서 □에 ∨로 표기하십시오.
투고 시 논문과 저자점검사항을 함께 보내시기 바랍니다.

□ 이 논문은 중복투고 논문이 아니며, 노인간호학회지 윤리규정을 준수함
□ 논문 1부   □ 저자점검사항   □ 저작권 이양동의서

[겉표지]
□ 제목, 논문의 종류, 공시사항(연구비 지원 등), 주요어, 저자의 논문에 대한 기여도 기재
□ 저자: 모든 저자의 성명, 소속(직장), 직위를 한글과 영문으로 기재
□ 저자: 모든 저자의 ORCID ID 기재
□ 교신저자: 성명, 주소, 우편번호, 전화번호, FAX 번호, e-mail 주소를 한글과 영문으로 기재

[기본]
□ A4, 10 point   □ 줄간격 200%   □ 쪽번호   □ 전체원고의 투고규정 준수
□ 초록, 참고문헌, 표나 그림을 제외한 원고의 글자수 3,000~3,500자 이내
□ 초록, 본문, 참고문헌, 표나 그림을 포함한 전체 페이지 20쪽 이하
□ 논문파일에 저자 인적사항 삭제
□ 연구대상자에 대한 윤리적 고려 관련 기술

[영문초록]
□ 250 단어 이내
□ Purpose, Methods, Results, Conclusion의 소제목 하에 구성
□ 영문 주요어: MeSH에 등재된 용어를 원칙으로 5개 이내

[결론]
□ 연구목적과 연관하여 최종 결론만을 간략히 기술함
□ 연구방법이나 연구결과를 반복 기술하지 않음

[참고문헌]
□ Original article의 경우 총 30개 이내
□ 학위논문은 전체 10% 이내
□ 잡지명은 full name으로 기술
□ 투고규정 준수

[표 및 그림]
□ 표, 그림에 대한 투고 규정 준수   □ 약자 설명은 도표 밑에 기술 □ 수치가 본문의 내용과 일치하고 오자가 없음   □ 영문으로 표기

이상과 같은 투고 규정을 준수하지 않은 경우 투고한 논문의 반송을 허락합니다.

제1저자 또는 책임저자   (서명)

저작권 이양 및 이해관계 명시에 대한 동의서

1. 저작권 이양

본 논문이 노인간호학회지에 출간될 경우 그 저작권을 한국노인간호학회에 이양합니다. 이에 노인간호학회지는 해당 논문에 대한 저작권과 디지털 자료에 대한 전송권을 갖게 됩니다.

저자는 저작권 이외의 모든 권한 즉, 특허신청이나 향후 논문을 작성하는데 있어 본 논문의 일부 혹은 전부를 사용하는 권한을 소유합니다. 저자는 서면허가를 받으면 다른 논문에 본 논문의 자료를 사용할 수 있습니다. 본 논문의 모든 저자는 본 논문에 실제적이고 지적인 공헌을 했으며 논문의 내용에대해 공적인 책임을 공유합니다. 또한 본 논문은 과거에 출판된 적이 없으며 현재 다른 학술지에 제출 되었거나 제출할 계획이 없습니다.

2. 이해관계 명시

본 논문의 저자(들)은 연구와 관련된 재정적 관계(연구비 수혜, 고용, 주식보유, 강연료나 자문료, 물질적 지원 등)와 개인적 이해관계(겸직, 이익 경쟁, 지적 재산권 경쟁 등)가 있는 것을 모두 명시하였습니다.

20 년 월 일

논문제목: _____

저 자:

제1저자 _____ 서명	제2저자 _____ 서명
제3저자 _____ 서명	제4저자 _____ 서명
제5저자 _____ 서명	제6저자 _____ 서명
제7저자 _____ 서명	제8저자 _____ 서명

* 본 동의서에는 원고에 기술된 순서대로 모든 저자의 서명이 있어야 합니다.

제 1 조   (목적) 본 규정은 한국노인간호학회 회칙 제 9조 7항 학회임원의 임무규정에 따라 구성한 출판 위원회(이하 위원회라 한다)의 운영에 관한 사항을 규정함을 목적으로 한다.

제 2 조   (구성 및 임기) 본 위원회는 위원장 1인, 부위원장 1인을 포함하여 10인 내외의 위원을 두며 위원의 임기는 2년으로 하고, 연임할 수 있다.

   1. 1인의 영문초록교정위원을 둔다.

   2. 위원장 소속대학에 편집간사를 둔다.

제 3 조   (절차) 위원회의 위원장은 한국노인간호학회 실행이사 중에서 호선하며, 위원장은 소관위원회 위원을 추천하여 이사회의 인준을 받는다.

제 4 조   (업무) 위원회는 학회지 질적 수준 향상을 위하여 다음의 사항을 검토, 결정하고 위원장은 그 결과를 이사회에 보고한다.

   1. 학회지 발간에 관한 사항

   (1) 편집에 관한 사항

   (2) 접수된 원고의 심사와 게재여부의 결정

   (3) 게재료의 결정

   2. 학술 자료의 발간

   (1) 편집 및 출판에 관한 사항

   3. 회원의 워크숍에 관한 사항

   (1) 출판위원 및 심사위원의 워크숍

   (2) 회원의 논문작성 능력 향상을 위한 워크숍

   4. 학술지의 평가에 관한 사항

   (1) 학술지 등재 및 평가

   5. 출판관련 규정의 정기적 검토

   6. 심사위원의 선정과 관리

   (1) 논문심사를 위해서는 일정 인원의 심사위원을 위촉하되 출판위원장은 심사위원장이된다.

   심사위원 선정기준과 절차는 별도의 규정에 따른다.

   (2) 위원회는 논문 심사 규정에 의거하여 논문심사 절차를 관리한다.

   7. 기타 이사회에서 회부된 사항의 연구심의 및 결정

부 칙   1. 이 규정은 한국노인간호학회 이사회의 인준을 받은 날로부터 시행한다.

   2. 이 규정은 2007년 6월부터 시행한다.

   3. 이 규정은 2012년 1월부터 시행한다.

   4. 이 규정은 2015년 1월부터 시행한다.

   5. 이 규정은 2019년 1월부터 시행한다.

1. (자격) 논문심사위원은 다음의 기준에 의거하여 선정한다.
   □ 간호학 또는 관련 전공분야의 박사학위 소지자
   □ 대학교수 또는 그와 동등한 논문 심사 능력이 있다고 인정된 자
   □ 각 분야에 대해 최신지견을 갖춘 자
   단, 위의 자격을 충족하지 못한 자 중에서 본 학회지의 논문 심사를 위해 필요하다고 인정되는 경우 출판위원장의 추천에 의하여 이사회 결의를 거쳐 심사위원으로 위촉할 수 있다.

2. (선정) 논문심사위원의 선정에서 세부 전공영역별, 개념별, 연구방법별, 지역별 안배를 고려한다.

3. (정원) 논문심사위원 수는 영문심사위원 및 영문교정위원을 포함하여 최소 30명 이상으로 한다.

4. (절차) 전국 간호대학 또는 간호학과 교수 중 논문심사위원 기준에 적합한 위원을 출판위원장이 추천하면 출판위원회에서 심의, 선정하여 실행위원회의 인준을 거쳐 학회장이 선정된 위원을 위촉한다.

5. (임기) 논문심사위원의 임기는 2년으로 하며, 연임할 수 있다.

6. (특별심사위원) 논문의 주개념이 매우 독특하여, 보다 전문적인 심사가 필요하다고 인정될 경우에는 출판위원회에서 임의로 특별심사위원을 지정하여 의뢰할 수 있다.

7. (영문논문심사위원) 영문으로 작성된 논문심사를 위해 일정 수의 영문논문심사위원을 두며 국문심사위원을 겸할 수 있다. 위촉절차와 임기는 국문논문심사위원과 같다.

1. 한국노인간호학회 회칙 본회 출판위원회 규정 제 4조 6항에 따라 노인간호학회지에 투고된 논문의 심사를 위하여 본 규정을 둔다.
2. 논문의 심사 및 채택은 본 규정에 따른다.
3. 논문의 연구 개념이 노인간호학 영역과 관련된 경우 게재가능하다.
4. 논문은 간호학 연구 보고서를 원저에 한하여 심사하며 간호학 석사 및 박사 학위논문은 심사하고 게재할 수 있다.
5. 투고자격과 투고요령에 부합되지 않는 원고는 접수하지 않는다.
6. 논문 1편당 심사위원은 3인으로 하며, 심사위원은 편집위원장이 온라인으로 선정한다.
7. 각 논문의 심사위원은 공개하지 않는다.
8. 영문교정위원은 별도로 두며 심사위원은 출판위원회에서 위촉한다.
9. 영문초록의 심사는 일차적으로 심사위원이 검토하며, 영어를 모국어로 사용하는 자 또는 간호학 전공 외국학위 소지자에게 의뢰한다.
10. 논문은 양적 연구, 질적 연구, 개념분석, 종설, Q 방법론 평가 기준 양식에 의거하여 심사한다.
11. 심사결과는 심사총평 및 심사평가 세부 내용으로 작성하고 우수논문, 게재가능, 수정 후 게재가능 및 게재불가로 판정한다.
    가. '게재가능'으로 판정된 논문은 교정 없이 채택한다.
    나. '수정 후 게재'로 판정된 논문은 심사위원이 지적한 사항을 저자가 수정한 후 심사위원이나 혹은 출판위원이 최종 심사 후 이를 확인하고 채택한다.
    다. '수정 후 재심'로 판정된 논문은 심사위원이 지적한 사항을 저자가 수정한 후 심사위원이 다시 심사하여 채택 여부를 결정한다.
    라. '게재불가'의 판정기준은 논문의 내용이 다음 중 어느 한 항에 해당되는 것으로 인정될 경우에 한한다.
        (1) 연구주제가 독창적이지 않거나 간호학적 의의가 결여되는 경우
        (2) 이미 발표된 타인의 연구 내용을 표절한 경우
        (3) 연구결과가 신뢰성이나 타당성이 결여되거나 뚜렷하지 않은 경우
        (4) 대폭적인 수정을 하여도 게재가 불가능하다고 판단되는 경우
        (5) 심사 결과에서 '매우 부족하다'로 평가된 항목이 30%이상인 경우
        (6) 본 학회지의 윤리규정 및 기타의 연구 윤리를 위반한 경우
        (7) 기타(심사위원 및 출판위원이 타당한 게재불가 사유를 제시해야 함)
    마. (6)의 윤리규정 위반 여부는 출판위원회에서 심의 결정한다.
    바. 윤리규정에 위반하여 게재불가 판정을 받은 원고에 대하여 저자에게 소명기회를 부여할 수 있다.
12. 3인의 심사위원 중 2인이 '게재불가'로 판정하였을 경우에는 게재할 수 없다.
13. 심사내용은 저자 이외의 사람에게는 공표하지 않는다.
14. 심사위원은 온라인상으로 논문심사를 실시하며 심사평가지, 본문수정사항을 포함한 심사결과를 기록한다. 일정 기일이 지나도 심사결과를 기록하지 않을 경우, 심사를 포기하는 것으로 간주하고 출판위원장은 다른 심사 위원에게 심사를 의뢰한다.
15. 저자가 수정된 원고를 지시된 날짜까지 제출하지 못하는 경우에는 게재를 다음 호로 연기하거나 포기하는 것으로 간주한다.
16. 저자가 수정한 원고를 심사위원의 수정요청일로부터 1개월 이후까지 제출하지 못하는 경우에는 특별한 요청이 없는 한 저자회수로 간주한다.

부칙
1. 이 규정은 한국노인간호학회 이사회의 인준을 받는 날로부터 시행한다.
2. 이 규정은 2007년 6월부터 시행한다.
3. 이 규정은 2012년 1월부터 시행한다.
4. 이 규정은 2013년 3월부터 시행한다.
5. 이 규정은 2019년 2월부터 시행한다.

1. 논문이 온라인으로 접수되면 출판위원회에서 먼저 투고자격과 학회지 투고요령에 합당한지를 확인한 후 출판 위원장 명의로 투고자에게 접수되었음을 통보한다.

2. 접수된 논문은 출판위원장이 온라인으로 논문 1편당 논문의 주개념 및 연구방법론에 합당한 3명의 심사위원을 선정한다.

3. 심사위원은 다음의 논문심사지침에 따라 온라인상으로 논문심사를 실시한다.
   1) 선정된 심사위원은 해당 논문과 이해관계가 없어야 한다.
   2) 논문심사결과는 수령 후 10일 이내에 기록한다.
   3) 심사평가지 해당란에 표시하고, 본문수정 및 보완 사항은 온라인상에 구체적으로 기록한다.
   4) 심사 시 투고요령을 참조하여 투고규정에 맞는지 엄격하게 심사한다.
   5) 심사 시 심사위원간의 상호의견 교환이 필요하다면 출판위원장에게 연락한다.
   6) 심사한 사실에 대하여는 어떠한 경우에도 비밀을 유지한다.

4. 저자는 수정한 논문과 수정표를 심사위원 별로 정리하여 10일 이내에 온라인으로 제출한다. 수정내용은 다음과 같은 형식으로 일목요연하게 정리한다.

심사내용	답변 및 수정 내용

5. 최종 수정한 논문이 제출되면 편집위원장에 의해 선임된 편집위원은 저자가 심사위원의 지적사항에 따라 충실히 수정하였는지의 여부를 심의한다. 심사위원의 지적사항에 대한 수정이 미비한 경우, 추가 수정이 필요한 경우, 투고규정에 맞지 않는 경우에는 게재를 보류하고 저자에게 재수정을 요청한다.

6. 선임된 편집위원이 해당 논문에 대한 심의를 마치면 편집위원장이 논문 게재 여부를 최종 결정한다.

JKGN
Journal of Korean Gerontological Nursing

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