

pISSN: 2384-1877
eISSN: 2383-8086
<https://www.jkgn.org>



Journal of **Korean
Gerontological
Nursing**

노인간호학회지

2024년 2월

Vol. 26 No. 1, February 2024



Korean Gerontological Nursing Society

Journal of Korean Gerontological Nursing

Vol. 26 No. 1, 1-124, February 2024

한국노인간호학회

JKGN



한국노인간호학회

Vol. 26 No. 1 February 2024

The Journal of Korean Gerontological Nursing is the official publication of the Korean Gerontological Nursing Society. It was launched in 1999. The journal is a peer reviewed and scientific journal that seeks to promote development and exchange of knowledge that is directly relevant to all spheres of health in older adults. It also seeks critical reviews and commentaries addressing conceptual, theoretical, methodological and ethical issues pertaining to gerontological nursing.

The official title of the journal is 'Journal of Korean Gerontological Nursing' and the abbreviated title is 'J Korean Gerontol Nurs.' The journal is published four times a year on February 28th, May 31th, August 31th, and November 30th. The text may be written in Korean or English. The abstracts, acknowledgements, tables, figures, and references should be written in English. The articles in this journal are indexed in the National Research Foundation of Korea (NRF) database (Korea Citation Index), the CINAHL Complete, Science Central, Google Scholar, and SCOPUS. The circulation number is 500. The Journal of Korean Gerontological Nursing is an Open Access Journal. Full text is freely available in the following URL address of the Journal: <https://www.jkgn.org>

Published on February 28, 2024

Publisher	Korean Gerontological Nursing Society
Publishing Office	The Korean Gerontological Nursing Society College of Nursing, Chungnam National University 266, Munhwa-ro, Jung-gu, Daejeon 35015, Republic of Korea Tel: +82-10-3958-4565 E-mail: kgns5779@gmail.com https://www.gnursing.or.kr
Editor-in-Chief	Dukyoo Jung, PhD, RN. College of Nursing, Ewha Womans University 52, Ewhayeodae-gil, Seodaemun-gu, Seoul 03760, Republic of Korea Tel: +82-2-3277-6693 Fax: +82-2-3277-2875 E-mail: djung@ewha.ac.kr
Printing Office	M2PI #805, 26 Sangwon 1-gil, Seongdong-gu, Seoul 04779, Republic of Korea Tel: +82-2-6966-4930 Fax: +82-2-6966-4945 E-mail: support@m2-pi.com

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*This work was supported by the Korean Federation of Science and Technology Societies (KOFST) grant funded by the Korean government.

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Editorial

- 1 Reflection on the publications in the Journal of Korean Gerontological Nursing (2014~2023)
Hyejin Kim, Leeho Yoo, Dukyoo Jung

Review Articles

- 4 Constipation among Korean older adults in long-term care facilities: A scoping review
Yuseon Jeong, Dukyoo Jung, Eunju Choi
- 19 Concept analysis of end-of-life care competency of long-term care hospital nurses: Using a hybrid model
Sookyeon Son, Mi-Kyeong Jeon

Original Articles

- 31 Participation experience in self-care program for type 2 diabetes: A mixed-methods study
Mihwan Kim, Haejung Lee, Gaeun Park, Ah Reum Khang
- 43 Effects of sleep quality and physical activity measured by a Fitbit and self-rated questionnaire on the health-related quality of life in community-dwelling older adults: A cross-sectional study
Mi Ui Jeong, Yeongmi Ha
- 54 Living experiences of older patients with cancer amid the COVID-19 pandemic: A phenomenological study
Yong Hwan Hyeon, Kyoung Ja Moon
- 66 Recovery experience of older adults with COVID-19: A grounded-theory study
Hee-Sook Kim, Jae Wan Park
- 80 간호간병통합서비스병동 간호사의 섬망 간호지식과 섬망 간호 수행 자신감이 섬망 간호 수행에 미치는 영향: 횡단적 서술적 조사연구
김호영, 김수을
- 91 장기요양시설 간호종사자의 완화·생애말기 돌봄 준비도 측정도구의 한국어판 타당도와 신뢰도: 방법론적 연구
장수정, 문성미, 이나경
- 102 요양병원 노인의 죽음불안, 사회적 지지가 임종치료선택도에 미치는 영향: 서술적 단면 조사 연구
정지훈, 박희옥
- 113 심장수술 후 노인 환자의 중환자실에서의 섬망 발생률 및 위험요인: 후향적 조사연구
류정옥, 홍(손)귀령

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- 54 Living experiences of older patients with cancer amid the COVID-19 pandemic: A phenomenological study
Yong Hwan Hyeon, Kyoung Ja Moon
- 66 Recovery experience of older adults with COVID-19: A grounded-theory study
Hee-Sook Kim, Jae Wan Park
- 80 The effect of nurses' knowledge and self-confidence on delirium nursing performance of nurses in an integrated nursing and caring services ward: A cross-sectional descriptive study
Ho Yeong Kim, Su Ol Kim
- 91 Validity and reliability of Korean version of the nursing staff preparedness for palliative and end-of-life care in long-term care homes: A methodological study
Soo Jung Chang, Seongmi Moon, Na Kyoung Lee
- 102 The effects of death anxiety and social support on the preferences for care near the end of life in older adults staying at long-term care hospitals: A cross-sectional, descriptive study
Ji Hun Joung, Heeok Park
- 113 Prevalence and risk factors of delirium of old adults after cardiac surgery at the intensive care unit: A retrospective study
Jeong-Ok Ryu, Gwi-Ryung Son Hong

Reflection on the publications in the Journal of Korean Gerontological Nursing (2014~2023)

Hyejin Kim¹, Leehe Yoo², Dukyoo Jung³

¹Associate Professor, Red Cross College of Nursing, Chung-Ang University, Seoul, Korea

²Doctoral Candidate, College of Nursing, Ewha Womans University, Seoul, Korea

³Professor, College of Nursing, Ewha Womans University, Seoul, Korea

Received: February 13, 2024

Accepted: February 15, 2024

Corresponding author:

Dukyoo Jung

College of Nursing, Ewha Womans University, 52 Ewhayeodae-gil, Seodaemun-gu, Seoul 03760, Korea
TEL: +82-3277-6693

E-mail: dyjung@ewha.ac.kr

The Journal of Korean Gerontological Nursing (JKGN) is the only journal dedicated to gerontological nursing in South Korea. The journal aims to exchange information related to the current practice of gerontological nursing and strategies to improve the quality of care for the goal of older adults' wellness [1]. For the past 5 years, the journal has had two important achievements: an increase in the number of issues from three to four (approximately 10 publications per issue) yearly and being indexed in Scopus. The Korean Gerontological Nursing Society and its journal editorial team seek to promote international communication of the journal publications by publishing outstanding articles and expanding the exposure of its publications to a global audience. To discuss the journal's future directions, we reviewed the articles published in this journal from 2014 to 2023, focusing on study designs, data collection methods, participants, and topics.

The JKGN has published a total of 283 articles for the past 10 years, with 277 articles from regular issues and six articles from a special issue (mainly opinion papers regarding the integration of artificial intelligence in nursing). Over 60% of the articles were published over the past 5 years. Two articles originated from Indonesia and Japan, and four articles were written based on international collaborations. Of 277 articles published in regular issues, 180 are observational studies, 23 interventional studies, 29 qualitative studies, 22 literature reviews, 19 methodological studies, and four others (Q methodology and mixed-methods).

Approximately 77% of the observational studies employed a cross-sectional design, whereas the rest are secondary analyses of existing data. Self-reported survey was the most frequently reported data collection method in cross-sectional studies. For secondary data analysis, authors often used the data from the Korean National Survey on the Elderly (n = 8), the Korea National Health and Nutrition Examination Survey (n = 4), the Long-Term Care Insurance database and surveys (n = 4), and the Korean Longitudinal Study of Aging (n = 3). Of 23 interventional studies, 18 employed a non-equivalent control group pretest-posttest design, three with a randomized-controlled trial design, and two with a one-group pretest-posttest design; most of these studies collected data via self-reported survey (n = 17).

Of 29 qualitative studies, phenomenological approaches account for 41.4%, qualitative description for 20.7%, and photovoice or text analysis of written responses to open-ended questions in the survey for 6.9%. Nine articles do not state specific qualitative methodologies. The predominant method to collect data for qualitative studies was interviews (n = 28). Twenty-two articles written

based on a review of the literature consist of the following: concept analysis ($n = 9$), narrative reviews ($n = 4$), systematic reviews with or without meta-analysis ($n = 3$), meta-analysis ($n = 1$), integrative review ($n = 1$), qualitative meta-synthesis ($n = 2$), and text network analysis ($n = 2$). Methodological articles reported instrument/scale development and/or validation ($n = 14$), intervention development and/or validation ($n = 2$), and competency or guideline development ($n = 3$). In methodological studies, data were collected through one or more of the following methods: self-reported survey, observation, literature, and expert reviews.

Regarding study settings, 122 studies were conducted in community settings, 46 in long-term care hospitals, 38 in nursing homes, 34 in secondary and tertiary hospitals, 13 in two or more types of care settings, and five in schools. The remaining 19 articles do not state study settings. The most common types of study participants were patients ($n = 145$), family caregivers ($n = 25$), and nurses ($n = 52$). The majority ($n = 108$) of patients were older adults aged 65 or older. Some studies included both adults and older adults. The most common conditions or diseases that studies specified as inclusion criteria for patients or family caregivers were dementia ($n = 34$), cognitive impairment ($n = 8$), musculoskeletal disorders ($n = 8$), surgeries ($n = 7$), and cancer ($n = 6$). Moreover, seven studies focused on the sex of participants (male or female).

By reviewing the titles of 277 articles to identify topics, we categorized key concepts by the type of study participants. In studies with patients as participants, most topics were related to patient health. Specifically, behavioral health-related topics included general health behaviors ($n = 10$), self-care ($n = 5$), specific health behaviors (e.g., hand washing, vaccination, medication management; $n = 5$), and the completion of advance directives ($n = 4$). Cognitive health-related topics embraced patients' cognitive function ($n = 11$), attitudes toward certain diseases or phenomena ($n = 5$), self-efficacy ($n = 4$), ego-integrity ($n = 4$), disease-specific knowledge ($n = 2$), and health literacy ($n = 2$). Physical health-related topics comprised various physical conditions, such as gastrointestinal conditions (e.g., dysphagia, constipation, nutritional status; $n = 9$), falls ($n = 8$), pain ($n = 7$), sleep ($n = 6$), physical function ($n = 6$), activities of daily living and/or instrumental activities of daily living ($n = 5$), frailty-related conditions (e.g., sarcopenia, muscle strength; $n = 6$), and behavioral problems ($n = 3$). Psychosocial health-related topics included health-related quality of life ($n = 15$) and its related concept (e.g., life satisfaction, subjective

happiness; $n = 4$), depression ($n = 12$) and its related concept (hopelessness, suicidal ideation; $n = 2$), anger/anxiety ($n = 3$), social and family support ($n = 11$), and living alone ($n = 7$). Spiritual health-related topics consisted of acceptance of or readiness for death ($n = 2$), death anxiety ($n = 2$), and spiritual well-being ($n = 1$).

The articles focused on family caregivers addressed family caregivers' cognitive, physical, and psychosocial health as the main topics. Cognitive health-related topics embraced family caregivers' knowledge and attitudes related to certain diseases ($n = 1$), health literacy ($n = 1$), empathy ($n = 1$), resilience ($n = 1$), self-efficacy ($n = 1$), and appraisal of caregiving ($n = 2$). Physical health-related topics included sleep quality ($n = 1$) and somatization ($n = 1$) affected by caregiving. Psychosocial health-related topics were caregiving burden ($n = 5$), depression ($n = 4$), guilt ($n = 1$), and caregiving satisfaction ($n = 1$) that family caregivers experienced or felt when caring for older adults. Support for family caregivers (e.g., social support, management support; $n = 4$) also belongs to the psychosocial health of family caregivers. Besides health-related topics, others included technology-based interventions useful for family caregiving ($n = 4$), such as non-face-to-face services, social robots, and virtual reality devices.

In studies with nurses or other care staff as participants, the main topics were staff's clinical practices, interventions to help the practice, practice environment, and staff's health. In terms of clinical practices, studies addressed geriatric/gerontological nursing performance or activities ($n = 10$), person-centered care ($n = 8$), dementia/elder/emergency/end-of-life/nursing-home care ($n = 9$), advance care planning ($n = 2$), shared decision-making ($n = 1$), elder abuse ($n = 2$), and restraint use ($n = 2$). Interventions to help staff's practices included education for staff ($n = 4$), technology-based interventions (e.g., care robots; $n = 3$), assessment tools ($n = 2$), and a handoff protocol ($n = 1$). Practice environment-related topics comprised nursing practice environment ($n = 7$), nursing organizational culture ($n = 1$), work intensity ($n = 1$), and nurse staffing ($n = 1$). Among health-related topics, most were related to cognitive and psychosocial health affecting patient care. Cognitive health-related topics included staffs' professional competencies ($n = 6$), health empowerment ($n = 2$), knowledge ($n = 2$), attitudes toward aging/dementia/elder care ($n = 5$), empathy ($n = 5$), and self-leadership ($n = 2$). Psychosocial health-related topics are mainly nurse outcomes, such as care-related stress ($n = 9$), moral distress ($n = 2$), emotional labor ($n = 2$), burnout

(n = 5), job satisfaction (n = 2), and turnover intention (n = 1).

The findings of this brief review are similar to the results from a trend analysis of publications in this journal from 2010 to 2015: predominance of survey-based observational study designs, data collection using self-report questionnaires, and older adults in the community as study participants, and health-related topics [2]. Based on these two works, we suggest (a) promoting diversity in study designs, (b) recruiting dyads of older adults and family caregivers, (c) delineating the current gerontological nursing practices, and (d) publishing more international studies. First, more systematic reviews with or without meta-analysis are necessary to enhance evidence-based, gerontological nursing practice. In addition, there is an urgent need for interventional studies that develop and evaluate innovative programs (e.g., internet-of-things-based interventions) for older adults, family caregivers, and care staff. Second, as little is known about dynamics in home care and treatment decision-making between older adults and family caregivers in the Korean culture, we hope to read more articles on dyads of older adults and family caregivers in this Journal. Third, the current status of gerontological nursing practices should be delineated, focusing on structures, processes, and outcomes, to enhance the quality of care in any care setting. For example, by describing structures, processes, and outcomes of end-of-life care for older adults in community settings, deficiencies in community end-of-life care may be identified, and practical strategies to address the deficiencies may be discussed. For this assessment, it is necessary to develop indicators of quality gerontological nursing practice. Last, as the JKGN is an international journal, we hope this journal to become an active platform for international communication regarding gerontological nursing; for this, this journal needs more international studies.

ORCID

Hyejin Kim, <https://orcid.org/0000-0003-3001-8095>

Leeho Yoo, <https://orcid.org/0000-0002-9727-6235>

Dukyoo Jung, <https://orcid.org/0000-0002-0087-765X>

Authors' contribution

All work was done by HK, LY, DJ.

Conflict of interest

Dukyoo Jung and Hyejin Kim have been editorial board members of the Journal of Korean Gerontological Nursing (JKGN) since January 2021. They were not involved in the review process of this editorial. Otherwise, there was no conflict of interest.

Funding

None.

Data availability

Please contact the corresponding author for data availability.

Acknowledgements

None.

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1. Journal of Korean Gerontological Nursing. Aims and scope of Journal of Korean Gerontological Nursing online [Internet]. Journal of Korean Gerontological Nursing; 2021 Dec [cited 2024 Feb 9]. Available from: <https://www.jkgn.org/about/index.php>
2. Cha Y, Kwon J, Kwon S, Lee KH, An J. Trend analysis of research in the Journal of Korean Gerontological Nursing (2010~2015). Journal of Korean Gerontological Nursing. 2017;19(2):92-100. <https://doi.org/10.17079/jkgn.2017.19.2.92>

Constipation among Korean older adults in long-term care facilities: A scoping review

Yuseon Jeong^{1,2}, Dukyoo Jung³, Eunju Choi⁴

¹Graduate Student, College of Nursing, Ewha Womans University, Seoul, Korea

²Nurse, Ewha Womans University Mokdong Hospital, Seoul, Korea

³Professor, College of Nursing, Ewha Womans University, Seoul, Korea

⁴Doctoral Student, College of Nursing, Ewha Womans University, Seoul, Korea

Received: October 15, 2023

Revised: January 7, 2024

Accepted: February 15, 2024

Corresponding author:

Eunju Choi

College of Nursing, Ewha Womans
University, 52 Ewhayeodae-gil,
Seodaemun-gu, Seoul 03760, Korea
TEL: +82-2-2650-5348
E-mail: celestial_@naver.com

Purpose: This study synthesized the literature on constipation among Korean older adults in long-term care (LTC) facilities. **Methods:** This scoping review utilized the Joanna Briggs Institute protocol. We conducted a literature search using Cumulative Index to Nursing and Allied Health, PubMed, PsycINFO, Korean databases Research Information Sharing Service, Korean Studies Information Service System, and ScienceON. Two reviewers independently selected the studies and extracted their characteristics using pretested forms to determine the final inclusion. In total, 473 articles were identified, and eight were used for the final analysis. **Results:** Quasi-experimental design was the most common research design. Sex, age, state of mobility, admission periods, LTC classification, sleep satisfaction, depressive symptoms, diet type, daily fluid intake, and history of digestion were identified as factors related to constipation. The most widely used constipation measurement method is measuring the frequency of defecation per week. Massage is the most commonly used nursing intervention to relieve constipation. **Conclusion:** The diversification of research on constipation is necessary to improve the quality of life of older adults living in LTC facilities. Therefore, the use of reliable tools to determine constipation in older adults in LTC facilities should be expanded. There is a need to develop and implement diverse non-pharmacological interventions for older adults in LTC facilities. The results of this study are intended to serve as a basis for the development of constipation programs for Korean older adults in LTC facilities.

Keywords: Aged; Constipation; Nursing homes; Review

INTRODUCTION

Owing to the rapid aging of the population, the number of people aged 65 years and above is expected to reach 9.18 million in 2022 in Korea, or 17.5% of the total population, and is expected to reach 20.6% by 2025, rapidly becoming an ultra-elderly society [1]. Consequently, the number of geriatric conditions, such as dementia and chronic diseases, is increasing [2], and the number of cases in which older adults need to rely on others to perform activities of daily living is increasing, leading to an increase in the use of long-term care (LTC) facilities to

support the older adults [3]. After the introduction of the LTC insurance system for older adults, the number of residents in LTC facilities in Korea increased from 66,715 in 2008 [4] to 216,784 in 2022 [5], and the number is expected to increase further due to the increase in social support for older adults' care [6].

Institutionalized older adults often suffer from numerous chronic conditions such as dementia, and circulatory, musculoskeletal, and endocrine diseases, which can lead to a decline in physical and cognitive functions and reduced independence in daily living [7]. In addition to this decrease in activity, envi-

ronmental changes and social isolation caused by institutional living can increase depression, leading to digestive dysfunction [8], and an increase in the prevalence of constipation in older adults living in institutions. Furthermore, the risk of constipation increases because the cost of meals in LTC settings can make it difficult to consistently provide fruits and dairy products, such as milk, which are high in vitamins and minerals, to meet the recommended intake of essential nutrients [9]. The prevalence of constipation in institutionalized older adults has been reported to be 37% in men and 51% in women [10] compared to 20% in community-dwelling older adults [11], suggesting that a large number of institutionalized older adults suffer from constipation.

Inappropriately managed constipation increases the risk of developing complications such as fecal impaction and bowel obstruction, leading to economic burdens such as reduced quality of life and increased healthcare costs [12]. Constipation can also negatively impact the daily well-being and health of institutionalized older adults. This highlights the importance of managing constipation to improve the health and quality of life of institutionalized older adults, thus a careful review of the current research on constipation in institutionalized older adults is crucial.

The prevalence of constipation in older adults is 18.9% globally [13], whereas that in institutionalized older adults is as high as 71.8% [14]. Due to their high morbidity and vulnerability, overseas LTC facilities spend copious amount of money and time on constipation-related nursing activities [15]. Research on constipation in institutionalized older adults has been ongoing since the 1980s, which includes descriptive [16], intervention [17,18], and validation studies [19] on the application of self-reported constipation measures developed for community-dwelling and institutionalized older adults. Some intervention studies use randomized controlled trials [20–22]. Studies using a variety of research methods, such as a systematic review of non-pharmacological interventions in 2020, are conducted according to the needs of constipation research in institutionalized older adults [23].

However, an analysis of nursing services provided in Korean LTC facilities found that relatively little time was spent on excretion care compared to other physical support services, such as personal hygiene, eating, exercise, and mobility [24]. This shows that the role of nurses in facilities is mainly focused on ritualistic aspects such as meals, housing, and basic life care [25], sparing little time and resources for constipation manage-

ment. Additionally, research on constipation in older adults in LTC facilities in Korea [7,26] began in the 2000s. However, previous research on older adults in Korean LTC facilities, including community-dwelling or hospitalized older adults is lacking. Mainly descriptive surveys and quasi-experimental studies are conducted. Therefore, to identify the current status and research gaps in constipation-related studies on older adults in LTC facilities in Korea, it is necessary to systematically analyze the literature using a scoping review method.

A scoping review maps the literature on a particular topic or research area and is performed when researchers intend to identify gaps in knowledge by examining the extent of research conducted on a particular topic and to investigate key features or factors related to a particular concept [27]. In contrast to a systematic review, it determines the current state of a broad range of questions and identifies key concepts [28]. By identifying the trends and characteristics of existing research on constipation in institutionalized older adults in Korea using the scoping review method, this study intends to guide the research and development of constipation-related measurement tools and interventions for institutionalized older adults in Korea.

Thus, this study aims to identify the characteristics and research trends of constipation-related studies in institutionalized older adults in Korea using a scoping review method and provide baseline data on constipation interventions by analyzing key interventions.

METHODS

Ethic statement: This study was exemption approved by the Ewha Womans University Institutional Review Board (ewha-202309-0013-01).

1. Research Design

This study is a scoping review of the Korean literature on constipation in older adults living in LTC facilities.

2. Data search, Collection, and Selection Process

This study was conducted according to the Joanna Briggs Institute (JBI) Manual for scoping reviews [29]. The research steps include: 1) deriving a research title and questions, 2) pro-

viding selection criteria, 3) search strategy, 4) data collection and selection, 5) data extraction and analysis, and 6) presentation of the results.

1) Research Question

According to the JBI scoping review manual, participants, concepts, and context were defined as follows: Participants were older adults aged 65 and above, living in Korean LTC facilities. The concept was constipation, and the context was a domestic LTC facility. The research question for this study was: What are the trends in research on constipation among institutionalized older adults in Korea? Specifically, this study aimed to determine the factors associated with constipation in institutionalized older adults, how constipation is measured, and what interventions are related to constipation.

2) Inclusion and Exclusion Criteria

The selection criteria for this study were as follows: (1) study participants were older adults aged 65 or older admitted to an LTC facility for older adults as facility benefit providers under Article 31 of the Long-Term Care Insurance Act; (2) the study was related to constipation; and (3) the study was conducted on Korean older adults. The exclusion criteria were as follows:

(1) studies in which the full text was not available, and (2) dissertations published in academic journals.

3) Search Strategy

The literature review was not restricted by the year of publication to ensure a broad understanding of the topic and to search for literature published up to August 25, 2023. The search databases were selected based on the Core, Standard, and Ideal model developed by the US National Library of Medicine, and international databases were used to include domestic studies submitted abroad. The international databases Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and PsycINFO and the Korean databases Research Information Sharing Service (RISS), Korean Studies Information Service System (KISS), and ScienceON were used to search the literature, and a few articles were searched manually.

This was a scoping review of studies on constipation among older adults in LTC facilities in Korea. The search terms were set based on participants (P), concept (C), and context (C). When searching in domestic and international databases, we used a combination of the following terms: (a) participant-re-

lated terms: “aged,” “older adults,” “older persons,” “older people,” “nursing home patients,” “elderly people,” “geriatric,” “aging,” “older,” “elder,” “elderly,” and “senior”; (b) concept-related terms: “constipation,” “bowel obstruction,” “intestinal obstruction,” “ileus,” “intestinal movement,” “intestinal hypomotility,” “bowel hypomotility,” “bowel irregularity,” and “fecal impaction”; and (c) context-related terms: “residential facilities,” “long term care,” “nursing home,” “nursing facility,” “residential care,” and “institutionalized.” Also, MeSH terms, CINAHL headings, and text words were used as search terms, and the Boolean operator AND/OR and cut search function were applied to increase the sensitivity and specificity of the search ([Supplementary Material 1](#)).

4) Study Selection

Data were selected according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews guidelines [30]. A total of 473 articles were retrieved from domestic and international databases, including 27 from RISS, six from KISS, 22 from ScienceON, 169 from CINAHL, 203 from PubMed, 45 from PsychINFO, and one from a handwritten source. After excluding 105 duplicates, 368 articles were independently reviewed by two researchers according to the inclusion and exclusion criteria. After excluding 348 articles that did not meet the inclusion criteria regarding participants, concepts, and contexts by reviewing titles and abstracts, 20 articles were initially selected. After reviewing the 20 articles by applying the same criteria and process as the initial inclusion and exclusion criteria, 12 articles were excluded, and a total of eight articles were selected. No additional articles were added as a result of footnote search ([Figure 1](#)). All article selection processes were conducted independently by two researchers and were peer-reviewed to ensure that the final selection of articles was consistent.

3. Data Extraction and Analysis

The two researchers (YJ and EC) constructed an analysis framework using Microsoft Excel sheets in advance and independently extracted data from the literature to standardize the data extraction format and check for consistency. According to the standardized extraction format, authors, year of publication, journal, purpose of the study, study subjects, type of study, research method, intervention content, measurement method, and main results were extracted, and constipation-re-

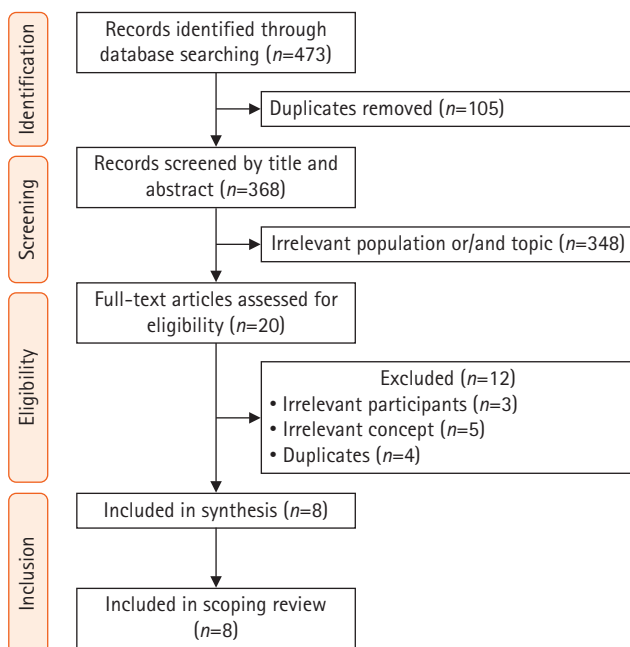


Figure 1. Flow chart of the selection process.

lated factors and intervention-related characteristics were analyzed.

RESULTS

1. General Characteristics of the Literature

The general characteristics of the eight articles selected for this study are listed (Table 1). Among the eight selected articles, the publication years were between 2006 and 2022, with three articles (37.5%) [A1,A3,A4] during 2006~2010, four articles (50.0%) [A2,A5,A6,A8] during 2011~2015, and one article (12.5%) [A7] in 2022, with the largest number of articles published in 2011~2015. The analyzed articles included one (12.5%) [A7] from journals listed in both Science Citation Index and SCOPUS, one (12.5%) [A6] from SCOPUS, one (12.5%) [A1] from journals listed in both the Korean Citation Index (KCI) and SCOPUS, one (12.5%) [A5] from KCI, three (37.5%) [A2,A4,A8] from Korean Citation Index candidate, and one (12.5%) [A3] from other thesis. The research methods included two descriptive survey studies (25.0%) [A1,A2], five quasi-experimental studies (62.5%) [A3-A7], and one experimental study (12.5%) [A8], with quasi-experimental studies being the most common. Descriptive studies [A1,A2] were conducted in 2008 and 2011, respectively. Quasi-experimental

Table 1. Characteristics of Included Literature (N=8)

Variable	Category	n (%)
Publication year	2006~2010	3 (37.5)
	2011~2015	4 (50.0)
	2016~2020	0 (0)
	2021~	1 (12.5)
Type of studies	Thesis	1 (12.5)
	Journal article	7 (87.5)
Journal status	SCI and SCOPUS	1 (12.5)
	SCOPUS	1 (12.5)
	KCI and SCOPUS	1 (12.5)
	KCI	1 (12.5)
	KCIC	3 (37.5)
	Not available (thesis)	1 (12.5)
Research methods	Descriptive	2 (25.0)
	Quasi-experimental	5 (62.5)
	Experimental	1 (12.5)
Academic field	Nursing	7 (87.5)
	Physical therapy	1 (12.5)

KCI=Korean Citation Index; KCIC=Korean Citation Index candidate; SCI=Science Citation Index.

studies [A3-A7] were conducted continuously from 2006 to 2022, but a randomized controlled trial [A8] was only attempted in 2009. Based on the authors' information, the field of study was mainly nursing with seven articles (87.5%) [A1-A5,A7,A8] and one article (12.5%) [A6] in the field of physical therapy.

2. Overview

For the content analysis, we divided the articles included in this study into article number, author name and year of publication, study objectives, study subjects, measures used to assess constipation, main results, constipation-related factors (general characteristics, health-related factors, diet-related factors), and intervention characteristics (type, method, target, session, intervention time per session, intervention frequency, intervention duration, intervention provider), and results are shown in Table 2~4 (Appendix 1) [11,31-37].

3. Study Characteristics

1) Key Findings

In the two descriptive studies included in this review that examined the prevalence and factors influencing constipation in institutionalized older adults, several older adults took laxatives to relieve constipation and had irregular bowel habits. Lee and

Table 2. Summary of Included Literature (N=8)

No.	Study methods	Author (year)	Study aims	Population	Constipation measurement methods					Key findings
					CAS	BSS	Eton scale	BFAF of defecation	Characteristics related to defecation*	
A1	Descriptive	Lee and Sung (2008) [11]	Identify factors affecting the constipation of the elderly at nursing homes	184 Institutionalized elderly -Constipation (n=90) -Non-constipation (n=94)	○			○	○	<ul style="list-style-type: none">• Elderly people who suffered from a disease and had a low level of sleep satisfaction were more likely to be constipated than those who did not have a disease.• The group with constipation had irregular bowel habits and lower frequency of defecation than the group without constipation.• Constipation is more common in elderly people who take laxatives, and if they are constipated before entering a nursing home, they are more likely to be constipated.• Factors affecting constipation among elderly people in nursing homes were sex, sleep satisfaction, and depressive symptoms.• The constipation rate was 29.3%, the elderly had irregular bowel habit was 73.7%.• The most common symptoms associated with defecation were incomplete evacuation at 25.5%.• The 25.2% of the elderly were administered laxatives.• The cause of constipation was lack of exercise in 35.1%.• High risk of constipation was 1.1%, moderate risk was 15.1%, and mild risk was 44.2% respectively.• Risk of constipation showed significantly differences according to age, admission periods, long-term care classification and daily fluid intake.• State of mobility, long-term care classification, sex, digestants and type of diet were explained 63% of risk of constipation.
A2		Park et al. (2011) [32]	Determine actual state and risk of constipation in the institutionalized elderly	365 Institutionalized elderly			○ (modified)	○	○	<ul style="list-style-type: none">• The constipation rate was 29.3%, the elderly had irregular bowel habit was 73.7%.• The most common symptoms associated with defecation were incomplete evacuation at 25.5%.• The 25.2% of the elderly were administered laxatives.• The cause of constipation was lack of exercise in 35.1%.• High risk of constipation was 1.1%, moderate risk was 15.1%, and mild risk was 44.2% respectively.• Risk of constipation showed significantly differences according to age, admission periods, long-term care classification and daily fluid intake.• State of mobility, long-term care classification, sex, digestants and type of diet were explained 63% of risk of constipation.

(Continued to the next page)

Table 2. Continued

No.	Study methods	Author (year)	Study aims	Population	Constipation measurement methods					Key findings
					CAS	BSS	Eton scale	BFAF	Frequency of defecation	
A3	Quasi-experimental	Song (2006) [31]	Evaluate the effect of abdominal massage and ROM exercise of lower extremity on the constipation for institutionalized elderly	28 Institutionalized elderly women -exp. (n=13) -cont. (n=15)	○				○	<ul style="list-style-type: none">Decreased activity due to physical disability, systemic disease, and drugs contribute to constipation.The exp. group that received abdominal massage and lower extremity ROM exercise had a higher frequency of defecation and a lower degree of constipation than the cont group that did not receive them.
A4		Shim (2008) [33]	Verify the effects of sea tangle pellet (fiber supplements) on the constipation of institutionalized elderly	46 Institutionalized elderly -exp. (n=24) -cont. (n=22)		○ (modified)			○	○ <ul style="list-style-type: none">The exp. group had a significant improvement in defecation frequency, straining, abdominal discomfort/pain and change in symptoms compared to those in the cont. group.There was no significant difference in the change in stool form between the exp. and cont. groups depending on the treatment period.
A5		Kim et al. (2014) [34]	Provide evidence for the effects of meridian acupressure on relieving and preventing constipation in the institutionalized elderly	31 Institutionalized elderly -exp. (n=16) -cont. (n=15)		○			○	<ul style="list-style-type: none">The frequency of defecation per week and BSS scores of the exp. and cont. group performed meridian acupressure verified by repeated-measures analysis of variance revealed that interaction existed between the availability of meridian acupressure and the measurement point.
A6		Wang et al. (2015) [35]	Examine the effects of SSP therapy on elderly persons' chronic constipation	30 Institutionalized elderly who cannot walk independently due to declining physical functions -exp. (SSP) (n=10) -exp. (acupuncture) (n=10) -cont. (n=10)	○	○		○	○	○ <ul style="list-style-type: none">The SSP and acupuncture groups showed significant improvement, based on the CAS and the BFAF, compared with the cont. group.

(Continued to the next page)

Table 2. Continued

No.	Study methods	Author (year)	Study aims	Population	Constipation measurement methods					Key findings
					CAS	BSS	Eton scale	BFAF	Frequency of defecation	
A7		Kang et al. (2022) [36]	Investigate the effects of foot massage using aromatic oils on sleep quality and constipation among older adult residents of nursing facilities	38 Institutionalized elderly aged 70 years -exp. (n=18) -cont. (n=20)	○				○	<ul style="list-style-type: none">• The frequency of defecation was significantly higher in the exp. group than in the cont. group.• The CAS scores decreased in the exp. group as compared to the cont. group.
A8	Experimental	Hong and Gu (2015) [37]	Investigate the effect of abdominal massage on relieving constipation of the institutionalized elderly	15 Institutionalized elderly -exp. (n=15) -cont. (n=15)		○			○	○ <ul style="list-style-type: none">• There was no significant difference in the change of stool form between the exp. and cont. groups.• The exp. group that received abdominal massage increased the frequency of defecation per week, decreased the time required for defecation and partially reduced symptoms associated with defecation compared to the cont. group that did not receive abdominal massage.

*Associated symptoms, habit of defecation time required for defecation; [†]Relief methods, cause of constipation, constipation before admission; BFAF=Bowel Function Assessment Form; BSS=Bristol Stool Scale; CAS=Constipation Assessment Scale; cont.=Control; exp.=Experimental; ROM=Range of motion; SSP=Silver spike point.

Sung [11] [A1] highlighted that older adults with medical conditions were more likely to be constipated than those without medical conditions, and constipation was more prevalent before admission to a facility. Park et al. [32] [A2] reported that the risk of constipation varies according to age, admission period, LTC classification, and daily fluid intake. While sex was a

common factor associated with constipation, sleep satisfaction, and depressive symptoms [A1], the state of mobility, LTC classification, digestants, and diet type [A2] were also identified as factors that may affect constipation in institutionalized older adults.

In six intervention studies on constipation, abdominal massage was used by Song [31] [A3] and Hong and Gu [37] [A8], and aromatic foot massage by Kang et al. [36] [A7]; all showed a significant increase in defecation frequency after massage. Moreover, Song [31] [A3] and Kang et al. [36] [A7] showed a decrease in the Constipation Assessment Scale (CAS) score, and Hong and Gu [37] [A8] showed an effect on defecation-related characteristics, confirming that massage is effective as a constipation relief program in institutionalized older adults. Kim et al. [34] [A5] highlighted that defecation frequency and the Bristol Stool Scale (BSS) score increased significantly after acupressure, whereas Wang et al. [35] [A6], showed that both the CAS and Bowel Function Assessment Form (BFAF) were significantly different after silver spike

Table 3. Associated Factors of Constipation in Descriptive Studies (N=2)

Category	Variable	n	Literature No.
General characteristics	Sex	2	A1,A2
	Age	1	A2
	History of digestants	1	A2
	Admission periods	1	A2
	Long-term care classification	1	A2
Health-related factors	State of mobility	1	A2
	Sleep satisfaction	1	A1
	Depressive symptoms	1	A1
Diet-related factors	Type of diet	1	A2
	Daily fluid intake	1	A2

Table 4. Interventions of Constipation in Intervention Studies (N=6)

Variable	Category	n (%)	Literature No.
Sample size	≤20 persons	1 (16.7)	A8
	21~40 persons	4 (66.7)	A3,A5,A6,A7
	>40 persons	1 (16.7)	A4
Intervention theme (n=7)	Massage		
	Abdominal massage	1 (14.3)	A8
	Foot massage	1 (14.3)	A7
	SSP	1 (14.3)	A6
	Meridian therapy		
	Acupressure	1 (14.3)	A5
	Acupuncture	1 (14.3)	A6
Intervention time per session (n=7)	Fiber supplements	1 (14.3)	A4
	Complex intervention	1 (14.3)	A3
Intervention time per session (n=7)	≤10 minutes	3 (42.9)	A3,A5,A8
	>10 minutes	3 (42.9)	A3,A6,A7
	N/A	1 (14.3)	A4
Intervention session (n=7)	≤10 sessions	1 (14.3)	A7
	11~20 sessions	4 (57.1)	A3,A5,A6,A8
	>20 sessions	2 (28.6)	A3,A4
Intervention frequency (n=7)	<7 per week	2 (28.6)	A6,A7
	7 per week	3 (42.9)	A3,A5,A8
	>7 per week	2 (28.6)	A3,A4
Intervention duration	≤2 weeks	3 (50.0)	A3,A5,A8
	>2 weeks	3 (50.0)	A4,A6,A7
Intervention provider (n=7)	Researcher	2 (28.6)	A3,A5
	Researcher & research assistant	2 (28.6)	A3,A8
	Researcher & licensed expert	1 (14.3)	A7
	Nurse	1 (14.3)	A4
	Nurse & licensed expert & device	1 (14.3)	A6

The A3 study performed a complex intervention, abdominal massage and range of motion exercise of lower extremity. The A6 study performed two interventions, silver spike point (SSP) and acupuncture therapy. The above studies received multiple responses.

point (SSP) electrostimulation and acupuncture. Shim [33] [A4] studied sea tangle pellets and showed that there were no significant differences in the BSS; however, significant differences existed in defecation frequency and defecation-related characteristics (Table 2).

2) Constipation Measurement Methods

Eight articles (100.0%) [A1-A8] used defecation frequency to measure constipation, followed by four articles (50.0%) [A1,A2,A4,A8] that examined defecation-related characteristics and three articles (37.5%) [A1, A2, A8] that examined the actual condition of constipation. Except for the studies by Park et al. [32] [A2] and Kang et al. [36] [A7], the frequency of defecation per week was used [A1,A3-A6,A8], and the frequency of defecation was confirmed by the facility's medical records or defecation diary. Furthermore, the included studies identified defecation-related characteristics [A1,A2,A4,A8] such as defecation habits, time required to defecate, associated symptoms, difficulty in defecating, abdominal discomfort and pain, constipation symptoms, and constipation condition [A1,A2,A8] such as constipation, constipation before admission, use of non-pharmacological therapies, use of constipation medications, and use of laxatives. The following methods were used to measure constipation: four used CAS (50.0%) [A1,A3,A6,A7], four used BSS (50.0%) [A4,A5,A6,A8], one used Eton scale (12.5%) [A2], and one used BFAF (12.5%) [A6] (Table 2).

3) Factors Associated With Constipation

In total, ten factors associated with constipation were identified in the two descriptive articles included in this review, of which five were related to general characteristics, three to health, and two to diet. In terms of frequency, the most common characteristics were sex (two articles) [A1,A2], age [A2], admission period [A2], LTC classification [A2], and history of digestion [A2]. Health-related factors included mobility status [A2], sleep satisfaction [A1], and depressive symptoms [A1], while diet-related factors, including the type of diet [A2] and daily fluid intake [A2], were identified as factors that may influence constipation in institutionalized older adults (Table 3).

4) Intervention Program Characteristics

The total number of participants in the selected articles ranged from 15 to 46, with four articles (66.7%) [A3,A5,A6,A7] having 21 to 40 participants. The number of participants in experimental and control groups ranged from 10~24,

with a relatively even distribution of 10~24 in the experimental group and 10~22 in the control group. The interventions included two massage interventions, one acupressure intervention, one fiber intervention, one intervention with SSP and acupuncture in each group, and one combined intervention study with abdominal massage and lower-extremity range of motion (ROM) exercises. The duration of each intervention session varied from 10 to 30 minutes, with three (42.9%) [A3,A5,A8] lasting within 10 minutes and three (42.9%) [A3,A6,A7] lasting more than 10 minutes. The number of intervention sessions was mainly between 11 and 20 for four articles (57.1%) [A3,A5,A6,A8], and the frequency of intervention was seven times a week in three articles (42.9%) [A3,A5,A8]. The duration of the intervention ranged from 2~4 weeks, for three articles (50%) [A3,A5,A8] lasting 2 weeks or less and three articles (50%) [A4,A6,A7] lasting more than two weeks. The intervention provider was most often the researcher [A3,A5] or a combination of the researcher and research assistant [A3,A8] (Table 4).

DISCUSSION

This study attempted to identify the research trends, characteristics of research, and suggest research directions by analyzing Korean literature on constipation in institutionalized older adults. A total of 473 articles were retrieved from six Korean and international databases and manually searched; finally, eight articles were analyzed.

Research on constipation in adults in LTC facilities in Korea began in 2006 with Song [31], who demonstrated the effect of applying abdominal massage and lower-extremity ROM exercise to relieve constipation in institutionalized older women and was most active from 2011 to 2015, with a decreasing trend after 2016. This may be because constipation in older adults is considered a common symptom of daily life or a physiological consequence of aging [26] or because it has received less research and clinical attention than other geriatric conditions [38]. However, 170,000 people aged 70 and above are reported receiving medical treatment for constipation [39], and the prevalence of constipation is higher in institutionalized older adults, who have more comorbidities and hospitalizations, take an average of 6.1 medications per day, and are more functionally dependent and frail than community-dwelling older adults [40]. Therefore, there is an urgent need for research on constipation in institutionalized older adults.

In terms of study design, two selected articles were descriptive studies, five were quasi-experimental studies, and one was a randomized controlled trial, which indicates that mainly, quasi-experimental studies were conducted to alleviate constipation in institutionalized older adults. Specifically, descriptive studies were not conducted only in 2008 and 2011 and have not been conducted since, and quasi-experimental studies have been continuously conducted since 2006; however, research on the factors affecting constipation in institutionalized older adults in Korea is lacking. In comparison, randomized controlled experimental studies have been actively conducted overseas [20-22], and a systematic review of non-pharmacological interventions for constipation in institutionalized older adults [23] has been conducted based on the accumulation of these intervention studies. This may be due to the difficulty of artificial control due to environmental constraints in Korean LTC facilities [41], which may have limited the number of randomized controlled trials. However, randomized controlled trials of constipation interventions in institutionalized older adults are required to provide strong scientific evidence of their effectiveness.

Among the measures of constipation used in the selected articles, the most commonly used was defecation frequency, and the most commonly used tools were CAS and BSS. Constipation is a symptomatic condition that varies from person to person and is not easy to define objectively, hence it is mainly diagnosed by considering the frequency of defecations, the symptoms reported during defecation, and the shape of the stool [42]. However, older adults find it difficult to recognize that they are constipated because the condition is not immediately accompanied by life-threatening or severe symptoms to make daily activities difficult [43]. Hong and Gu [37] showed that although a tool for measuring stool consistency exists, there is no tool for measuring symptoms or the time required to defecate; therefore, a scale developed by the researcher was used. Additionally, the CAS is a self-report tool that records subjective symptoms and signs of constipation [44], which is difficult to apply to institutionalized older adults, many of whom have cognitive impairment. Frank et al. [19] showed that institutionalized older adults had difficulty interpreting questionnaire items and recalling relevant information because of physical, cognitive, and emotional factors. Therefore, identifying indicators to monitor constipation in the future and developing more valid measurement tools is crucial.

The two descriptive studies included in this review [A1,A2]

found that constipation in institutionalized older adults was influenced by sex, age, mobility status, time of admission, LTC classification, sleep satisfaction, depressive symptoms, type of diet, daily fluid intake, and history of digestants. Women are more susceptible to constipation due to female hormones and childbirth, which inhibit peristalsis of the large intestine [11], and the prevalence of constipation is higher among older adults due to their limited mobility [32,37]. In particular, the risk of constipation may increase as the length of stay in the facility increases owing to the environmental conditions of the nursing home, making it difficult to exercise regularly [32]. Moreover, changes in the environment of a facility may affect sleep satisfaction and increase depression, which may increase the incidence of constipation due to decreased peristalsis and dietary intake [11]. Additionally, older adults in facilities have been reported to have insufficient fluid intake compared to the recommended fluid intake for older adults [32], and most have weakened digestive function due to long-term laxative use, which also contributes to constipation [7]. Overseas, the incidence of constipation is higher in women than in men. Factors similar to those in Korea, such as decreased daily activities, dietary habits, low fluid intake, medications [45], admission period [46], cognitive and physical disabilities, and speech disorders [14], have been reported to affect constipation. Therefore, in future studies, establishing an intervention plan for constipation that considers the general characteristics of older adults in LTC facilities is necessary.

All the interventions included in this review were non-pharmacological. Although pharmacological, non-pharmacological, and surgical methods can be used to manage constipation, trend of using complementary therapies over pharmacological and surgical treatments owing to their cost and complications is increasing [47]. Among these non-pharmacological interventions, massage interventions, such as abdominal massage and aromatic foot massage, and meridian therapy, such as acupressure and acupuncture therapy, are mainly performed. This is because they are simple yet specialized nursing interventions that can be performed by nurses alone to improve constipation in older adults in LTC facilities [23]. In particular, massage interventions were preferred as an intervention for constipation because they have relatively few side effects, do not require special tools or a lot of time, and are highly acceptable and sustainable because they can be performed by individuals as well as professionals if the practitioner receives certain training [38]. In contrast, various non-pharmacological interventions, such

as abdominal massage [22], acupressure [48], dietary fiber [49] or *Lactobacillus* intake [21,50], exercise [51], and lifestyle interventions [20] have been reported to be effective for constipation in previous studies. In Korea, these non-pharmacological interventions should be actively explored to treat constipation in institutionalized older adults and validate their effectiveness so that effective constipation-related interventions can be applied to institutionalized older adults.

The duration, sessions, frequency, and duration of interventions in the six intervention studies included in this scoping review showed that the duration of interventions ranged from 2 to 4 weeks, with daily interventions being the most common, and the number of sessions ranged from 11 to 20. The length of the interventions varied from 10 to 30 minutes per session, and the number, frequency, and duration of interventions varied. This diversity of interventions is similar to that found in a systematic review of non-pharmacological interventions for institutionalized older adults [23]. Dobbario-Sanz et al. [23] attributed the variation in interventions to differences in the definitions and criteria for constipation across studies. These differences in evaluation criteria can reduce comparability and consistency across studies; therefore, applying consistent criteria for assessing constipation and allowing for comparisons and integrated interpretation across studies would provide a clearer picture of effectiveness in practice.

Through a scoping review, this study described the general characteristics of studies related to constipation among older adults in LTC facilities in Korea, factors related to constipation, and characteristics of constipation measurement methods and intervention programs used. Notably, this study suggests trends in research related to constipation among older adults in LTC facilities and directions for future research and practice.

The limitations of this study are as follows. First, although the literature was searched using a combination of search terms, some relevant studies may not have been identified. Second, the study was limited to the literature on older adults in LTC facilities in Korea, which limits the generalizability of the findings to the constipated population as a whole, or to international older adults in nursing homes. Third, the scoping review method does not include quality of evidence assessment to ensure a comprehensive review that includes a wide range of literature, which may lead to potential bias in the literature.

CONCLUSION

This study identified research trends on constipation among older adults in LTC facilities in Korea and provided an overview of the existing literature to suggest directions for future research. Eight articles were selected, and the review showed that research on constipation began in 2006, with the most active period from 2011 to 2015. Most existing studies are quasi-experimental, and there is a lack of descriptive surveys and randomized controlled experimental studies. The factors associated with constipation in institutionalized older adults in the selected studies included sex, age, mobility status, time of admission, LTC classification, sleep satisfaction, depressive symptoms, type of diet, daily fluid intake, and digestant use. Constipation is mainly measured by the frequency of defecation, and massage is the most common nursing intervention used to relieve constipation.

Based on the results of this study, the following recommendations are made: First, it is necessary to diversify the research on frequently reported constipation problems to improve the health-related quality of life of older adults in LTC facilities. Second, a constipation measurement method that reflects the characteristics of older adults in LTC facilities is required and a valid measurement tool must be developed. Third, intervention studies for the prevention and management of constipation should be developed and tested, considering the characteristics of older adults in LTC facilities.

ORCID

Yuseon Jeong, <https://orcid.org/0009-0000-2078-2343>

Dukyoo Jung, <https://orcid.org/0000-0002-0087-765X>

Eunju Choi, <https://orcid.org/0000-0002-4136-4762>

Authors' contribution

Study conception and design acquisition - YJ, DJ, EC; Data collection - YJ, EC; Data analysis and interpretation of the data - YJ, DJ, EC; Drafting and critical revision of the manuscript - YJ, DJ, EC; Final revision - YJ, DJ, EC

Conflict of interest

Dukyoo Jung has been editor in chief of the Journal of Korean Gerontological Nursing since January 2021. She was not in-

volved in the review process of this manuscript. Otherwise, there was no conflict of interest.

Funding

None.

Data availability

Please contact the corresponding author for data availability.

Acknowledgements

This article is a master's degree thesis by the first author, Yuseon Jeong from the Ewha Womans University, Seoul, Korea.

Supplementary materials

Supplementary Material 1. Search Strategy Used in Each Database

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Appendices

Appendix 1. List of Studies Included in a Scoping Review

No.	Literature	Reference No.
A1	Lee KM, Sung KW. The factors affecting the constipation of the elderly at nursing homes. <i>Journal of Korean Academy of Community Health Nursing</i> . 2008;19(4):575-86.	11
A2	Park AJ, Lim NY, Kim YS, Song JH. Prevalence and risk of constipation among the institutionalized elderly. <i>Journal of East-West Nursing Research</i> . 2011;17(1):57-65. https://doi.org/10.14370/jewnr.2011.17.1.057	32
A3	Song YH. The effects of abdominal massage and ROM exercise of lower extremity on the constipation for institutionalized elderly [master's thesis]. Dankook University; 2006. 47 p.	31
A4	Shim HW. Effects of sea tangle pellet on constipation in institutionalized aged. <i>Journal of Korean Gerontological Nursing</i> . 2008;10(2):131-41.	33
A5	Kim MY, Kang EH, Byun EK. Effects of meridian acupressure on constipation in the institutionalized elderly. <i>The Korean Journal of Rehabilitation Nursing</i> . 2014;17(1):48-55. https://doi.org/10.7587/kjrehn.2014.48	34
A6	Wang JS, Lee SB, Park SY. The effect of SSP therapy on elderly nursing home residents' chronic constipation. <i>Journal of Physical Therapy Science</i> . 2015;27(12):3887-9. https://doi.org/10.1589/jpts.27.3887	35
A7	Kang JI, Lee EH, Kim HY. Effects of aroma foot massage on sleep quality and constipation relief among the older adults living in residential nursing facilities. <i>International Journal of Environmental Research and Public Health</i> . 2022;19(9):5567. https://doi.org/10.3390/ijerph19095567	36
A8	Hong HH, Gu MO. The effect of abdominal massage on constipation in institutionalized elderly. <i>Asia-pacific Journal of Multimedia Services Convergent with Art, Humanities, and Sociology</i> . 2015;5(1):21-36. https://doi.org/10.35873/ajmahs.2015.5.1.003	37

Concept analysis of end-of-life care competency of long-term care hospital nurses: Using a hybrid model

Sookyeon Son¹, Mi-Kyeong Jeon²

¹Adjunct Lecturer, Department of Nursing, Changwon National University, Changwon, Korea

²Associate Professor, Department of Nursing, Changwon National University, Changwon, Korea

Received: December 23, 2023

Revised: February 13, 2024

Accepted: February 15, 2024

Corresponding author:

Mi-Kyeong Jeon

Department of Nursing, Changwon National University, 20

Changwondaehak-ro, Uichang-gu,

Changwon 51140, Korea

TEL: +82-55-213-3573

E-mail: mkjeon@changwon.ac.kr

Purpose: This study identified the attributes and indicators of end-of-life care competency in long-term care hospital nurses and clarified the definition of the concept. **Methods:** The Competency Outcomes Performance Assessment model was used as a conceptual framework, and conceptual analysis was performed using the hybrid model presented by Schwartz-Barcott and Kim. In the theoretical phase, the attributes of end-of-life care competencies were explored through a literature review. In the fieldwork phase, focus group interview data were analyzed to derive the attributes of nursing competency at the end of life. In the final analysis phase, the attributes and indicators of end-of-life care competency were compared, analyzed, and integrated. **Results:** The attributes of end-of-life care competency among nurses in long-term care hospitals included comprehensive symptom management, effective communication, situational response, patient-centered care, information provision and education, resource management, demonstrating leadership, and professional development. **Conclusion:** End-of-life care competency in long-term care hospital nurses can be defined as a comprehensive set of competencies that includes symptom management, situational adaptation, effective communication, resource utilization, leadership, patient-centered care, meeting the needs of patients' families through adequate information provision and education, and enhancing individual nursing capabilities through professional development. These results can serve as a foundation for developing tools to measure end-of-life care competencies among nurses in long-term care hospitals.

Keywords: Terminal care; Clinical competence; Long-term care; Hospitals; Nurses

INTRODUCTION

End-of-life care has emerged as an important factor affecting quality of life due to the rapidly aging population, and more people are expected to need end-of-life care in long-term care settings [1]. Accordingly, many countries have prepared strategies to provide quality end-of-life care [2]. Korea announced the 2019 comprehensive plan for hospice and life-sustaining care to ensure dignified and comfortable end-of-life care [3].

The National Institute for Health and Care Excellence [4] defines end-of-life care as care for patients who are likely to die within 12 months and their families. Although it cannot be clearly determined because of the lack of scientific evidence to

support the clinical criteria that specify the end-of-life period [5], it has various meanings that reflect the period at which life ends [6]. End-of-life care can be viewed as care provided to support patients and their families in resolving physical, social, emotional, and spiritual problems during the last period of life [6]. The skills, knowledge, experience, and behaviors required to effectively provide end-of-life care are referred to as end-of-life care competency [7].

Nursing competency is a prerequisite for quality nursing care in clinical settings [8], and the knowledge, skills, and attitudes of nurses caring for end-of-life patients have a significant impact on the type of nursing care provided [9]. Griffith [2] mentioned the need to develop competencies to provide quali-

ty end-of-life care, as end-of-life care competencies are essential to maintaining and respecting the dignity and value of individuals. The actual level of end-of-life care competency has been reported to have a significant impact on patients facing death and their families [9,10]. Depending on proficiency in end-of-life care, it can influence various aspects of life, potentially leading to a deterioration in the quality of life. Therefore, nurses should possess a sufficient level of competency in end-of-life care, considering various dimensions of life, to enhance the quality of nursing and prevent a decline in the quality of life for both patients and their families. Most patients admitted to long-term care hospitals are older adults with chronic illnesses [11]. Unlike patients admitted to hospital for acute illnesses, who mostly return home following recovery, most patients admitted to long-term care hospitals never return home [12]. In another study, among 1,000 discharged patients, 425 deaths were reported in those aged 65 or older in long-term care hospitals, which is 4~5 times higher than in tertiary general hospitals and general hospitals [13]. Additionally, examining the cases of individuals aged 65 and older who passed away in 2017 revealed that, on average, they spent the last 2 years of their lives in nursing homes or long-term care hospitals [14]. They are unable to maintain independence in their daily lives for a considerable period of time, and requiring care, experiencing physical and mental difficulties until they pass away in medical institutions [15]. End-of-life care competency is considered essential for nurses working in long-term care environments, particularly in institutions where older adults are predominantly admitted [16]. Therefore, a conceptual analysis of care competency at end of life is necessary in a long-term care environment.

Research related to end-of-life care competency in Korea includes competency development studies for multidisciplinary hospice and palliative care experts and undergraduate students [12,17], and a study measuring the degree of nurses' end-of-life care competency targeting intensive care unit nurses [18]. Research has been conducted on long-term care hospital nurses [19,20]. However, no studies have focused on the competencies necessary to provide end-of-life care effectively. Therefore, the phenomenon of end-of-life care competency and its essence and attributes should be identified, and its definition be established.

Concept analysis clarifies ambiguous and confusing concepts and distinguishes similar concepts [21]. Furthermore, among the various concept analysis methods, the hybrid model

proposed by Schwartz-Barcott and Kim [22] connects theoretical analysis with empirical observations. This approach allowed for a more accurate observation of the phenomenon, enabling the examination of the importance and appropriateness of the concept in nursing practice. This facilitates the identification of interrelated concepts within a phenomenon [22]. Therefore, in this study, a hybrid model approach was used to conduct a conceptual analysis of end-of-life care competency among nurses in long-term care hospitals.

METHODS

Ethic statement: This study was approved by the Institutional Review Board (IRB) of Changwon National University (IRB No. 7001066-202205-HR-027). Informed consent was obtained from the participants.

This is a concept analysis study on the end-of-life care competency of long-term care hospital nurses using a hybrid model. The research procedure was conducted in the theoretical, fieldwork, and final analysis phases according to the concept analysis procedure of the hybrid model presented by Schwartz-Barcott and Kim [22]. In the theoretical phase, an extensive literature review was conducted focusing on the conceptual definition and attributes of end-of-life care competency. The second phase was the fieldwork phase, in which data were collected and analyzed through focus group interviews (FGI) to empirically validate the concepts analyzed in the theoretical phase through empirical observation. In the third phase, the results of the literature review conducted in the theoretical phase and data analysis results from the fieldwork phase were comprehensively compared and analyzed. This study was described in accordance with the Consolidated criteria for Reporting Qualitative research (COREQ) reporting guidelines [23].

1. Theoretical Phase

Focusing on the conceptual definition and attributes of end-of-life care competency, we first examined dictionary meanings and extensively reviewed the domestic and international literature. The search was conducted using databases such as the Korea Education and Research Information Service, Korean Information Service System, DBpia, Science On, PubMed,

and Cumulative Index to Nursing and Allied Health Literature without limitations on the year of publication. Keywords, including 'end-of-life care,' 'end-of-life nursing,' 'terminal care,' 'hospice,' 'palliative,' 'clinical competence,' 'competencies,' 'competency,' 'nursing,' were combined, and Boolean operator (AND, OR, NOT) and cut (*) searches were used. Additionally, reports from government agencies and organizations were searched using Google, and more literature was identified using Google Scholar's 'cited by' list. A manual search was conducted to identify relevant studies in the reference lists of the retrieved literature. The selection criteria were as follows: (1) nursing environments targeting adult patients, (2) literature written in Korean or English with the full text available, and (3) literature published in academic journals among degree theses. The exclusion criteria were as follows: (1) studies in which the definition or attributes of end-of-life care competency could not be confirmed, (2) studies targeting only nurses in acute hospitals, and (3) studies targeting only nurses working in community nursing settings. Consequently, 125 domestic documents and 740 international documents were searched. Of these, 64 duplicate domestic and 15 international documents were excluded, and 786 documents were selected. Moreover, 546 papers unrelated to end-of-life care and competency were excluded at the title level. The abstracts (65 excluded) and full texts (160 excluded) were reviewed sequentially, and the final 15 articles were subsequently selected. A literature review was conducted, focusing on the definitions, properties, and indicators of the concepts presented in each final selected paper.

2. Fieldwork Phase

The fieldwork phase was conducted to determine whether the attributes, indicators, and definitions derived for end-of-life care competencies are consistently observed in the practical nursing field, and identify any new attributes. During the field phase of the hybrid model, it was recommended to set up the site, negotiate, select cases, and collect data through participant observation [18]. However, participant observation was not possible due to concerns regarding the spread of COVID-19; hence, the FGI approach was used.

The data collection period was from August 4 to August 29, 2022. The study participants were eight nurses working in four different long-term care hospitals in Daejeon and Gyeong-sangnam-do, and seven advanced practice nurses in five hospice palliative care institutions in Seoul, Daejeon, Daegu, and

Gyeongbuk, selected using convenience and snowball sampling. There were a total of 15 participants. The selection criteria were that they had to have at least 3 years of total clinical experience, at least 1 year of work experience at a long-term care hospital or hospice palliative care institutions, participated in direct nursing, had experience with end-of-life care, and understand the study and agree to participate. In particular, nursing staff from long-term care hospitals were nurses who could demonstrate a good understanding of the characteristics of end-of-life patients in long-term care hospitals, and articulate their experiences candidly and actively regarding their end-of-life care competencies. The number of participants per FGI group ranged from two to four, and the interview was terminated after confirming that the data was saturated as no new topics emerged in the fifth FGI. The interviews lasted between 1 to 2 hours each. The interview schedule and location were discussed with the participants, and a location was selected where they could talk freely and comfortably according to their desired schedule, and where the confidentiality of the interview contents and the privacy of the participants could be guaranteed. The participants were also informed that they could withdraw from the study at any time without facing any consequences, the interview content would not be used for any purpose other than the purpose of the study, personal information would be kept secure, and that after a certain period of time elapsed after the data analysis, the data would be destroyed. In addition, the interview was conducted after explaining that the interview would be recorded and obtaining consent.

The interviews were conducted in an open-ended manner, starting with semi-structured questions that allowed the participant to describe their experiences of end-of-life care competency, including general characteristics. The interview questions were 'Please tell me about your experiences related to end-of-life care.'; 'What do you think end-of-life care is?'; 'What do nurses need to have when providing end-of-life care?'; 'What are some things you need to know when providing end-of-life care?'; 'What are the difficulties in providing end-of-life care?'; 'What do patients and their families need at the end of life?'; 'What do you think is the most important thing when providing end-of-life care?' During the interviews, the main content stated by the participants was noted, statements were reconfirmed based on the notes, and the researcher's understanding and interpretation were verified by the participants. The recorded data were directly transcribed verbatim

by the researcher the same day after the interview was completed. The transcribed data were shared by the two researchers and analyzed using the qualitative content analysis method proposed by Elo and Kyngäs [24]. After a meeting, the analyzed content was presented as terms used in the hybrid model, with subcategories as indicators and categories as attributes.

3. Final Analysis Phase

The attributes and indicators derived from each phase were compared and analyzed to integrate the results of the theoretical and fieldwork phases. The attributes and indicators of the care competency concept at the end-of-life for long-term care hospital nurses were confirmed, and the final results were derived.

4. Ethical Considerations

This study was approved by the Institutional Review Board (IRB) of Changwon National University University (IRB No. 7001066-202205-HR-027). Informed consent was obtained from the participants.

RESULTS

1. Theoretical Phase

1) Dictionary Meaning of End-of-Life Care Competency

In the National Institute of Korean Language Standard Korean Dictionary [25], “life” is defined as “the period of one’s lifetime as long as one is alive,” “end” is defined as “the end or concluding phase of a certain period,” “nursing” is defined as “taking care of and nursing patients or older adults who are injured or ill,” and “competency” is defined as “the ability to accomplish a task or work.” In the Oxford English Dictionary [26], “competency” is defined as “the ability to do something well and the skills required for a specific profession or particular task.” The Cancer Terms Dictionary [27] defines “End of Life care” as “treatment for individuals approaching the end of their life who have discontinued treatment aimed at curing or controlling the disease.” It involves managing pain and other symptoms to ensure patient comfort, and includes physical, emotional, social, and spiritual support for both patients and their families.

2) End-of-Life Care Competency in Adjacent Disciplines

It was confirmed that research is being conducted focusing

on interdisciplinary core competencies in adjacent disciplines, such as medicine (health care) and social welfare. Kang et al. [16] conducted a study of the minimum essential competencies required by interdisciplinary professionals in South Korea and identified 12 core competencies, specifically for nurses, considering the appropriate competencies for each occupation. Bunnell et al. [28] emphasized that all healthcare professionals involved in end-of-life care can support individuals in various situations and environments to live their remaining lives by possessing end-of-life care competencies. They also mentioned that by preparing for death, professionals could assist individuals in dying with dignity. Furthermore, they highlighted that professional practices can promote and provide patient-centered nursing through the process and communication of end-of-life care.

In social work, research has been conducted on the development and validation of end-of-life care competency assessment tools. These studies aimed to investigate differences in end-of-life care competencies based on various fields, work environments, and individual characteristics by validating assessment tools [29].

3) End-of-Life Care Competency in Nursing

In nursing, research on end-of-life care competencies has been conducted using various methods such as surveys, reviews, qualitative studies, and systematic literature reviews. White et al. [30] state that competency is required to effectively provide end-of-life care to patients. Robinson [31] states that because end-of-life care can occur in a variety of environments, nurses must have the necessary attitudes, knowledge, and skills to provide care for dying patients. Casey et al. [32] assert that making individuals as happy and comfortable as possible is the focus of end-of-life care. They highlighted the importance of knowing the individual and forming intimate relationships, which they identified as crucial factors determining the quality of end-of-life care. To provide such high-quality end-of-life care, skills of cooperation, coordination, and teamwork are required through communication and exchange among all relevant medical providers, and end-of-life care provided near the end of life and after death was considered an important competency [2,6,33].

In a domestic study, the competencies required to provide terminal patient care to improve the quality of life of terminally ill patients were divided into the areas of hospice palliative care principles, communication, individual nursing, self-management, and ethical practice, and were described as terminal pa-

tient nursing competencies [17]. Nurses in long-term care hospitals need integrated nursing competencies, including emotional and spiritual support for end-of-life patients and their families, management of physical symptoms, continuity of care, and skills in decision-making and communication, which are not limited to imminent end-of-life situations [19].

4) Attributes of End-of-Life Care Competency

By analyzing 15 documents related to end-of-life care competency, eight attributes were identified (Table 1) based on the Competency Outcomes Performance Assessment (COPA) model presented by Lenburg [34]. The first attribute was ‘assessment and intervention,’ aiming to understand and address various issues that arise during end-of-life. These attributes include management of physical symptoms including pain, integrated assessment of psychosocial, emotional, and spiritual problems, holistic individual nursing, identifying signs of imminent death, care for the dying, advance treatment plan, nursing care planning and evaluation, palliative care, bereavement care, and indicators of nursing continuity. ‘Communication’ has been identified as a fundamental attribute for providing quality end-of-life care. It includes indicators such as talking with patients and their families about dying, effective communication, communication and interaction, and appropriate documentation of communication. The attribute of ‘critical thinking’ includes indicators such as decision-making and prioritization. The attribute of ‘human care and relationships’ includes indicators such as providing ethical principles and legal standards, cultural and religious care, interpersonal relationships, and support for patients and their families. The attribute of ‘management’ includes indicators such as the physical environment and support, teamwork, and support and education for staff. ‘Leadership’ has also been identified as an attribute, with indicators such as coordination, collaboration, self-reflection and self-management, and understanding one’s role. The attribute of ‘teaching’ includes indicators such as preparing and equipping families to cope with death, educating and supporting staff, and providing information. Lastly, the attribute of ‘knowledge integration’ included integration of hospice and palliative care principles, education and research, professional knowledge, and ethical and legal issues.

2. Fieldwork Phase

During the fieldwork phase, the below nine attributes were

derived, which are shown in Table 1.

‘Symptom management for comfort’ involves a nursing process that assesses the diverse needs of patients and implements interventions to address and alleviate them, and it included indicators such as assessment of the patients and their families’ comprehension of the patient’s illness severity, evaluation and assessment of spiritual components, and holistic personalized nursing.

“I believe it’s important to be able to evaluate and assess different symptoms, also caring for terminally ill patients requires both theoretical knowledge about their condition and a set of skills to provide customized nursing care that meets individual patient needs...” (Participant 9)

‘Communication in individual nursing’ requires skills to elicit patients’ and their families’ emotions and comprehend their thoughts. Additionally, flexibility in word selection and intonation based on the patient’s situation or characteristics is crucial for effective communication. In unexpected situations, therapeutic communication techniques appropriate for the situation and subject can be employed. Developing effective communication skills with patients and their families is crucial to achieve end-of-life care goals. This involves getting to know the recipient, understanding their wishes, and building trust. In doing so, nurses can provide better care and support during this important stage of life.

“It is crucial to actively seek and understand the perspectives of the other person. Understanding an individual enables you to discern their needs, recognize desires, and formulate interventions or plans tailored to them. These skills serve as a compass for touching the person’s heart. Central to this is communication, encompassing physical, psychological, social, and spiritual dimensions, in order to learn more closely.” (Participant 4)

‘Communication between team members for continuity of nursing’ has been demonstrated as an essential competency for ensuring continuity of nursing. This proficiency plays a pivotal role in facilitating the delivery of high-quality end-of-life care that benefits patients and their families. The indicators included team member communication, information sharing, and thorough documentation.

Table 1. Attributes and Indicators of Theoretical, Fieldwork, and Integration Phases

Attributes			Indicators
Theoretical phase	Fieldwork phase	Integration phase	
Assessment and intervention	Symptom management for comfort	Comprehensive symptom management	<ul style="list-style-type: none"> • Assessment of patient and their family's comprehension of the patient's illness severity • Assessing and evaluating pain involves considering its physical, psychosocial, emotional, and spiritual aspects • Sensitive and immediate reaction to changes in status • Identifying signs of imminent death • Palliative care • Evaluation of nursing care plans and goals • Holistic individual nursing • Continuity of nursing • Advance treatment plan • Care of the dying
Communication	Communication for individual nursing Communication between team members for continuity of nursing	Effective communication	<ul style="list-style-type: none"> • Eliciting the mind • Understanding the mind • Suitable intonation and vocabulary selection, flexibility • Utilization of therapeutic communication techniques • Build trusting relationships with patients and families • Communication and information sharing among team members • Proper documentation
Critical thinking	Determining priorities according to the situation	Situational response	<ul style="list-style-type: none"> • Decision making (choices and decisions) • Appropriate judgment for the situation • Priorities for problem resolution
Human caring/relationship	Care that accompanies daily life	Patient-centered care	<ul style="list-style-type: none"> • Emotional support • Supporting the decisions of patients and their families • Encouragement and support for independent daily living • Support for patient and family (emotional, psychosocial, spiritual) • Interest, warm heart • Religious and cultural care • Family participation in care • Share daily life
Teaching	Providing information and education on uncertain situations	Information provision and education	<ul style="list-style-type: none"> • Accurate condition description • Preparing for and coping with death • Providing information for decision making • Provide information to solve decision problems • Providing information about predictable changes • A facilitator for nurturing positive relationships • Caregiver training for personalized nursing care
Management	Optimal resource utilization	Resource management	<ul style="list-style-type: none"> • Utilization of human and material resources • Teamwork • Employee support and training
Leadership	Exercise leadership aligned with the situation	Demonstrate leadership	<ul style="list-style-type: none"> • Advice from an expert • Collaboration with team members or other departments • Coordination and orchestration on opinions • Self-reflection and self-management • Understanding one's own role
Knowledge integration	Professional development to strengthen competency	Professional development	<ul style="list-style-type: none"> • Knowledge of hospice palliative care and related laws • Knowledge of end-of-life care • Providing basis for decision making • Integration of hospice and palliative care principles • Education and research • Expertise • Ethical and legal issues

“When a patient issue arises, it’s critical that team members share information quickly and accurately to ensure positive outcomes...” (Participant 14)

‘Determining priorities according to the situation’ involves determining the focus and systematically delivering nursing care in alignment with the diverse needs of patients and their families. It emphasizes decision-making, situation-appropriate judgment, and effective problem-solving.

“Prioritization plays a crucial role in end-of-life care due to the limited time available for the patient’s needs. It is necessary to determine what is urgent and what can be sacrificed or postponed in order to fulfill the patient’s requirements within that restricted span. Therefore, it is important to prioritize certain aspects to ensure optimal care. I believe that prioritizing these aspects should be the primary concern even towards the end of life.” (Participant 9)

‘Care that accompanies daily life’ entails encouraging and supporting patients to live as independently as possible while providing emotional support and attention to ensure that patients feel respected as they go through their daily routines. Consequently, sharing the details of daily lives of patients with their families and involving them in the care process are essential. Additionally, the nurses’ role in ensuring patient comfort included supporting the family’s decision-making and alleviating any difficulties they might face in deciding the course of treatment for the patient.

“Explanation, attention, and compassion are essential elements of genuine end-of-life care. Even if nobody is interested in preparing for the end while residing in the hospital, or if one is bedridden and unable to respond or comprehend, it is important to at least hold their hand and engage in conversation during rounds instead of abandoning them. In this process, a connection is gradually established, and you open up to us during both difficult and joyful moments. As trust develops, you feel comfortable sharing concerns, pains, and loneliness, allowing us to make preparations for the last moment.” (Participant 10)

Utilizing resources at the appropriate time and location improves efficiency through the division of labor and necessitates the linking and proper utilization of both human and material

resources to meet the diverse needs of the target audience.

“By fulfilling our role in connecting individuals with the relevant resources, we can significantly alleviate the pain experienced by patients and their families (omitted) Among that, our proficiency in social services and economic matters, as well as making connections, is not particularly strong. However, the social worker excels in these areas, particularly in establishing connections with entities like the city office...” (Participant 3)

Exercising leadership aligned with the situation necessitates the ability to provide expert counseling, collaborate with colleagues or other departments, manage and reconcile disparate opinions, and engage in self-reflection and self-management.

“In the midst of a crisis faced by patients and their families nearing the end of life, it is crucial to possess the ability to remain centered and provide unwavering guidance until the conclusion of their journey. In addition, it is important to possess spiritual maturity, self-awareness, and the ability to prioritize self-care.” (Participant 6)

‘Providing education and information regarding uncertain situations’ involves instructing caregivers on individualized nursing, offering a precise description of the condition to help families prepare for and handle death, providing problem-solving strategies and information on predictable changes, furnishing the necessary information for decision-making, and supporting relationships as helpers.

“As medical professionals, when a patient’s condition worsens, we may recognize signs of imminent death. However, family members often struggle to accept this reality, even when it’s apparent to them, leading to difficulties and awkward situations. It is imperative to offer comprehensive education to bridge this understanding gap, as it appears to be a crucial necessity. Ultimately, the patient’s comfort is dependent on the preparedness of their family. So in the end, to make the patient comfortable, the family must be prepared as well.” (Participant 3)

‘Professional development to strengthen competency’ involves acquiring knowledge about hospice palliative care and

related laws and end-of-life care which helps in decision-making.

“To ensure the family’s comprehension, it is essential to explain that a phenomenon present in this situation necessitates a specific intervention. Such knowledge is very important. Because you can’t just explain it to your family out of the blue. Because understanding theoretical knowledge of various symptoms is also essential.” (Participant 4)

3. Final Analysis Phase

In the final analysis phase, the data obtained during the theoretical and fieldwork phases were thoroughly compared and analyzed. Communication between team members for the continuity of nursing, newly developed in the fieldwork phase, was incorporated into effective communication. During the integration of the additional indicators identified in the field phase, a list of attributes was created to comprehensively depict competency in end-of-life care. The final analysis results showed the derivation of eight attributes and 50 indicators, including comprehensive symptom management, effective communication, situational response, patient-centered care, information provision and education, resource management, demonstration leadership, and professional development (Table 1).

Based on the results obtained from the final analysis phase, the end-of-life care competency of long-term care hospital nurses is as follows: implementing comprehensive symptom management and responsive interventions is crucial in long-term care hospitals to facilitate end-of-life care, which allows patients to live independently with human dignity in their final moments; demonstrating leadership by employing effective communication and optimal resource utilization; providing comprehensive information and education that addresses the needs of both patients and their families by actively engaging in patients’ daily lives; and ensuring professional development to strengthen individual nurses’ competency.

From a social perspective, the increase in the older population and attention to end-of-life care are significant. From the subject’s perspective, as the disease worsens, individual needs increase, dependence increases, and quality of life decreases. From the patient’s standpoint, the focus is on well-being, enhanced quality of life, and a dignified, comfortable, and serene death. From the nurses’ perspective, a positive attitude towards

death can strengthen self-competency.

DISCUSSION

The study identified the attributes of end-of-life care competency as comprehensive symptom management, effective communication, situational response, patient-centered care, resource management, demonstrating leadership, information provision and education, and professional development. The results of this study were similar to those of the research conducted by Korean Hospice Palliative Nursing Research Network et al. [17] on the palliative care competencies required of undergraduate nursing students in Korea. However, more specific attributes were identified in this study; it was observed that performing bereavement nursing, including aspects such as loss and mourning, is challenging due to work environment factors. The main disease groups among inpatients in long-term care hospitals include dementia, cerebrovascular diseases, malignant neoplasms, paralysis, and musculoskeletal disorders. Except for cancer, most of these conditions do not follow a clear progression of the disease, making it challenging to accurately predict disease deterioration or the end-of-life stage [35]. Long-term care hospital nurses are responsible for providing comprehensive care by classifying pathological changes in patients from a professional perspective and closely observing emergency situations [36]. According to Lee [37], when a patient’s condition worsens in a situation where there is no doctor on duty, nurses often have to accurately and quickly judge the patient’s condition and respond appropriately, resulting in difficulties in end-of-life care. In this study as well, the study participants reported facing such difficulties. The participants reported situations in which patients suffer due to their guardians’ sudden decision-making changes and meaningless life extension. Furthermore, their ability to cope with such situations is also important. Therefore, we would like to discuss each derived end-of-life care competency attribute as follows.

Comprehensive symptom management refers to an approach including pain and physical symptoms and mental, social, emotional, and spiritual aspects of the patient’s comfort. In studies by White et al. [30], pain management is the core of end-of-life care and is the top priority for people experiencing severe pain. However, it is an aspect of end-of-life care and requires the ability to manage pain, including physical, emotional, psychosocial, and spiritual dimensions. This finding is consistent with the results of the present study. To achieve compre-

hensive symptom management, nurses require the ability to accurately assess whether patients and their families have a precise awareness of the patient's current condition. Additionally, the ability to set nursing goals based on the needs of individuals and to provide individualized nursing care in a cyclical manner up to the evaluation stage is essential. Additionally, continuity of care can facilitate high-quality end-of-life care [38], and sensitive and immediate responses are required to identify patients at the imminent end of life.

Clinical decision-making is affected by the severity of a patient's health problems and the context of the patient's actual life [8]. Situational response was revealed as an attribute that allowed the patient to make a quick judgment according to their situation and respond according to decision-making and priorities in the event of a rapidly worsening patient's condition or a sudden unexpected situation. Soikkeli-Jalonen et al. [39] stated that it is necessary to respond according to physical conditions or various circumstances and to provide advocacy and guidance for patients so that decisions can be made when ethical issues are related to treatment.

Effective communication can strengthen trust and cooperation between patients, their families, and team members; facilitate end-of-life care; reduce the emotional pain of patients and the burden on families; and influence the quality of care [28,38]. Participants stated that failure to communicate properly could have a negative impact on the patients' and their families' ability to decide how to live the rest of their lives. Similarly, this study identified effective communication as one of the attributes that nurses providing end-of-life care must have, as it has been reported that dissatisfaction with end-of-life care may occur in the absence of clear communication [16,30].

Nursing consists of several areas, including direct nursing, focusing on "what to do" or "can you do," while caring behavior focuses on "how to do" and "how to convey" nursing practice [40]. Patient-centered care can be effectively achieved depending on the trusting relationships formed with the patient, family, and team members; knowing the person and forming a close relationship are key factors in determining the quality of end-of-life care [32]. In most cases, patients in long-term care hospitals die after living together for a long period of time rather than suddenly dying. Applying ethical principles and legal standards from a religious and cultural perspective to support patients and families, supporting patients to live their daily lives as much as possible, and providing comfort to patients by cooperating with each other in caring are important indicators

of successful end-of-life care [16].

The attributes of resource management refer to the ability to link and utilize human and material resources so that the needs of the target audience can be addressed in various ways and the ability to efficiently exercise teamwork through an appropriate division of work. Participants said that patients often experienced financial difficulties due to prolonged hospitalization or relied on religion during the dying process; therefore, it is necessary to connect them with appropriate resources to alleviate their difficulties.

Demonstrating leadership means managing oneself and patients, families, and all staff involved in end-of-life care. Long-term care hospital nurses play a pivotal role in providing end-of-life care because they have the closest relationships with patients and their families and spend more time with them than with other medical professionals [33]. Collaboration between team members and other professions is one way for effective interventions to be carried out, and all professionals must work in harmony to promote quality end-of-life care [8,16,28]. Most long-term care hospital patients remain in hospital for long periods; therefore, they need the ability to manage personal emotions and stress that arise from their relationships with patients [41]. Additionally, the desire to provide quality nursing depends on an individual; therefore, changing attitudes and beliefs about caring for end-of-life patients through self-reflection and self-management are regarded as the key to lasting behavioral change [42]. Through their experience of end-of-life care, the research participants confirmed that they naturally accepted death as a life process and strengthened their capabilities through self-reflection.

Information provision and education can improve quality of life for the remainder of one's life by providing appropriate education at the right time, to patients and their guardians, and those who provide care. Education and counseling for patients and their families can provide an opportunity to prepare for bereavement [33,39]. Additionally, it was confirmed that, when there is a problem in the relationship between a patient and their family or close acquaintances, the competency of the nurse as a facilitator is needed to maintain the patient's psychological comfort through relationship recovery. Particularly, nurses in long-term care hospitals not only provide direct and indirect nursing care but also engage in educational activities related to auxiliary staff [43]. Therefore, educational competency for nursing assistants and caregivers is necessary to effectively provide end-of-life care. Nurses in long-term care hospi-

tals are involved in caring for the daily lives of individuals and require educational competence, which aligns with previous research findings [39] emphasizing the need for such competence.

Professional development refers to the ability to integrate the necessary knowledge to effectively provide end-of-life care through education and participation in research, thereby providing the basis for the end-of-life care needed by patients and their families. It was reported that nurses felt well prepared and gained competency in their role in caring for dying patients through education, and that end-of-life patient care improved after education [2]. Therefore, support at the organizational level, and individual efforts are needed to acquire professional knowledge and qualifications related to end-of-life care.

Based on the COPA model, this study redefined the definition of end-of-life care competency by confirming the attributes and indicators of end-of-life care competency recognized by nurses in clinical settings and conducting a literature review. However, this investigation has limitations in generalizing the results, because it reviewed verifiable literature in English and Korean at the theoretical stage, and conducted convenience sampling of participants at the field stage.

CONCLUSION

This conceptual analysis study used a hybrid model. The results showed that long-term care hospitals require integrated nursing competencies to provide end-of-life care. By establishing a conceptual definition through this study, it will be possible to provide basic data for the development of a tool to measure the end-of-life care competency of hospital nurses and contribute to the development of educational programs to secure their competency.

ORCID

Sookyeon Son, <https://orcid.org/0000-0002-8950-7451>

Mi-Kyeong Jeon, <https://orcid.org/0000-0001-6730-2423>

Authors' contribution

Study conception and design acquisition - SS and MKJ; Data collection - SS; Data analysis and interpretation - SS and MKJ; Drafting and critical revision of the manuscript - SS and MKJ

Conflict of interest

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

Funding

This research was funded by convergence research financial program for instructors, graduate students and professors in 2023.

Data availability

Please contact the corresponding author for data availability.

Acknowledgements

This study is an excerpt of a part of the first author's doctoral thesis.

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Participation experience in self-care program for type 2 diabetes: A mixed-methods study

Mihwan Kim¹, Haejung Lee², Gaeun Park³, Ah Reum Khang⁴

¹Master's Student, College of Nursing, Pusan National University, Yangsan, Korea

²Professor, College of Nursing · Research Institute of Nursing Science, Pusan National University, Yangsan, Korea

³Researcher, Research Institute of Nursing Science, Pusan National University, Yangsan, Korea

⁴Professor, Division of Endocrinology and Metabolism, Department of Internal Medicine, Pusan National University Yangsan Hospital · Research Institute for Convergence of Biomedical Science and Technology, Pusan National University School of Medicine, Yangsan, Korea

Received: October 15, 2023

Revised: December 18, 2023

Accepted: February 7, 2024

Corresponding author:

Haejung Lee

College of Nursing · Research
Institute of Nursing Science, Pusan
National University, 49
Busandaehak-ro, Mulgeum-eup,
Yangsan 50612, Korea
TEL: +82-51-510-8344
E-mail: haejung@pusan.ac.kr

Purpose: This study aimed to explore the participation experiences of patients with type 2 diabetes in an Automated Personalized Self-Care program, assess the changes in self-care behavior and glycemic control, and evaluate the stages of change and readiness to change using the transtheoretical model (TTM). **Methods:** We examined 16 patients with type 2 diabetes who participated in a diabetes self-care program using a mobile application. Purposive sampling continued until data saturation. Using a mixed method study, we analyzed the participants' characteristics, self-care behavior, stage of change, and readiness to change quantitatively and analyzed the qualitative data using Elo and Kyn-gas's content analysis method. **Results:** The compliance group (CG) showed improved self-care behavior and glycemic control. In the CG, the proportion of participants in the action stage was higher in the exercise and diet domains and lower in the blood glucose testing and medication domains than in the non-compliance group (NCG). Readiness to change, motivation for health behaviors, and social motivation were higher in the CG, whereas personal motivation was higher in the NCG. In this qualitative study, three categories and 11 subcategories were identified. The findings suggest the CG regarded their experience in the program more frequently as positive, whereas the NCG perceived greater barriers to using the mobile application in the program. **Conclusion:** Based on the differences identified between the CG and NCG, TTM-based strategies are needed to facilitate the progression of NCG to the action stage.

Keywords: Diabetes mellitus, type 2; Mobile applications; Self care; Patient compliance; Transtheoretical model

INTRODUCTION

Worldwide, the prevalence of diabetes among individuals aged 20~79 years was estimated to reach 537 million in 2021 and is expected to rise to 783 million by 2045 [1]. In 2020, one in six adults (16.7%) aged 30 years or older were observed to have diabetes [2], representing a 24.3% increase in the number of patients with diabetes over a period of 5 years from 2017 to 2021 [3]. Diabetes is a chronic condition that requires continuous management to prevent complications, such as neuropathy,

nephropathy, retinopathy, foot ulcers, and cardiovascular diseases [4]. Diabetes self-care is integral to preventing complications, indicating active participation in maintaining and improving health and well-being [5]. The World Health Organization has emphasized the significance of self-care in diabetes management by incorporating a healthy diet, regular physical activity, and weight management to control the blood glucose (BG) levels [6].

Interventions utilizing mobile applications (apps) have been widely developed to promote diabetes self-care. These inter-

ventions involve the tracking of self-care behaviors and providing patients with reminders to take medications or measure their BG levels [5]. Additionally, these interventions offered recommendations based on the patients' knowledge, health status, and current self-care levels, and enabled patients to set their goals, share diaries with others, and foster empathy and connection [7]. Interventions utilizing mobile apps have demonstrated beneficial effects on self-care behaviors, BG, and hemoglobin A1c (HbA1c) levels in patients with diabetes [5,7]. However, a meta-analysis reported that 43.0% of participants did not fully participate in a mobile app intervention [8], and in a dietary self-monitoring intervention, only 13.6% of participants uploaded photos for monitoring at least once per week [9]. Some participants initially expressed willingness to participate; however, after experiencing a decline in participation, they discontinued the intervention prematurely [10]. Therefore, strategies are needed to improve the participation of patients with diabetes in mobile app interventions to maximize their effectiveness in supporting self-care.

Previous studies have explored factors related to the participation in interventions utilizing apps for patients with type 2 diabetes mellitus (T2DM). Factors, such as health status, support from healthcare providers and relatives, awareness of app usage, and understanding of disease severity, technical literacy, and internet connectivity can influence participation in these interventions [11,12]. However, some studies only included participants with excellent disease management [11] or analyzed participants who had used an app as part of the intervention group [12]. In light of this, there is a lack of research comparing the experiences of individuals with low participation in utilizing apps with those with higher participation. Comparing their experiences can provide insights into understanding patients with low participation in app usage, which is essential for devising effective strategies to enhance their participation.

Several studies have used specific models to assess and evaluate the self-care in patients with diabetes. One of these models is the transtheoretical model (TTM), which states that the readiness to change is a determining factor in participating in and maintaining health-promoting behaviors and that individuals have the potential to progress and regress throughout the stages of readiness to change [13]. Applying the TTM to assess and evaluate participants' self-care can enhance our understanding of their readiness to change and factors contributing to their low or high participation. Moreover, planning motivational strategies based on the participants' readiness to change

can contribute to progressing to the next level and improving intervention compliance [14]. In a previous study, providing a consistent intervention regardless of the participants' readiness to change their self-care behavior resulted in a decrease in intervention compliance within 6 months [15].

Participation in the intervention refers to understanding the purpose of the intervention and adhering to the plan, and compliance indicates that the participants adequately fulfilled their involvement in the intervention [10]. In this study, compliance was defined as the extent to which participants performed self-care behaviors and recorded them using an app. Those achieving a compliance rate of 80.0% or higher were categorized into the compliance group (CG), whereas those with a compliance rate below 80.0% were classified into the non-compliance group (NCG). We qualitatively and quantitatively analyzed both groups based on the TTM to assess changes in self-care behavior and glycemic control, explore the participation experience of the self-care program using a mobile app, and identify factors that influence sustained participation. Specifically, we analyzed the participants' characteristics, changes in self-care behavior and glycemic control, stage of change, and readiness to change quantitatively, and qualitatively explored participants' positive or negative experiences and barriers related to intervention participation.

METHODS

Ethic statement: This study was approved by the Institutional Review Board (IRB) of Pusan National University Yangsan Hospital (IRB No. 04-2021-052). Informed consent was obtained from the participants.

1. Study Design

This study used a mixed-methods research design to analyze the experiences of patients who participated in an app-based self-care program developed by our research team [16]. As a complementary method to qualitative analysis, a quantitative analysis was conducted to analyze the participants' characteristics, self-care behaviors, glycemic control, stage of change, and readiness to change, with a focus on confirming the results based on the qualitative findings [16]. Qualitative and quantitative data are expected to provide a comprehensive understanding and insight into contexts and meanings that may be challenging to capture through qualitative or quantitative data

alone. This study was described following the consolidated criteria for reporting qualitative research (COREQ) [17].

2. Setting and Samples

The participants were patients with T2DM from Pusan National University Yangsan Hospital who participated in an Automated Personalized Self-Care (APSC) program [18]. The inclusion criteria for the APSC program were: T2DM diagnosis, age of 40~69 years, HbA1c levels $\geq 7.0\%$ within the last 3 months, use of an Android smartphone, and the ability to walk without assistive devices [18]. The participants in this study had a minimum of 6 months of program participation, as this is generally considered the duration required for behavior change [15]. The participants who understood and agreed with the purpose and methods of the study were selected. In this study, we qualitatively analyzed the participation experience of CG and NCG to explore factors related to sustained participation, and, as a complementary method, conducted a quantitative investigation to support the qualitative research findings [16]. Therefore, the sample size was determined based on the saturation of the qualitative research data, indicating that no new information emerged.

This study included 16 participants who participated in the APSC program from January to August 2022, and none refused to participate in the interviews. Successful program execution was defined as achieving 80.0% or more of the recommended frequency in a previous study [19]. We instructed the participants to record their self-care data on the app for at least 5 days per week. Therefore, the participants who input data 4 days or more per week, which is 80.0% of the recommended frequency of app usage, were classified into the CG, whereas those who input data less than 4 days per week were classified as the NCG. The CG and NCG participants were purposively selected based on their compliance levels over the previous 6 months.

3. Measurement

1) Characteristics of Participants

The participant characteristics were measured in terms of sex, age, marital status, employment status, monthly income, duration since DM diagnosis, DM treatment method, and comorbidities.

2) Self-Care Behaviors and Glycemic Control

The self-care behaviors were measured using diabetes self-care behaviors and physical activity. Diabetes self-care behaviors were measured using the Korean version of the Revised Summary of Diabetes Self-Care Activities (SDSCA) [20]. The scores were calculated as the frequency of self-care activities per week, with higher scores indicating better self-care. Cronbach's α in this study ranged from .16 to .84. Physical activity was evaluated using the Korean version of the International Physical Activity Questionnaire. There were continuous and categorical scores on the International Physical Activity Questionnaire. A continuous score was obtained by multiplying the metabolic equivalent task score, physical activity frequency, and duration (in minutes) of walking, moderate-intensity activity, and vigorous-intensity activity. Additionally, according to the total volume and number of days of each activity, individuals were categorized as inactive, minimally active (e.g., 5 or more days of moderate-intensity activity or walking for at least 30 minutes per day), or health-enhancing level of physical activity (e.g., vigorous-intensity activity on at least 3 days achieving a minimum of at least 1,500 metabolic equivalent task-minutes per week). The test-retest reliability for each domain ranged from a Spearman's Rho Coefficient of 0.30~0.61, and validity compared to accelerometer data demonstrated a Pearson's Correlation Coefficient of 0.43 [21]. The glycemic control was assessed using BG and HbA1c levels from electronic medical records. The pre-test data up to 3 months before data collection were compared with the 6-month follow-up data collected within the subsequent 3 months.

3) Stage of Change and Readiness to Change

The stage of change was assessed using a single question about the participants' intention to participate in regular diabetes self-care within the next 6 months. Based on the participants' responses, they were categorized as pre-contemplation, contemplation, preparation, action, or maintenance [13]. 'Readiness to change' identifies the motivation to change [22], including motivation for health behavior [23], personal motivation, and social motivation [24]. The motivation for health behavior was measured by assessing the participants' cognitive evaluation of the effectiveness, benefits, and barriers to participating in self-care behavior as well as their emotional preference for the behavior. Personal motivation was assessed using the third version of the Diabetes Attitude Scale, which consists of nine questions designed to measure the internal factors,

such as attitudes and beliefs about health. Cronbach's α was .63 to .74 in the study of Choi [25] and .58 to .65 in this study. Social motivation was measured using the Diabetes Family Behavior Checklist-2 [7], consisting of five questions designed to measure the positive support for self-care from family and neighbors. Cronbach's α was .84 in the study of Jeon and Park [7] and .80 in this study.

4. Qualitative Data Collection

To obtain qualitative data, the female principal researcher (MK), a master's student in nursing, explained the purpose of this study to patients waiting for an outpatient medical consultation who had never met before the interview. The principal researcher conducted face-to-face interviews with participants who agreed to participate. Before starting the interview, the researcher explained who she was, why she was interested in this research question, and adopted an attitude aimed at understanding the participant's experience. The researcher began by asking participants about their recent health conditions and BG management to help them become comfortable with the conversation and build trusting relationships. The interviews were conducted for 20 to 35 minutes in a quiet outpatient consultation room to ensure confidentiality of the interview content. All processes were recorded using digital recording appliances while the notes were written. The semi-structured interview began with an open-ended question: "How was your experience participating in the diabetes management program using the app for 6 months?" The semi-structured questions were developed based on the previous literature and reviewed by a professor and a doctoral student for validation. During the interviews, additional questions were asked if anything was ambiguous or not understood, and the content of the interviews was summarized. We received feedback from the participants and conducted interviews until data saturation was achieved.

5. Intervention

The APSC program was developed for patients with T2DM to efficiently manage self-care. It closely monitors the participants' self-care status and utilizes algorithms to provide personalized care, including customized goals and automated feedback. The participants engaged in exercise, followed a specific diet, underwent BG testing, adhered to medication, and

were recorded on the app. They received (1) personalized goals, (2) education, (3) monitoring, and (4) feedback through the intervention. The initial exercise goal was set at 50 minutes per day. The dietary goal was determined by calculating the appropriate calories by multiplying the standard body weight with the activity level. The goal of the medication was 100.0% adherence; additionally, BG monitoring was performed at least once a day.

Education was conducted focusing on the necessity and methods for managing diabetes. A monitoring reminder was sent daily at 8 PM. The goal achievement graphs were displayed on the home screen, allowing users to check their status easily. The feedback was sent at 8 AM regarding the highest and lowest goal achievement rates of self-care behaviors on the previous day. In addition, the research team encouraged daily self-care and app-based monitoring through calls or messages, aiding goal setting, checking participants' learning, and providing positive feedback and complication risks [18].

6. Data Analysis

Quantitative data were analyzed using SPSS, version 26.0 (IBM Corp.). The participants' characteristics, levels of self-care behavior, glycemic control, stage of change, and readiness to change in the CG and NCG were analyzed in terms of the frequency, percentage, mean, and standard deviation.

Qualitative data were transcribed and analyzed using an inductive content analytic technique following the approach outlined by Elo and Kyngäs [26]. First, all possible meaningful content was identified in the data to be analyzed and organized into a statement, and the selected meaningful content was written on coding cards. Second, the generated coding cards were grouped into common patterns and meanings, and organized into subcategories. Finally, the generated subcategories were integrated based on their meanings and abstracted into high-level categories. The entire research process and analysis results were reviewed by a nursing professor with extensive experience in qualitative research, and the key statements, codes, and categories were repeatedly revised. This study followed the trustworthiness criteria of Lincoln and Guba [27]. The researcher and the nursing professor cross-verified the participants' statements to ensure credibility. Data collection was stopped in the participant interviews when data saturation was confirmed, signifying that there were no further meaningful data for transferability. The principal researcher acquired a

foundation in mixed methods and qualitative research through coursework, and actively participated in seminars and workshops for dependability. The comprehensive application of content analysis was carried out, along with pre- and post-analysis reflections to maintain neutrality for confirmability.

7. Ethical Considerations

This study was approved by the Institutional Review Board (IRB) of Pusan National University Yangsan Hospital (IRB 04-2021-052). The principal researcher informed the participants about the purpose, methods, benefits, and risks of the research; the necessity of audio-recording interviews; privacy and confidentiality assurances; and the right to refuse involvement, according to the Helsinki Declaration. Subsequently, the researcher obtained written informed consent from all participants.

RESULTS

1. Participant Characteristics, Levels of Self-Care Behaviors and Glycemic Control

The participant characteristics are summarized in Table 1. In the CG and NCG, male accounted for 57.1% and 55.6%, respectively, and the mean ages were 60.71 and 58.78 years, respectively. All participants in the NCG were married, while

only 57.1% in the CG were married. Regarding the monthly income, 71.4% of the CG earned less than two million won, whereas 55.6% of the NCG earned two million won or more. Both groups had a mean diabetes diagnosis duration of 14.00 years. The treatment methods used were oral hypoglycemic agents and insulin combination therapy in 57.1% of the CG and 55.6% of the NCG. The proportions of participants with comorbidities were 57.1% and 66.7% in the CG and NCG, respectively.

The levels of self-care behaviors and glycemic control of the participants in the CG and NCG are shown in Table 2. In the CG, diabetes self-care behaviors were 42.57 at baseline, increasing to 52.00 after 6 months, while in the NCG, the behaviors increased from 39.78 to 41.67. In the CG, the proportion of minimally active was maintained at 71.4% and health-enhancing level of physical activity increased from 0.0% to 14.3%. In the NCG, the proportion of minimally active decreased from 77.8% to 55.6%, and that of inactive individuals increased from 11.1% to 44.4%.

In terms of glycemic control, BG slightly decreased from 169.14 to 164.57 mg/dL in the CG and from 189.22 to 182.00 mg/dL in the NCG. While the HbA1c level (%) was higher in the CG (8.63) than in the NCG (8.00) at baseline, it was 7.46 in the CG and 7.70 in the NCG after 6 months, with the CG demonstrating a lower level.

Table 1. Baseline Characteristics of the Participants (N=16)

Characteristic	Subheading	CG (n=7)	NCG (n=9)
Sex	Male	4 (57.1)	5 (55.6)
Age (year)	<60	2 (28.6)	4 (44.4)
	≥60	5 (71.4)	5 (55.6)
	Mean	60.71±5.74	58.78±8.09
Marital status	Married	4 (57.1)	9 (100.0)
Employment status	Employed	4 (57.1)	6 (66.7)
Monthly income (10,000 won)	<200	5 (71.4)	4 (44.4)
	≥200	2 (28.6)	5 (55.6)
Duration since DM diagnosis (year)	<10	3 (42.9)	4 (44.4)
	≥10	4 (57.1)	5 (55.6)
	Mean	14.00±10.42	14.00±11.25
DM treatment method	OHAs	3 (42.9)	4 (44.4)
	OHAs+insulin	4 (57.1)	5 (55.6)
Comorbidities	Yes	4 (57.1)	6 (66.7)
Number of comorbid conditions	1	3 (75.0)	4 (66.7)
	≥2	1 (25.0)	2 (33.3)

Values are presented as *n* (%) or mean±standard deviation. CG=Compliance group; DM=Diabetes mellitus; NCG=Non-compliance group; OHA=Oral hypoglycemic agents.

Table 2. Levels of Self-Care Behaviors and Glycemic Control (*N*=16)

Outcome	CG (<i>n</i> =7)		NCG (<i>n</i> =9)	
	T ₁	T ₂	T ₁	T ₂
Self-care behaviors				
Diabetes self-care behaviors	42.57±8.87	52.00±7.92	39.78±8.69	41.67±11.66
Physical activity (metabolic equivalent task-minute/week)	1,090.57±719.38	1,898.14±1,243.11	1,903.56±894.18	1,130.67±797.62
Inactive	2 (28.6)	1 (14.3)	1 (11.1)	4 (44.4)
Minimally active	5 (71.4)	5 (71.4)	7 (77.8)	5 (55.6)
Health-enhancing physical activity	0 (0.0)	1 (14.3)	1 (11.1)	0 (0.0)
Glycemic control				
BG (mg/dL)	169.14±57.08	164.57±53.57	189.22±39.89	182.00±69.10
HbA1c (%)	8.63±2.52	7.46±0.84	8.00±0.81	7.70±0.42

Values are presented as mean±standard deviation or *n* (%). BG=Blood glucose; CG=Compliance group; HbA1c=Hemoglobin A1c; NCG=Non-compliance group; T₁=Baseline; T₂=6-Month follow-up.

2. Health Behavior Monitoring, Stages of Change, and Readiness to Change of the Participants at the 6-Month Follow-Up

Table 3 presents the health behavior monitoring using the app, the proportion of participants in the action stage for each self-care, and the readiness to change at the 6-month follow-up. Overall, the CG had a higher monitoring frequency (5.67 times per week) than the NCG (1.11 times per week). The CG also had a higher proportion of participants in the exercise and diet action stages. In terms of the readiness to change, the CG showed slightly higher motivation for health behaviors and social motivation, whereas the NCG showed slightly higher personal motivation.

3. Qualitative Results

After analyzing the interview data, 185 key statements were categorized into 35 codes, which were grouped into 11 subcategories. Three main categories were derived from the data: positive perceptions of app functionality and usage, facilitating factors for app usage, and barriers to app usage (Table 4). Positive perceptions of the app functionality and usage were more common in the CG than in the NCG. The primary barrier for the NCG was “lack of need for self-care utilizing an app.” Notably, the CG highlighted positive perceptions such as “improved diet,” “increased BG monitoring,” and “first step in regular exercise.” Both groups identified “system-related difficulties” as a major barrier.

Table 3. Health Behavior Monitoring, Stage of Change, and Readiness to Change at 6-Month Follow-Up (*N*=16)

Characteristic	CG (<i>n</i> =7)	NCG (<i>n</i> =9)
Mean frequency of health behavior monitoring		
Exercise	5.47±2.01	1.06±1.10
Diet	4.84±3.27	1.19±1.37
BG testing	5.81±1.21	0.99±1.44
Medication	6.57±0.38	1.23±1.34
Total	5.67±1.20	1.11±1.26
Proportion of participants in the action stage		
Exercise	5 (71.4)	6 (66.7)
Diet	5 (71.4)	3 (33.3)
BG testing	4 (57.1)	6 (66.7)
Medication	5 (71.4)	9 (100.0)
Readiness to change		
Motivation for health behaviors	91.29±8.90	89.22±5.72
Personal motivation	33.29±2.63	35.22±1.72
Social motivation	22.71±2.63	19.67±4.24

Values are presented as mean±standard deviation or *n* (%). BG=Blood glucose; CG=Compliance group; NCG=Non-compliance group.

1) Positive Perceptions of App Functionality and Usage

Three subcategories reflecting the positive perceptions of app functionality and usage were identified: (1) improved diet with a goal achievement graph, (2) increased awareness of the need for BG monitoring, and (3) the first step in regular exercise. The subcategory (3) was highly prevalent (100.0%) in the CG.

(1) Improved diet with goal achievement graph

The CG (57.1%) and NCG (11.1%) identified and adjusted their food intake to address the deficiencies in specific food groups, while reducing excessive consumption. Additionally, tracking the calorie content when entering meals in the app

Table 4. Participating Experience in Automated Personalized Self-Care Program (N=16)

Category	Subcategory	CG (n=7)	NCG (n=9)
Positive perceptions of app functionality and usage	Improved diet with goal achievement graph	4 (57.1)	1 (11.1)
	Increased awareness of the need for BG monitoring	4 (57.1)	2 (22.2)
	First step in regular exercise	7 (100.0)	2 (22.2)
Facilitating factors for app usage	Feedback from the research team via phone call	4 (57.1)	1 (11.1)
	Encouragement and support from people around them	5 (71.4)	2 (22.2)
	Desire not to be a burden to their family	2 (28.6)	0 (0.0)
Barriers to app usage	Lack of need for self-care utilizing apps	0 (0.0)	9 (100.0)
	Stress due to disappointing health outcomes and personal events	1 (14.3)	5 (55.6)
	Concerns about the negative view of people	0 (0.0)	3 (33.3)
	System-related difficulties	5 (71.4)	8 (88.9)
	Limitations due to COVID-19	1 (14.3)	2 (22.2)

Values are presented as n (%). BG=Blood glucose; CG=Compliance group; NCG=Non-compliance group.

proved to be beneficial for diabetes management.

"I was uncertain about how to regulate my meals... and unsure if my current food intake was appropriate... However, (after using the app) I realized that I was consuming more than twice the recommended amount." (Participant 2)

(2) Increased awareness of the need for BG monitoring

The CG (57.1%) and NCG (22.2%) increased their awareness of BG management and made efforts to measure their BG levels regularly, including those who did not do so daily.

"I find myself conducting glucose tests more frequently than before because I need to input (the BG data) in the app... Whenever the app displays high readings, it increases my awareness of the importance of monitoring my BG levels." (Participant 15)

(3) First step in regular exercise

The CG (100.0%) and NCG (22.2%) recognized the significance of management through app-based exercise target graphs and educational materials, motivating them to incorporate self-care into their daily lives. They gradually implemented these actions in a personalized manner.

"I have started to incorporate more exercise into my routine. Because of my job, it is difficult for me to follow a regular exercise schedule. However, whenever I have some free time during my shifts, I make an effort to walk and climb hills." (Participant 15)

2) Facilitating Factors for App Usage

The three major facilitating factors for app usage were (1) feedback from the research team via phone calls, (2) encour-

agement and support from people around them, and (3) desire not to be a burden to their family. The subcategory (2) was prominent in the CG (71.4%).

(1) Feedback from the research team via phone call

This subcategory was observed in the CG (57.1%) and NCG (11.1%). When receiving calls from the research team, the participants became aware of the consequences of neglecting diabetes management, motivating them to improve their app usage. Feedback based on monitoring records was valuable for identifying the missing or inadequate aspects of BG management.

"The researcher's continuous attention stimulates us, triggers reflection, and motivates improvement. It reminds me to stay attentive even when I tend to forget about diabetes management." (Participant 11)

(2) Encouragement and support from people around them

The data regarding this feedback were derived from the CG (71.4%) and the NCG (22.2%). Using the app helped their families realize the importance of diabetes self-care. It provided assistance in planning diabetes-friendly meals, encouraging exercise, and creating a shared interest in BG management.

"My wife pays attention to cooking rice with mixed grains and takes care of side dishes accordingly. The app has been very helpful in adjusting our food choices." (Participant 15)

(3) Desire not to be a burden to their family

This was observed in two participants in the CG (28.6%). The participants were concerned about the potential complica-

tions and burdens resulting from insufficient self-care, especially regarding their children's well-being. These concerns motivated them to set goals for more effective app usage, which led to increased self-care behaviors and continued app use.

"But now, I have many thoughts like, 'If I want to live healthy and not be a burden to my children, I need to be even more determined and persistent (in managing my condition).'" (Participant 9)

3) Barriers to App Usage

Five subcategories reflecting the barriers to app usage to using the app were extracted: (1) lack of need for self-care utilizing an app, (2) stress due to disappointing health outcomes and personal events, (3) concerns about the negative views of people, (4) system-related difficulties, and (5) limitations due to COVID-19.

(1) Lack of need for self-care utilizing an app

All non-compliance participants answered that they did not feel the need to use the app (100%). Some considered their current diabetes self-care to be sufficient, whereas others experienced discomfort, fatigue, and forgetfulness while using the app, which in turn led to reduced motivation and questioned the app's necessity.

"If diabetes had come to me at young age like you, it would have been great to have an app for diabetes management. Now that I'm in my mid-60s, everything feels bothersome. I simply take my medication as prescribed. I make an effort to maintain a balanced diet and participate in some physical exercise." (Participant 1)

(2) Stress due to disappointing health outcomes and personal events

This was observed in one participant (14.3%) in the CG and five participants (55.6%) in the NCG. Despite their efforts in diabetes self-care, the participants mentioned that unsatisfactory BG results caused stress and hindered app usage. In addition, stress and depression from life events led to a lack of self-care, which contributed to poor app utilization.

"It's difficult to live... Our business went bankrupt. I used to manage my diabetes well in my own way, but it all fell apart due

to stress... I struggle with managing my food intake. When I try to resist the urge to eat, I often find myself eating even more the following day." (Participant 8)

(3) Concerns about the negative view of people

This was observed in only three participants (33.3%) in the NCG. Despite the participants' initial intention to share their diabetes management efforts using an app with others, they faced negative reactions. This led to self-consciousness about using their phones for diabetes management, subsequently reducing their motivation to use the apps.

"I don't look at it at all when working, just quickly during lunchtime. I just don't like sitting and typing information (on my phone). Recording immediately what I ate at the moment is challenging because I feel self-conscious and being noticed by others." (Participant 16)

(4) System-related difficulties

These data were derived from five participants (71.4%) in the CG and eight participants (88.8%) in the NCG. The main system-related difficulties were a small font size, unfamiliarity with the app, and difficulties in monitoring the dietary intake. Visually impaired participants experienced fatigue owing to the small font size of the app and had difficulty watching educational videos for an extended period. In addition, the participants faced issues with touch functions during data input, requiring multiple touches. First-time app users found it challenging to become accustomed to the complexity and long time required for data input. The participants expressed a desire for a simplified input process when searching for a specific menu item while entering dietary data.

"I still struggle to grasp how to use the app correctly. I think I only understand about 30% of its features." (Participant 14)

"Like, when I have marinated ribs, I searched for them in the app, but it only showed the option for 'beef, grilled,' without a specific category for ribs. This lack of specific options causes confusion for me..." (Participant 13)

(5) Limitations due to COVID-19

This was observed in one participant (14.3%) in the CG and two participants (22.2%) in the NCG. Due to the COVID-19 pandemic, they faced restrictions on physical activities, such as gymnasiums closure and limited outdoor activities, leading to

reduced app usage.

"I must admit that I still struggle with it. ... I registered for a gym, but lately, due to COVID restrictions, there aren't many available opening hours for me to go." (Participant 11)

DISCUSSION

This study aimed to qualitatively and quantitatively explore the participation experiences of patients with T2DM, assess changes in the self-care behaviors and glycemic control, and evaluate the stages of change and readiness to change using TTM. The CG more frequently regarded their experiences with the program as positive, whereas the NCG perceived greater barriers to using the mobile app. The CG showed improved self-care behaviors and glycemic control. The proportion of CG participants in the action stage was higher than that of the NCG participants in the exercise and diet domains. In the readiness to change, motivation for health behaviors and social motivation were higher in the CG. Therefore, TTM-based strategies are required to facilitate the progression of NCG to the action stage.

In our study, the BG and HbA1c levels improved after using the app. Similarly, in a previous study that evaluated the effectiveness of a diabetes self-care app, the postprandial BG levels decreased [7]. An increase in the physical activity levels of the participants in the CG was observed in this study, whereas previous studies did not show an increase in exercise [5,7]. The newly developed APSC program is a valuable strategy for improving physical activity in patients with diabetes. Additionally, social motivation in this study was 22.71 for the CG and 19.67 for the NCG, which were higher than the 13.87 in a previous study [7]. This can be attributed to participants receiving support from their families, as is evident through their engagement in the APSC program.

There was a difference in the physical activity levels between the CG and NCG at the 6-month follow-up. Both groups faced limitations imposed by the COVID-19 pandemic, including lifestyle restrictions and social distancing measures. Nevertheless, the CG employed a counterconditioning strategy to overcome challenging situations, whereas the NCG remained in the cognitive stage, without progressing to the action stage. Similarly, previous research by Hidrus et al. [28] reported the impact of processes of change, such as counter conditioning, on increasing the physical activity by harnessing the positive

aspects of individuals' behavioral changes. Consequently, future investigations should prioritize the exploration of patients' processes of change within the TTM to identify effective strategies for diabetes management and facilitate and sustain self-care.

In the qualitative analysis of patients' participation experiences, all participants in the NCG exhibited a "lack of need for self-care utilizing an app." They demonstrated limited knowledge about the app's usage and benefits, and often felt discouraged due to a perceived lack of progress, indicating that they were in the pre-action stage. These participants recognized the app's positive aspects; however, they also expressed concerns about barriers, including inconvenience and discomfort. Conversely, the participants in the CG were mostly in the maintenance stage and reported more positive experiences than barriers to their self-care journey through the app. Therefore, when characteristics associated with the pre-action stage, as described above, are observed, it is essential to provide tailored interventions to facilitate their progression towards the maintenance stage.

In this study, those who considered the app unnecessary expressed the belief that their diabetes was not severe or that their current self-care practices were sufficient. This finding is consistent with that reported by Jeffrey et al. [12]. Additionally, individual beliefs about the app not only affected its usage, but also had implications for HbA1c levels [29]. Therefore, it is imperative to promote the participants' beliefs about the positive impact of diabetes management apps. Various approaches should be attempted, including promotional campaigns, recommendations by healthcare providers, and facilitating information sharing with professionals via apps.

The main barrier mentioned by both groups was "system-related difficulties." The first issue was the small font size, which has also been identified as an obstacle in other qualitative studies of app-based self-care for T2DM patients [12,29]. To accommodate participants with visual impairments or older age, it is crucial to modify the app to include larger font sizes. The second challenge was the unfamiliarity and complexity of the app, emphasizing the importance of patient-healthcare professional interactions until the patients became familiar with the app [29]. Minimizing technical issues is essential for preventing the loss of motivation and disengagement in e-health interventions. Therefore, prompt addressing of the participants' reported technical issues is necessary to ensure their continued use of the app during and after the intervention. Additionally,

the participants in this study did not mention any inconvenience regarding internet connections. However, in previous studies, internet connectivity has been mentioned as a barrier to app usage [12]. Therefore, APSC program and internet connectivity are well established.

In the subcategory “encouragement and support from people around them,” social support played a crucial role in facilitating compliance with the app, aligning with the TTM’s emphasis on involving supportive families and friends during the transition from the action to the maintenance stage [14]. In a previous study, family support was associated with an improved treatment compliance in patients [7]. Telephone feedback from the research team was also identified as a facilitating factor for app usage, consistent with prior research indicating that interaction with healthcare professionals increased the app usage among T2DM patients [7,12]. These combined approaches were considered to enhance participant compliance. In addition, participants expressed a desire to communicate with healthcare professionals while using the app [7]; we believe our APSC program is an excellent tool for promoting such behavioral change.

As this study only included a subset of participants from the APSC program, caution is needed when generalizing the findings to all patients with diabetes using self-care apps. However, this study is significant for the identification of the processes and stages of change between the CG and NCG participating in a diabetes self-care program utilizing a mobile app. Tailored intervention for NCG should be considered based on the process and stage of change.

CONCLUSION

Our study revealed that the CG demonstrated higher levels of physical activity, had a positive perception of the app, and employed more behavioral strategies to manage their diabetes. In contrast, the NCG had a higher rate of recognizing the self-care experience of using apps as a barrier than did the CG. All NCG participants perceived a lack of need for self-care utilizing apps because of their limited knowledge of using apps and understanding their benefits, whereas none of the CG participants perceived this. In the stage of change, the CG had a higher action rate in exercise and diet than the NCG.

These findings highlight the importance of tailoring interventions to the NCG by considering the process and stages of change. We also identified the patient characteristics and partici-

pation experiences that have the potential to enhance intervention compliance. Based on these results, researchers should prioritize efforts to improve participants’ intervention compliance.

ORCID

Mihwan Kim, <https://orcid.org/0009-0004-7881-0756>

Haejung Lee, <https://orcid.org/0000-0003-0291-9945>

Gaeun Park, <https://orcid.org/0000-0003-0923-4340>

Ah Reum Khang, <https://orcid.org/0000-0002-9154-6468>

Authors' contribution

Study conceptualization and methodology - MK and HL; Data collection and analysis - MK and GP; Drafting and critical revision of the manuscript - MK, HL, GP, and ARK; Supervision - HL and ARK; 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.

Funding

This study was a Basic Research Project supported by the National Research Foundation of Korea with funding from the government (Ministry of Education) in 2019 (assignment number: NRF-2019R111A3A01062513).

Data availability

Please contact the corresponding author for data availability.

Acknowledgements

We would like to thank the endocrinology medical staffs at Pusan National University Yangsan Hospital who graciously worked with us and all the participants who participated in this research.

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Effects of sleep quality and physical activity measured by a Fitbit and self-rated questionnaire on the health-related quality of life in community-dwelling older adults: A cross-sectional study

Mi Ui Jeong¹, Yeongmi Ha²

¹Researcher, College of Nursing, Gyeongsang National University, Jinju, Korea

²Professor, College of Nursing · Institute of Medical Science, Gyeongsang National University, Jinju, Korea

Received: November 3, 2023

Revised: December 16, 2023

Accepted: February 7, 2024

Corresponding author:

Yeongmi Ha

College of Nursing · Institute of
Medical Sciences, Gyeongsang
National University, 15 Jinju-daero
816beon-gil, Jinju 52727, Korea
TEL: +82-55-772-8253
E-mail: yha@gnu.ac.kr

Purpose: This study aimed to identify influencing factors on health-related quality of life by examining relationships among sleep quality, physical activity, and health-related quality of life in older adults living in the community using a Fitbit and self-rated questionnaire. **Methods:** The participants were adults aged 65 years and above who were recruited from one senior university and three senior citizen centers. A total of 106 participants were included in the analysis. The data were analyzed with t-test, ANOVA, Pearson's correlations, and multiple regression analysis. **Results:** According to multiple regression analysis regarding objectively measured sleep quality and physical activity using a Fitbit, the factors affecting the health-related quality of life were age ($\beta = -.30, p = .006$), subjective health status as 'moderate' ($\beta = .33, p = .001$), and subjective health status as 'good' ($\beta = .41, p = .001$). In terms of using a self-rated questionnaire, the factors affecting health-related quality of life were age ($\beta = -.27, p = .010$), subjective health status as 'moderate' ($\beta = .32, p = .001$), subjective health status as 'good' ($\beta = .37, p = .001$), and physical activity ($\beta = .18, p = .030$). **Conclusion:** Although the findings may not be generalizable to community-dwelling older adults due to our convenience samples, this study suggests that customized physical activity programs are required to improve health-related quality of life in community-dwelling older adults of different age groups.

Keywords: Aged; Quality of life; Wearable electronic devices; Sleep quality; Exercise

INTRODUCTION

1. Background

The proportion of the Korean population aged 65 years and older is expected to exceed 20% by 2025 and increase to 35.3% by 2040 [1]. As the number of older people are growing, there is increasing social interest in health-related quality of life (HRQoL) for older people to live a healthy and happy life rather than simply extending their lifespan [2]. HRQoL is a health status based on an individual's subjective assessment and has been described as an individual's degree of satisfaction with various dimensions of health, including physical, mental, and

social health, as evaluated from a subjective perspective [3]. HRQoL indicates the health levels of individuals and population groups, and is useful for assessing older adults' daily functioning and well-being [3].

Sleep plays an important role in improving HRQoL, as it can help people recover from fatigue and recharge their minds and bodies, so good sleep is important for maintaining health and improving quality of life [4]. In older adults, sleep quality has been shown to decline with age, with older adults spending more time in bed but less time sleeping, leading to decreased sleep efficiency [5]. These changes in sleep patterns in older adults can affect their daytime activities, causing decreased overall clarity, increased napping, fatigue, drowsiness, and acci-

dent-prone behaviors, leading to decreased quality of life [5]. Sleep disorders in older adults are associated with a variety of health problems and can increase the risk of mortality [6]. Efforts to improve sleep quality are needed to improve HRQoL in older adults, and it is important to first understand their sleep status. Sleep comprises many different aspects, including quantitative measures such as sleep duration, number of awakenings, and time to fall asleep, and qualitative measures such as depth of sleep, and satisfaction with sleep [7]. Owing to the multidimensional characteristics of sleep, it is appropriate to combine objective assessments using polysomnography or sleep activity recording devices with subjective assessments using questionnaires; however, until now, sleep assessment has mostly been subjective using questionnaires [4,8]. Recently, more studies have objectively measured sleep using wearable devices such as Fitbit [8,9]. It is necessary to measure sleep in older adults using objective and subjective measures to understand the impact of sleep on HRQoL.

According to the Korean Ministry of Health and Welfare, the aerobic exercise rate for older adults was 33.2% as of 2020, which falls short of the HP2030 aerobic exercise rate target of 33.6% [10]. Physical activity in older adults helps prevent falls and fall-related injuries, improves bone health and sleep quality, and positively impacts HRQoL [11]. To better understand the relationship between physical activity and HRQoL, it is important to measure physical activity, which can be done subjectively using questionnaires and objectively using a pedometer or Fitbit. When measuring physical activity using self-rated questionnaires, it can be difficult for older adults to accurately recall their past physical activity due to memory and cognitive problems caused by aging [12]. Recently, studies on physical activity have increasingly used pedometers or Fitbits to supplement self-rated questionnaires and secure objective data [13]. It is necessary to measure physical activity in older adults using objective and subjective measures to understand the impact of physical activity on HRQoL.

To date, studies on the effects of sleep and physical activity on the HRQoL of older adults have been consistently conducted on various groups of older adults, including hospitalized and outpatient older adults. However, most of the studies have been subjective assessments using self-rated questionnaires to measure sleep and physical activity in older adults [4]. With the recent development of technology, using Fitbit, it has become possible to measure sleep and physical activity continuously for 24 hours in daily life. As the reliability and validity of

the data measured by Fitbit have been verified, studies on physical activity and sleep using Fitbit are increasing [9,13], but they have not yet been found in Korea. Therefore, this study aimed to identify influencing factors on HRQoL by examining relationships among HRQoL, sleep quality and physical activity measured objectively and subjectively by Fitbit and self-rated questionnaires among community-dwelling older adults.

METHODS

Ethic statement: This study was approved by the Institutional Review Board (IRB) of Gyeongsang National University (IRB No. GIRB-A22-Y-0052). Informed consent was obtained from the participants.

1. Study Design

This was a descriptive correlational study to determine influencing factors on HRQoL by examining relationships among HRQoL, sleep quality and physical activity in community-dwelling older adults. This study was performed according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Reporting Guidelines (<http://www.strobe-statement.org/>).

2. Study Participants

The participants of this study were community-dwelling older people aged 65 years or older who attended one senior college and three senior centers in Jinju City. The selection criteria were as follows: First, they should be able to perform daily physical activities independently. Second, each had a smartphone that could download a Fitbit application. Third, participants scored at least 18 on the Korean Mini-Mental State Examination (K-MMSE) and could communicate. The cutoff value for the K-MMSE score was based on a feasibility study of dementia screening in community-dwelling Korean older adults, which found that the optimal cutoff score for dementia screening was 18 [14]; therefore, the participants in this study had a score of 18 or higher. The exclusion criteria were those who were taking sleeping pills regularly prescribed by the hospital, those who complained of depression or pain that interfered with sleep, those with chronic diseases that may affect sleep (e.g., cerebrovascular diseases such as stroke and heart

failure), and those taking antidepressants or antipsychotic medications.

The sample size was calculated based on the significance level (α) = .05, medium effect size = .15, power ($1-\beta$) = .80, and eight predictors for regression analysis using the G*power 3.1.9.7 program, and the minimum sample size was 109. Considering the dropout rate, 120 participants received the questionnaire and the Fitbit, and 106 copies of the data were used in the final analysis, excluding the data of 14 participants who failed to use the Fitbit for two consecutive days.

3. Measurements

The participants' general characteristics included sex, age, spouse, educational level, and monthly household income. The disease-related characteristics consisted of subjective health status and the presence of underlying diseases.

1) HRQoL

The HRQoL was measured using the Korean version of the Euro Quality of Life Questionnaire 5-Dimensional Classification (EQ-5D) developed by the EuroQol Group [3]. To use the tool, we received the Korean version of HRQoL by mail after approval through the registration process of the EuroQol Group. The EQ-5D consists of five domains: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression, and is organized into three levels: no problem at all (1), some problem (2), and severe problem (3). If each question is answered with 2 or 3, it is judged that there is a problem in each sub-dimension. In this study, the values were calculated using the EQ-5D weighting formula specialized for Koreans in the study by Lee et al. [15], and the HRQoL scores ranged from -0.17 to 1. The higher the weighted score, the higher the HRQoL. The reliability was Cronbach's α = .81 in this study.

2) Sleep Quality

Sleep quality was assessed using the Fitbit and the Korean versions of the Pittsburgh Sleep Quality Index. (PSQI-K) Fitbit is a device equipped with real-time heart rate monitoring and sensitive motion detection and has been tested for validity and reliability for sleep quality and quantity [9]; its sleep measurement accuracy is 96%. We first measured the total sleep time, total bedtime, and sleep efficiency using a Fitbit Versa. The Fitbit was worn 24 hours a day for 3 days, and data from two consecutive 48-hour nights were used. In a systematic review of

Fitbit's accuracy in measuring sleep, 22 studies were analyzed and used data from 1 to 13 days, with 15 studies using Fitbit data from 1 day [16]; therefore, we used data from 2 days of wear.

To measure sleep quality using questionnaires, we used the Korean version of the PSQI-K developed by Buysse et al. [17] and validated for reliability and validity by Sohn et al. [18], the PSQI-K. This tool subjectively assesses sleep over the past month and consists of seven subscales: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleep medication, and daytime dysfunction, totaling 18 questions. Each domain was scored on a scale of 0 to 3, with a minimum score of 0 and a maximum score of 21. Higher scores indicated poorer sleep quality. The PSQI-K by Shon et al. [18] uses a cutoff of 8.5 to categorize people as "good sleepers" if their overall sleep quality score is below 8.5 and "poor sleepers" if it is above 8.5. The reliability of the tool was Cronbach's α = .83 at the time of development, Cronbach's α = .84 by Shon et al. [18], and Cronbach's α = .67 in this study.

3) Physical Activity

Physical activity was measured using the Fitbit and Korean versions of the World Health Organization's International Physical Activity Questionnaire Short-Form (IPAQ-SF). Fitbit is a device with real-time heart rate monitoring and sensitive motion detection and has validated the validity and reliability of physical activity [13]. Physical activity measured by the Fitbit is a step. The Fitbit was worn 24 hours a day for 3 days, and data from two consecutive 48-hour days were used.

The IPAQ-SF tool, which can be downloaded for free [19], is a seven-item questionnaire that measures the frequency (number of times per week) and duration (minutes) of vigorous physical activity, moderate physical activity, and walking in the past 7 days, multiplied by a Metabolic Equivalent Task (MET) value (8.0 MET for vigorous activity, 4.0 MET for moderate activity, and 3.3 MET for walking) based on the intensity of the activity. Total physical activity was defined as the sum of vigorous, moderate, and walking MET scores. The categorical score was categorized into three tiers based on the METs for total physical activity and the type and duration of physical activity. Tier 1 had the lowest level of physical activity, categorized as those who were not in Tier 2 or 3. Tier 2 (moderate physical activity) was defined as vigorous physical activity for at least 20 minutes per day for at least 3 days per week, moderate physical activity for at least 30 minutes per day for at least 5 days per week, or a combination of walking, moderate activity, or vigor-

ous physical activity for at least 5 days per week which equals 600 METs. Tier 3 (high level of physical activity) is when one spends at least 1,500 METs on vigorous physical activity 3 or more days per week or 3,000 METs on a combination of walking, moderate physical activity, and vigorous physical activity 7 days per week.

4. Data Collection

The data for this study were collected from September 2022 to October 2022 from community-dwelling older people aged 65 years or older living in Jinju City. Data was collected after approval from the Institutional Review Board (GIRB-A22-Y-0052). The purpose and contents of the study were explained to each person in charge, and recruitment documents were posted after obtaining permission. Participants who want to participate in the study were given a questionnaire after signing an informed consent form that included information on the purpose and procedures of the study and the expected benefits and disadvantages of participating. If older adults needed assistance in completing the questionnaire, the researcher read it to them in the presence of an impartial observer, such as a staff member of a geriatric college or the president of a senior center. The researcher recorded participants' responses to the questions, and the questionnaire took approximately 25 minutes to complete. After completing the questionnaire, Fitbit devices (product name: Fitbit Versa) were distributed to measure the walking and sleeping status of older adults. Written instructions were provided to individually explain the use and precautions of the device and refer to the use of Fitbit at home. The researcher personally fitted the Fitbit to the participant's wrist and trained the participant to wear the device 24 hours a day for 3 consecutive days. A daily text message was sent to the participants to assist them with continuous 24-hour wear. Once the participants finished wearing their Fitbit, they logged into the website associated with their Fitbit device. They downloaded their sleep quality (total sleep time, total bed time, and sleep efficiency) and physical activity (steps) using an Excel file stored on the dashboard. At the end of the study, the researcher personally collected the Fitbit and provided a small present to each participant.

1) Data Analysis

SPSS/WIN software (version 27.0; IBM Corp.) was used to analyze the collected data. First, the general and disease-related characteristics of the participants were analyzed using counts,

percentages, means, and standard deviations. Second, sleep quality, physical activity, and HRQoL, as measured by the Fitbit and self-rated questionnaires, were analyzed using real numbers, percentages, means, and standard deviations. Third, the differences in HRQoL according to the general and disease-related characteristics of the participants were analyzed using an independent t-test and ANOVA, and Scheffé's test was performed as a post-hoc test. Fourth, the correlations among HRQoL, sleep quality, and physical activity were analyzed using Pearson's correlation coefficients. Fifth, multiple regression analysis was used to determine the effects of sleep quality and physical activity measured by the Fitbit and self-rated questionnaires on the HRQoL.

RESULTS

1. General and Disease-Related Characteristics of Participants

The gender of participants was 61.3% female, with an average age of 75.9 ± 7.0 years, and 45.3% aged 70~79 years. A total of 56.6% of the participants had a spouse, 47.2% had a junior high school diploma or higher, and 58.5% had a monthly household income of less than KRW 1 million. Regarding subjective health, 48.1% reported 'moderate,' and 82.1% reported having a underlying disease (Table 1).

2. Sleep Quality, Physical Activity, and HRQoL Measured Using a Fitbit and Self-Rated Questionnaires

Of the sleep quality metrics measured by Fitbit, total sleep time averaged 371.56 ± 82.77 minutes, total bed time averaged 435.55 ± 97.04 minutes, and sleep efficiency averaged $92.05\% \pm 3.43\%$. The sleep quality score measured by the self-rated questionnaire was 6.26 ± 3.45 out of 21, with 74.5% of the participants getting adequate sleep, with a sleep quality score of 4.59 ± 1.91 , and 25.5% of the participants getting poor sleep, with a sleep quality score of 11.15 ± 1.86 . Analyzing the self-rated questionnaires, the average total sleep time was 372.08 ± 96.86 minutes, and the average total bed time was 447.74 ± 89.81 minutes.

The mean number of steps measured by Fitbit was $11,750.61 \pm 5383.65$, with 45.3% of participants walking less than 10,000 steps per day (mean 7,202 steps) and 54.7% walking more than 10,000 steps (mean 15,514 steps). Total

Table 1. Differences of Health-Related Quality of Life by General and Disease-Related Characteristics of Participants ($N=106$)

Variable	Category	<i>n</i> (%)	Mean±SD	<i>t</i> / <i>F</i>	<i>p</i> -value
Sex	Male	41 (38.7)	0.92±0.13	3.08	.003
	Female	65 (61.3)	0.84±0.14		
Age (year)*	65~69 ^a	27 (25.5)	0.95±0.09	7.26	.001 a>b,c
	70~79 ^b	48 (45.3)	0.86±0.14		
	≥80 ^c	31 (29.2)	0.81±0.15		
Spouse	Yes	60 (56.6)	0.90±0.15	2.30	.023
	No	46 (43.4)	0.83±0.13		
Educational level*	Uneducated ^a	13 (12.2)	0.86±0.10	8.37	<.001 c>b
	Elementary school ^b	43 (40.6)	0.80±0.16		
	Middle school or higher ^c	50 (47.2)	0.93±0.12		
Monthly household income* (10,000 won)	<100 ^a	62 (58.5)	0.84±0.15	5.09	.008 c>a
	100~300 ^b	29 (27.4)	0.89±0.11		
	≥300 ^c	15 (14.2)	0.96±0.13		
Subjective health status*	Poor ^a	35 (33.0)	0.79±0.16	15.12	<.001 c>b>a
	Moderate ^b	51 (48.1)	0.88±0.12		
	Good ^c	20 (18.9)	0.98±0.07		
Underlying disease	Yes	87 (82.1)	0.85±0.15	-2.18	.032
	No	19 (17.9)	0.93±0.10		

The sum of the percentages does not equal 100% because of rounding. *Scheffe' test; SD=Standard deviation.

physical activity measured by the self-rated questionnaire was $4,351.83 \pm 5,302.52$ METs, with 15.1% of participants in Tier 1 (low level of physical activity) receiving 361.47 ± 151.17 METs, 37.7% in Tier 2 (moderate level of physical activity) receiving $1,624.55 \pm 718.58$ METs, and 47.2% in Tier 3 (high level of physical activity) receiving $7,810.58 \pm 6,029.42$ METs. Analyzing the self-rated questionnaires, it was found that the participants spent 79.37 ± 64.05 minutes walking. The HRQoL score was 0.87 ± 0.14 (range -0.171 to 1) (Table 2).

3. Differences of HRQoL by General and Disease-Related Characteristics of Participants

The characteristics that showed differences in HRQoL according to the general and disease-related characteristics of the participants were gender ($t=3.08$, $p=.003$), age ($F=7.26$, $p=.001$), presence of a spouse ($t=2.30$, $p=.023$), educational level ($F=8.37$, $p<.001$), monthly household income ($F=5.09$, $p=.008$), subjective health status ($F=15.12$, $p<.001$), and presence of underlying disease ($t=-2.18$, $p=.032$) (Table 1).

4. Correlations Among Sleep Quality, Physical Activity, and HRQoL Measured Using a Fitbit and Self-Rated Questionnaires

We first examined the relationships between sleep quality, physical activity (steps), and HRQoL, as measured by Fitbit.

We found a significant correlation between steps ($r=.19$, $p=.048$) and HRQoL. The correlations between sleep quality, physical activity, and HRQoL, as measured by self-rated questionnaires, showed that sleep quality ($r=-.29$, $p=.002$), physical activity ($r=.33$, $p=.001$), and HRQoL were significantly correlated (Table 3).

5. Influencing Factors on HRQoL Measured Using a Fitbit and Self-Rated Questionnaires

Before conducting the multiple regression analysis, the variables were checked for normality and multicollinearity; a normal distribution was assumed, and no multicollinearity was found. When analyzing the effects of Fitbit-measured physical activity and participant's characteristics on HRQoL, we found that HRQoL was significantly affected by subjective health rated as good versus poor ($\beta=.41$, $p<.001$), moderate versus poor ($\beta=.33$, $p=.001$), and age ($\beta=-.30$, $p=.006$), with an explanatory power of 43% (Table 4).

The effects of sleep quality, physical activity, and participants' characteristics on HRQoL, as measured by a self-rated questionnaire, were examined and found to be significantly greater when subjective health status was good compared to poor ($\beta=.37$, $p=.001$), moderate compared to poor subjective health ($\beta=.32$, $p=.001$), age ($\beta=-.27$, $p=.010$), and physical activity ($\beta=.18$, $p=.030$), with an explanatory power of 46% (Table 5).

Table 2. Degree of Sleep Quality, Physical Activity, and HRQoL (N=106)

Variable	Category	Range	n (%)	Mean±SD
Objective measurement	Sleep quality			
	TST (minute)			371.56±82.77
	TBT (minute)			435.55±97.04
	SE (%)			92.05±3.43
	Daily steps			11,750.61±5,383.65
	<10,000		48 (45.3)	7,202.58±5,380.02
	≥10,000		58 (54.7)	15,514.50±5,358.20
Subjective measurement	Sleep quality	0~21		6.26±3.45
	Good sleeper	0~8.4	79 (74.5)	4.59±1.91
	Poor sleeper	8.5~21	27 (25.5)	11.15±1.86
	TST (minute)			372.08±96.86
	TBT (minute)			447.74±89.81
	Physical activity (MET)			4,351.83±5,302.52
	Level 1 (low/inactive)		16 (15.1)	361.47±151.17
	Level 2 (moderate)		40 (37.7)	1,624.55±718.58
	Level 3 (high)		50 (47.2)	7,810.58±6,029.42
	Time for walking			79.37±64.05
HRQoL		-0.171~1		0.87±0.14

HRQoL=Health-related quality of life; MET=Metabolic equivalent task; SD=Standard deviation; SE=Sleep efficiency; TBT=Total bed time; TST=Total sleep time.

Table 3. Correlation Among Sleep Quality, Physical Activity, and HRQoL (N=106)

Variable	Sleep quality by Fitbit			Daily steps by Fitbit	Sleep quality	Physical activity
	TST	TBT	SE			
	r (p)	r (p)	r (p)	r (p)	r (p)	r (p)
TST	1					
TBT	.99 (<.001)	1				
SE	-.00 (.966)	-.10 (.322)	1			
Daily steps	-.13 (.106)	-.12 (.215)	.08 (.428)	1		
HRQoL	-.11 (.244)	-.11 (.245)	.05 (.619)	.19 (.048)		
Sleep quality					1	
Physical activity					-.21 (.033)	1
HRQoL					-.29 (.002)	.33 (.001)

HRQoL=Health-related quality of life; SE=Sleep efficiency; TBT=Total bed time; TST=Total sleep time.

DISCUSSION

This study has intended to describe the degree of sleep quality and physical activity in older adults, as measured by Fitbit and self-rated questionnaires, in a community-dwelling older adults and to identify the impact of these factors on HRQoL. The mean score of HRQoL for the participants in this study was 0.87 (range -0.171 to 1). A previous study analyzing the influencing factors on HRQoL for 1,788 older adults using data from the National Health and Nutrition Examination Survey [20] found a score of 0.86, and a previous study examining HRQoL among older adults in Canada and Germany [21] found a score of 0.84 to 0.88, which is similar to our results.

The HRQoL scores of the participants in this study was similar to those of Canadian and German seniors because the participants in this study were seniors who attended senior colleges or senior centers and had health conditions that allowed them to move around and perform daily activities on their own; thus, they have shown a high score on HRQoL by participating in various activity programs provided by the institutions. To maintain or improve the HRQoL of older adults, it is necessary to assess and manage health conditions that cause pain or discomfort, develop the capacity to manage one's health, and explore the development of health promotion programs.

In this study, the sleep quality metric measured by the Fitbit and the self-rated questionnaire was total sleep time, which

Table 4. Influencing Factors on Health-Related Quality of Life Using Fitbit as Objective Measurement (N=106)

	B	SE	β	t	p-value
(Constant)	1.22	0.19		6.44	<.001
Sex (ref=female)	-0.00	0.03	-.00	-0.04	.970
Age	-0.01	0.00	-.30	-2.82	.006
Spouse (ref=no)	-0.06	0.03	-.21	-1.82	.071
Educational level (ref=uneducated)					
Elementary school	-0.03	0.04	-.10	-0.76	.452
Middle school or higher	0.07	0.05	.26	1.54	.127
Monthly household income (10,000 won) (ref= less than 100)					
100~300	0.00	0.03	.00	0.04	.967
≥300	0.01	0.04	.03	0.30	.764
Subjective health status (ref=poor)					
Moderate	0.09	0.03	.33	3.45	.001
Good	0.15	0.04	.41	3.96	<.001
Underlying disease (ref=yes)	0.01	0.04	.03	0.34	.735
Daily steps	0.00	0.00	.09	1.13	.258
$R^2=.43$, adjusted $R^2=.36$, F (p)=6.35 (<.001)					

ref=Reference; SE=Standard error.

Table 5. Influencing Factors on Health-Related Quality of Life Using Questionnaire as Subjective Measurement (N=106)

	B	SE	β	t	p-value
(Constant)	1.23	0.19		6.33	<.001
Sex (ref=female)	-0.00	0.03	-.01	-0.06	.956
Age	-0.01	0.00	-.27	-2.62	.010
Spouse (ref=no)	-0.06	0.03	-.21	-1.85	.067
Educational level (ref=uneducated)					
Elementary school	-0.04	0.04	-.13	-0.95	.347
Middle school or higher	0.06	0.05	.22	1.31	.194
Monthly household income (10,000 won) (ref= less than 100)					
100~300	-0.00	0.03	-.00	-0.03	.973
≥300	0.02	0.04	.04	0.45	.654
Subjective health status (ref=poor)					
Moderate	0.09	0.03	.32	3.48	.001
Good	0.13	0.04	.37	3.57	.001
Underlying disease (ref=yes)	0.00	0.04	.00	0.01	.990
Sleep quality	-0.00	0.00	-.08	-1.00	.320
Physical activity	0.04	0.02	.18	2.20	.030
$R^2=.46$, adjusted $R^2=.39$, F (p)=6.54 (<.001)					

ref=Reference; SE=Standard error.

was 371.56 minutes (approximately 6 hours and 11 minutes) for the Fitbit and 372.08 minutes (approximately 6 hours and 12 minutes) for the self-rated questionnaire. A 2021 study [9] analyzing Fitbit data from people aged over 65 years in the United States found a total sleep duration of 395 minutes (approximately 6 hours and 35 minutes), similar to our results. According to the Centers for Disease Control and Prevention (CDC) [22], healthy adults sleep for at least 7 to 9 hours. Sleeping for less than 7 hours is associated with increased rates of di-

abetes, obesity, hypertension, and cardiovascular disease, as well as weakened immune function [22]. Although total sleep duration tends to decrease with age, and older adults tend to have more difficulty falling asleep and waking up more often during sleep [4,5], we should be concerned about sleep deprivation in older adults to reduce the negative effects of sleep deprivation. To ensure sufficient sleep for older adults, a sleep history questionnaire should be conducted to identify the factors that affect sleep and sleep hygiene education should be con-

ducted according to the education and understanding levels of older adults.

In this study, the sleep quality score measured by the self-rated questionnaire was 6.26 (range 0~21), 25.5% of older adults had poor sleep, and their sleep quality score was 11.15 ± 1.86 . In a previous study [23] that examined sleep quality among community-dwelling people aged 65 years and older, the score was 4.71, indicating that the sleep quality in this study was worse than that in the previous study. Considering that previous studies using community health survey data reported that the older the age, the worse the sleep quality [24], the lower the percentage of 65- to 70-years olds and the higher the percentage of 80-year-olds in this study, the lower the sleep quality. For the elderly with poor sleep in this study, various measures are needed to improve their sleep quality by providing intervention programs tailored to their individual circumstances, such as assessing factors that interfere with sleep or shorten sleep latency or sleep counseling and cognitive behavioral therapy.

The seniors in this study took an average of 11,750 steps per day measured by a Fitbit and reported an average of 79.37 minutes of walking per day in a self-rated survey. It typically takes approximately 110 minutes for an adult to reach 10,000 steps or more, so the 11,750 average daily steps measured by Fitbit suggest that seniors walk for approximately 2 hours or more. However, the study participants reported about 79.37 minutes of walking in the self-rated survey. In comparison, the Fitbit data showed a difference of 11,750 steps (about 110 minutes), suggesting that older adults may have memory distortions when recalling their physical activity. This suggests that future studies on physical activity among the elderly should utilize objective measurement tools such as wearable devices and Fitbits to measure their activity levels more accurately and objectively.

In particular, 54.7% of the older adults in this study took an average of 15,514 steps daily, indicating adequate physical activity levels. Given that the participants in this study included active older adults attending a senior university and senior citizen centers with good subjective health status, a larger number of daily steps taken should be interpreted with caution when extrapolating to the entire population. Considering that a goal of 10,000 steps per day is appropriate for improving the health of adults and older adults [25], it is encouraging that the average number of steps taken by older adults in this study was 11,750. An analysis of the 2014~2017 National Health and Nutrition Examination Survey results showed that increased physical activity was associated with reduced odds of metabol-

ic syndrome and its risk factors in both adults and older adults; however, the positive effects were more pronounced in older adults [26]. Furthermore, given that a meta-analysis showed that walking more than 10,000 steps per day was associated with a lower risk of all-cause mortality [25], there is a need for ongoing walking programs to maintain and improve health in those who walk fewer than 10,000 steps per day.

In this study, community-dwelling older adults measured by a self-rated questionnaire averaged 4,351 METs per day in the “high level of physical activity” category. In the 6th National Health and Nutrition Examination Survey [27], older adults aged 65 years and older had a mean of 2,278 METs, which was higher than the physical activity level of the older adults in this study. This difference may be because the participants in this study were active older adults who attended a senior university or senior citizen centers at least three times a week. In contrast, previous studies analyzing data from the National Health and Nutrition Examination Survey included a wide range of older adults with different ages and chronic diseases. As older adults experience muscle mass loss during the aging process and rapid muscle strength decline is a major contributor to falls, it is important to maintain high levels of physical activity among community-dwelling older adults.

To analyze the effects of HRQoL in this study, multiple regression analysis showed that younger age, better subjective health status, and more physical activity significantly affected HRQoL. First, physical activity, as measured by a self-rated questionnaire, was a significant factor affecting HRQoL in this study. Physical activity, as measured using a self-rated questionnaire, has been shown to affect HRQoL in several previous studies [11,27], supporting our findings. Regular exercise have been reported to maintain bone and muscle mass, improve muscle strength and endurance, enhance physical function, and improve HRQoL [11]. Therefore, it is necessary to provide various physical activity programs according to the characteristics and environment of older adults by age group to continuously maintain and promote physical activity and HRQoL in older adults.

In this study, subjective health status was the most influential factor in HRQoL. Previous studies have shown that a higher subjective health status is associated with a higher HRQoL, supporting the findings of this study [11,28]. Subjective health status has been proposed as an important factor that reflects an individual's physical and mental state regardless of medical diagnosis. Self-rated health may be subjective and simple, but it

has been proven to be a stronger predictor of health outcomes such as mortality or quality of life [29]. According to Statistics Korea, Koreans' life expectancy, an objective health indicator, is higher than the Organization for Economic Cooperation and Development (OECD) average, but its subjective health is at the bottom among OECD countries [30]. Therefore, various strategies to promote positive perceptions of one's health status is necessary.

As expected, age was found to be a significant factor affecting HRQoL. Previous studies [11,28] found that older age was associated with lower HRQoL scores, which is consistent with the results of this study. As the age increases, older adults experience multiple chronic diseases, and these diseases in old age affect the HRQoL of older adults by weakening their ability to perform daily activities, limiting their ability to live independently and be socially active, and adding material and mental burdens to themselves and their families through financial burdens such as medical expenses [28]. Therefore, to maintain HRQoL from the decline in physical function and increase in the prevalence of chronic diseases as older adults get older, facilities such as senior centers should be expanded, and step-by-step exercise programs suitable for each individual's health condition should be actively explored.

This study is the first to assess sleep quality and physical activity using Fitbit and self-rated questionnaires in community-dwelling older adults aged 65 years and above to identify factors influencing HRQoL. However, this study assessed the sleep quality and physical activity of relatively healthy community-dwelling older adults who regularly attended a senior university or senior citizen centers. Therefore, it is difficult to assume that the results represent all community-dwelling older adults. Second, this study was a cross-sectional survey, which makes it difficult to establish a causal relationship between sleep quality, physical activity, and HRQoL. Third, awakening during sleep is a factor that can reduce sleep quality in the elderly, but this study did not measure awakening time or the number of awakenings during sleep; therefore, it is difficult to comprehensively evaluate sleep quality in older adults.

CONCLUSION

This study aimed to examine sleep quality and physical activity among community-dwelling older adults aged 65 years and above using Fitbit and self-rated questionnaires to determine the impact of these factors on HRQoL. The findings showed

that HRQoL was positively related to physical activity (steps) measured by Fitbit and significantly related to sleep quality and physical activity measured using a self-rated questionnaire. Multiple regression analysis showed that physical activity and sleep quality measured by Fitbit were not influential factors on HRQoL in older adults. In contrast, physical activity, age, and subjective health status measured by self-rated questionnaires were significant factors, with an explanatory power of 46%.

Based on these findings, there are several suggestions. First, as this study was conducted in institutions such as a senior university and three senior citizen centers, it is necessary to repeat it in the future by expanding the number of participants to include older adults with various physical activity characteristics in the community. Second, the data utilized in this study are cross-sectional, which has limitations in suggesting causal relationships between variables; therefore, panel or cohort studies that can analyze the effects over time are needed. Third, senior friendly exercise programs to enhance physical activity are needed to improve HRQoL in older adults.

ORCID

Mi Ui Jeong, <https://orcid.org/0000-0003-2327-0938>

Yeongmi Ha, <https://orcid.org/0000-0001-5587-3990>

Authors' contribution

Conceptualization and study design - MUJ and YH; Methodology, MUJ; data analysis, MUJ; Writing—original draft preparation - MUJ and YH; Writing—review and editing - MUJ and YH. 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.

Funding

None.

Data availability

Please contact the corresponding author for data availability.

Acknowledgements

This article is based on a part of the first author's thesis from Gyeongsang National University.

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Living experiences of older patients with cancer amid the COVID-19 pandemic: A phenomenological study

Yong Hwan Hyeon¹, Kyoung Ja Moon²

¹Postdoctoral Researcher, College of Nursing, Keimyung University, Daegu, Korea

²Associate Professor, College of Nursing, Keimyung University, Daegu, Korea

Received: August 16, 2023

Revised: January 21, 2024

Accepted: February 12, 2024

Corresponding author:

Kyoung Ja Moon

College of Nursing, Keimyung
University 1095 Dalgubeol-daero,
Daegu 42601, Korea

TEL: +82-53-258-7663

E-mail: Kjmoon2150@kmu.ac.kr

Purpose: Patients with cancer experience psychological and social problems; in particular, older patients with cancer face many difficulties during the cancer treatment process owing to aging and underlying diseases. Furthermore, the lives of individuals may be impacted by the COVID-19 pandemic. Therefore, the purpose of this study is to describe the experiences of older patients with cancer during the cancer diagnosis and treatment process amid the COVID-19 pandemic. **Methods:** This study employed a qualitative, descriptive phenomenological approach to explore and analyze the experiences of the participants. The participants in this study consisted of patients aged over 65 who were diagnosed with cancer, and data were collected from May 4 to June 30, 2022 through in-depth individual interviews. The collected data were analyzed using Giorgi's phenomenological analysis. **Results:** Participants were six older patients with cancer with an average age of 69.66 years. Five theme clusters and 15 themes were generated. The theme clusters were "psychological adaptation to cancer diagnosis," "receiving social and medical support," "difficulty in the treatment process," "fear of the COVID-19 pandemic," and "living through difficulties." **Conclusion:** This study revealed that older patients with cancer demonstrated a unique psychology about how to accept the shock of the diagnosis and the resulting coping patterns and feelings of depression. Additionally, it was verified that older patients with cancer, susceptible to infections due to their advanced age and weakened immunity, also face an increased vulnerability to COVID-19. Therefore, a support system tailored to the characteristics of older patients with cancer should be established.

Keywords: Aged; Cancer survivors; COVID-19; Qualitative research

INTRODUCTION

1. Background

The World Health Organization (WHO) predicts that between 2015 and 2050, the proportion of the world's population aged over 60 will increase from 12% to 22% [1]. Korea has one of the fastest-aging populations in the world [2]. According to national cancer registration statistics, one in 25 people (3.9% of the country's total population) are currently undergoing cancer treatment or are survivors of cancer [3]. The cancer survival rate is rising due to recent developments in medical technolo-

gy. Among all cancer patients, patients with cancer aged 65 or older account for 46.4%, and this proportion is gradually increasing [3,4]. Moreover, the older adult population in Korea accounted for 12.8% of the total population in 2015 and will expand to 20.3% in 2025; the proportion of older patients with cancer is also expected to increase as Korea becomes a super-aged society [5].

Patients with cancer undergo multiple stages of psychosocial experiences, including acute and transitional survival stages, extended survival stages, and chronic or permanent survival; simultaneously, they not only experience diagnosis, staging, actual treatment-related emotions, recurrence, financial prob-

lems, and psychosocial sequela, but they also have requirements that vary depending on age and the accompanying disease [6,7]. Hence, to meet the needs of older cancer survivors and improve their quality of life (QoL), older patients with cancer should receive deeper attention [7,8].

In older patients with cancer, risk factors include comorbidities, multiple drug administration, cognitive decline, and decreased physical function, which, unlike younger patients, may introduce additional complexities in cancer treatment with potential risks [9]. In particular, older patients with cancer experience a higher degree of functional decline than older patients with other chronic ailments; moreover, young patients with cancer perceive cancer as a hurdle to be overcome and actively treated, whereas older patients with cancer perceive the disease as leading to death. Older patients with cancer have a low willingness to pursue active treatment; they may wish to live the rest of their lives comfortably and without pain rather than undergo treatment [10]. Additionally, they experience loss due to bereavement from their spouse or close friends passing away, as well as a reduced social role and economic burden owing to retirement [11].

As such, older patients with cancer may experience difficulties in their lives, including physical, emotional, and economic problems, along with social isolation due to the burden of not only the aging process but also cancer treatment. In addition, older patients with cancer are classified as a more high-risk group than any other group in the COVID-19 pandemic context [12]. The total number of confirmed COVID-19 cases nationwide from the initial outbreak until March 10, 2020 was 7,513; notably, 5,663 of these cases were concentrated in a specific region. The average age at the time of death was 75.5 years, and the older adult population showed a higher fatality rate compared to other age groups [13]. This national disaster can affect the cognition and psychology of older patients with cancer classified as high-risk individuals for infection, potentially exacerbating their suffering.

In this study, in-depth interviews were held with older patients with cancer to understand their circumstances and experiences during cancer diagnosis and treatment. The objective of this study is to delve into the rationale for nursing interventions tailored to older patients with cancer, encompassing physical, psychological, and social interventions. Additionally, it seeks to identify the vulnerability of older patients with cancer as recipients of treatment during the COVID-19 pandemic and elucidate the necessity for support. Giorgi's phenomeno-

logical approach was adopted to identify the meaning of the situations and experiences during the treatment process of older patients with cancer and to use the findings as basic data for developing efficient, individual nursing interventions based on patients' needs [14]. Phenomenology involves exploring and integrating what individuals have experienced and how they have experienced it. Giorgi's phenomenology necessitates a return to specific lived situations [14]. Therefore, adopting Giorgi's phenomenology in this study is expected to be beneficial for developing suitable interventions based on the specific experiences of older adults with cancer.

2. Study Purpose

The purpose of this study was to deeply understand their experiences and situations during cancer diagnosis and treatment amid the COVID-19 pandemic.

METHODS

Ethic statement: This study was approved by the Institutional Review Board (IRB) of Keimyung University (IRB No. 40525-202203-HR-010-02). Informed consent was obtained from the participants.

1. Study Design

This study employed a qualitative, descriptive phenomenological approach involving in-depth personal interviews to gain a comprehensive understanding of the experiences of patients aged 65 or older during cancer diagnosis and treatment. The overall process of the study was written by following the consolidated criteria for reporting qualitative research (COREQ) guidelines [15].

2. Participants

Participants were older patients aged 65 or above who were diagnosed with cancer and undergoing treatment such as surgery, chemotherapy, or radiation therapy, or those who were being followed up with after treatment. The participants were six patients who visited a tertiary general hospital as outpatients for cancer treatment, and after hearing an explanation of this study, they expressed their intention to participate. Exclu-

sion criteria included those who had difficulties with communication due to hearing or vision impairments or other physical ailments, had difficulty in consenting based on not sufficiently understanding the study's purpose due to mental illness or dementia, and were in hospice palliative care while receiving treatment or for whom a life-sustaining medical plan had been created.

3. Data Collection

We collected data from May 4 to June 30, 2022. The meeting room in the hospital that the participants visited was used to gather the data. We used a 'criterion sampling' method for participant recruitment, targeting older patients aged 65 and above who were diagnosed with cancer and undergoing treatment. In-depth interviews were held once or twice with each person, and each interview lasted approximately 43 to 86 minutes. The interview questions were constructed with collaborators based on references after the researcher selected a topic (Table 1). The collaborators have experience conducting qualitative and mixed-methods research, with published papers in international academic journals and domestic accredited jour-

nals. Additionally, the collaborators participated in the analysis, categorization, and validation of interview content. Each interview was transcribed and checked to see if repeated content or new perspectives appeared, and the interviews were stopped when the data were judged to be sufficiently saturated.

4. Data Analysis

Phenomenological suspension of judgment requires returning to a state of open exploration, free from any preconceptions or biases. The researchers aimed to recognize and set aside preconceived notions when studying older adults with cancer. Examples of preconceptions include "treatment motivation in older adults with cancer," "desire for a return to normalcy," and patients' expectations that various challenges, including physical, social, economic, and psychological hardships, would emerge even after surviving cancer.

This study was conducted to uncover the experiences of older adults with cancer and to understand and analyze them from a nursing perspective. Giorgi's phenomenological research method was used to explore the participants' experiences of cancer diagnosis and treatment without causal explana-

Table 1. In-Depth Interview Questions

Main questions
How did you feel psychologically and mentally during the diagnosis and treatment?
- What difficult experiences have you encountered as an older patient with cancer?
How were you physically during the treatment?
- Did you find the treatment or testing process physically challenging?
- Were there any specific challenges you faced as an older patient with cancer?
What difficulties have you faced in the past and how have they changed in the present?
- How did you cope with the difficulties you encountered?
What has your life been like since you were diagnosed with cancer?
- Did you have any change regular activities or daily routines after the diagnosis?
- If there have been changes, what aspects of your life have changed?
How are decisions made during the diagnosis and treatment of cancer?
- Have you received sufficient information about your treatment, and did you understand it well?
- Were there any disparities between the decisions made and the direction you hoped for?
As an older adult cancer patient, what do you think you need the most?
- If you received support, what was the most helpful?
What has your experience in cancer diagnosis and treatment meant for your life?
- Is there any significance or notable change in your life?
- Can you recall a moment that brought you a sense of accomplishment or a positive experience?
How are you coping the risk of COVID-19 infection?
- What challenges did you face in the cancer treatment process after the onset of the COVID-19 pandemic, and how did you feel emotionally during that time?
- What specific actions have you taken to cope with the challenges of the COVID-19 pandemic?
What experiences have you had with cancer treatment since the onset of COVID-19?
- What difficulties have you faced in the cancer treatment process after the onset of the COVID-19 pandemic?

tion or negative prejudice [14]. First, the researcher transcribed the content of the participants' experiences verbatim and then repeatedly read the transcripts to grasp the overall outline. Second, using the transcription and field notes, meaningful content was underlined to create a list of semantic units. Third, after discussing the derived meaningful statements with a collaborator, they were expressed in the form of nursing or plain language. Throughout this process, we opted to use nursing and medical terminology, as well as laymen terms, rather than directly quoting the participants' words. Fourth, the re-expressed meanings were derived by themes and theme clusters. Fifth, the derived results were based on the experiences of older patients with cancer [14,16].

5. Trustworthiness

This study evaluated four factors—credibility, transferability, dependability, and confirmability—according to the qualitative research evaluation criteria presented by Lincoln and Guba [17]. To ensure credibility during the data collection, participants were encouraged to state their thoughts as freely as possible without artificially inducing their statements. In the transcription process, the terms used by the subject were described verbatim, and if a statement required further explanation, the researcher called the participant to check whether the statement was consistent with the stated content instead of arbitrarily describing it. To ensure transferability, meaningful topics were derived through practical experiences by citing the participants' statements. To ensure dependability and confirmability, meaningful content was derived by reading the transcript independently of the collaborator, and the processes of recording, coding, and categorizing the interview data were presented. The interview data are available to the reader for verification.

6. Ethical Consideration

Prior to the start of the study, approval was obtained from the Keimyung University Institutional Review Board (IRB) Committee (IRB no. 40525-202203-HR-010-02). It was conducted after obtaining permission from the head of the nursing team of the department and the attending physician. Before the interview, the participants were informed about the purpose of the study, confidentiality of the interview content, voluntarily stopping the participation and guarantee of anonymity. During the interviews, the participants' names and the

transcribed content were distinguished only by participant number. After the interviews, a small gift was given to the participants.

RESULTS

Regarding the participants' general characteristics, there were two male and four female participants, with an average age of 69.7 years; of these, four were married, and two were widowed. Two people were living alone and four were living with their families. Regarding cancer-related characteristics, the participants had been diagnosed with lung cancer (one patient), breast cancer (three patients), liver cancer (one patient), and blood cancer (one patient). The average period of diagnosis was 5.25 years (2.4~8 years). For the diagnosis stage, two patients were in stage 1, one was in stage 2, and three were in stage 4. There were four cases of recurrence or metastasis. Only chemotherapy was performed in three cases, and for surgery, partial resection was performed in one case, and three types of treatment (surgery, chemotherapy, and radiation therapy) were performed in two cases. The average number of chemotherapy and radiation treatments was 23.00 times (4~55 times), and there were three cases of comorbidities including diabetes, hepatitis B, and delirium (Table 2).

Through the integration of meaningful and similar content derived from interviews with these participants, the diagnosis and treatment experiences of older patients with cancer included: "psychological adaptation to cancer diagnosis," "receiving social and medical support," "difficulty in the treatment process," "fear of the COVID-19 pandemic," and "living through difficulties" (Table 3).

1. Psychological Adaptation to Cancer Diagnosis

Participants were completely unaware that they could be diagnosed with cancer and were shocked by their sudden diagnosis. However, they did their best as parents and thought that the process of death was destiny, and they had the heart to live with a positive mindset and treat life and death equally for their remaining lives.

1) To Think About Their Fate and Accept Reality

Participant 2 contemplated the uncertainty of fate and accepted it as an inherent aspect of life, recognizing that no one can predict the future, and mortality is a universal experience.

Table 2. General Characteristics of the Participants (N=6)

Variable	Category	n	Mean (range)
Sex	Male	2	69.7 (67~74)
	Female	4	
Age (year)			
Marital status	Married	4	69.7 (67~74)
	Widowed	2	
Living conditions	Alone	2	69.7 (67~74)
	With family	4	
Diagnosis names	Lung cancer	1	69.7 (67~74)
	Breast cancer	3	
	Liver cancer	1	
	Blood cancer	1	
Period of diagnosis (year)			5.25 (2.4~8)
Cancer stage	Stage 1	2	5.25 (2.4~8)
	Stage 2	1	
	Stage 3	-	
	Stage 4	3	
Recurrence or metastasis	Yes	4	5.25 (2.4~8)
	No	2	
Type of treatment	Surgery only	1	5.25 (2.4~8)
	Chemotherapy only	3	
	Surgery, chemotherapy, radiotherapy	2	
The average number of rounds of chemotherapy and radiotherapy			23.00 (4~55)
Participants with underlying medical conditions (n=3)	Diabetes	1	23.00 (4~55)
	Hepatitis B	1	
	Delirium and stroke	1	

Table 3. Themes Clusters and Themes Generated

Themes clusters	Themes
1. Psychological adaptation to cancer diagnosis	- To think about their fate and accept reality. - Trying to think positively
2. Receiving social and medical support	- The need for close family - Getting help from close friends and neighbors - To entrust their body completely to the medical staff for treatment
3. Difficulty in the treatment process	- Side effects experienced during treatment - The difficulty of medical decision-making - Intensified suffering due to the accompanying illness - Body image is important, even for older patients - Decreased activity and motivation
4. Fear of the COVID-19 pandemic	- Being more cautious due to old age and weakened immunity - Isolation due to social distancing - Experiencing refusal of medical treatment due to COVID-19 transmission
5. Living through difficulties	- Aiming for a healthy diet - Increasing exercise

“No one knows what I will be like tomorrow after living to-day.... Everyone dies. Because I have a set life span, I live my life like this, and when my fate comes to me, I have to accept it.” (Participant 2)

2) Trying to Think Positively

Participant 1 experienced enhanced strength and decreased physical discomfort through positive thinking. Participant 2 believed that positive thoughts led to a positive body response.

“When I think, ‘My body isn’t in good state’, it feels like my body hurts more. But when I think, ‘I’m okay, I can fight and win’, it gives me more strength.” (Participant 1)

“When my thoughts turn positive, my body seems to follow to some extent... I even sing songs and play musical instruments.” (Participant 2)

2. Receiving Social and Medical Support

The participants were overcoming the difficulties of the cancer treatment process by relying on close spouses, friends, and medical staff.

1) The Need for Close Family

Participant 1 reported experiencing anxiety and physical discomfort when alone, often worrying about the possibility of dying without anyone knowing, particularly when not with their family.

“Being alone sometimes makes me feel a bit anxious. There are moments when I think, ‘What if I suddenly die one day and nobody knows?’ When I’m with my family at home, I feel better, but being alone makes me feel unwell physically, and it affects my overall condition. It makes me think, ‘I might die alone like this’, and that thought crosses my mind.” (Participant 1)

2) Getting Help From Close Friends and Neighbors

Participant 1 found it challenging to ask her son for help owing to the distance and his own daily routine; therefore, she relied on her friends for assistance for tasks such as going to the hospital.

“My son is far away, and so it is difficult to ask him for help. He also has his own daily routine, and I did not want to interfere with it. My friends around me are the best. It is convenient to ask them for help. ‘Hey, I have to go to the hospital that day. Let’s go together.’” (Participant 1)

3) To Entrust Their Body Completely to the Medical Staff for Treatment

Participant 5 acknowledged their limited knowledge about targeted therapy and medical treatments, emphasizing the importance of trust in the doctor’s expertise and guidance.

“Ordinary people like us do not know well about targeted

therapy or what kind of treatment is good, because I am not a person with complete knowledge. We have to trust the doctor because the doctor is speaking to us with knowledge and experience.” (Participant 5)

3. Difficulty in the Treatment Process

The participants experienced considerable pain during the treatment process.

Side effects are experienced not only at the time of surgery or chemotherapy but also afterward. Furthermore, the changes in the body caused by aging and accompanying disease exacerbate side effects. Eventually, after the acute phase, the body and mind become exhausted.

1) Side Effects Experienced During Treatment

Participant 4 experienced unusual sensations in her feet and loose teeth during chemotherapy.

“The most difficult thing is... the soles of my feet seem to have chopped glass and walk on it. I couldn’t walk, that was difficult... and my teeth fell out so I had to apply new dentures.” (Participant 4)

2) The Difficulty of Medical Decision-Making

Participant 2 highlighted that in busy hospitals, medical staff often lack the time to address questions from patients. Participant 5 followed the doctor’s recommendations for her lung cancer treatment because of a lack of information and inability to explore other options or seek advice from others.

“In big city hospitals, there is not enough time to ask questions due to the busy schedule of the medical staff.” (Participant 2)

“I didn’t have much information, so I just followed what the doctor said. I might have wondered about other options or treatments for my lung cancer, but I couldn’t even ask others for advice. So, I just followed the doctor’s recommendations.” (Participant 5)

3) Intensified Suffering Due to the Accompanying Illness

Participant 3 expressed that she experienced discomfort in her legs not only due to the side effects of chemotherapy but also due to stiffening of the joints as a result of aging. Participant 6 shared his medical journey, which began with a fall and led to

a diagnosis of cerebral infarction. Subsequent tests revealed an unexpected condition, which doctors identified as leukemia.

“After undergoing chemotherapy, I have a sensation in my soles that feels like someone else’s.... Moreover, my joints and such aren’t in great shape, there are times when they get stiff and all...” (Participant 3)

“After falling down, I became suspicious of something being wrong with my head, so I went to the neurology department, and it was diagnosed as a cerebral infarction.... During various tests, they found strange things, and the doctors said it’s a type of leukemia...” (Participant 6)

4) Body Image Is Important, Even for Older Patients

Participant 4 expressed that losing her hair, especially at the start of chemotherapy, was particularly distressing. She emphasized the importance of appearance, even as a grandmother.

“The worst thing for me was my hair. At the beginning of chemotherapy, I was shocked because my hair and eyebrows fell out. Although I am a grandmother, my appearance is still important.” (Participant 4)

5) Decreased Activity and Motivation

Participant 5 stated that she had lost interest in everything. She felt that her desires had disappeared, possibly because of her age.

“I have lost interest in everything. So sometimes, I even think, ‘Have I ever had depression?’ I used to have such desires. But now, none of that exists. Maybe it’s because of my age.” (Participant 5)

4. Fear of the COVID-19 Pandemic

Participants were afraid due to the fear of infection. They knew that they were in a high-risk group due to older age, had low immunity and underlying diseases, and were trying to strictly follow basic precautions. However, in some cases, participants experienced instances where they were denied medical treatment.

1) Being More Cautious Due to Old Age and Weakened Immunity

Participant 1 reported that a relative of hers, who was in

poor health, died from a COVID-19 infection. Having observed this, and being aware of her own weak immune system, she was worried about getting infected.

“My relative, who wasn’t in good health, passed away due to a COVID-19 infection. Having witnessed such a situation and considering that I have a weak immune system, I often think that I shouldn’t get infected.” (Participant 1)

2) Isolation Due to Social Distancing

Participant 4 mentioned that during the COVID-19 pandemic, she was cautious about not going to crowded places and avoided gatherings.

“During the COVID-19 period, I made sure not to go to crowded places and avoided gatherings when they were strongly discouraged. I refrained from attending social gatherings and took extra precautions as a patient.” (Participant 4)

3) Experiencing Refusal of Medical Treatment Due to COVID-19 Transmission

Participant 6 described a situation where he was en route to the hospital but received a phone call instructing him not to come in. This led to the postponement of his positron emission tomography (PET) scan, and the following week, he was unable to go to the hospital.

“I was on my way to the hospital; I received a phone call telling me not to come in. So, I had to turn back. After that, my PET scan was postponed, and the following week, when I needed to collect my prescription, I couldn’t go to the hospital.” (Participant 6)

5. Living Through Difficulties

After their cancer diagnosis, the participants improved their eating habits and increased their amount of exercise to manage their cancer while also trying to live a dignified life. They also changed their diet to a healthy one containing protein, vegetables, and fruits, and participated in light exercise and walking.

1) Aiming for a Healthy Diet

Participant 4 shared her dietary regime, which included specific amounts of fruit, carbohydrates in the morning, meat at each meal, and eggs. She mentioned that, because of her age,

she could not taste these foods properly.

“Eat a certain amount of fruit, eat a certain amount of carbohydrates in the morning, eat a certain amount of meat at each meal, eat eggs, and eat fruit, but they don’t taste good because of my age.” (Participant 4)

2) Increasing Exercise

Participant 1 emphasized the importance of regular exercise and gradual progress.

“Exercising regularly... and exercising every day. At first, I could not walk for 10 minutes. However, because it was repeated step-by-step, currently, I can exercise from 1 hour to 1 hour 30 minutes per day.” (Participant 1)

During the COVID-19 pandemic, older patients with cancer experienced various challenges, including psychological adaptation to their cancer diagnosis, seeking social and medical support, coping with treatment-related difficulties, and dealing with COVID-19-related fears. Older patients with cancer made efforts to adapt to their cancer diagnosis during the pandemic, involving accepting their reality and attempting to empty their minds to lead a more positive life. However, the fear of loneliness had a negative impact on this adaptation process, emphasizing the importance of maintaining relationships, especially with close friends and neighbors. Trusting their medical team and entrusting their bodies entirely for treatment was also observed.

The treatment process posed multiple challenges, including side effects, difficulties in medical decision-making, and increased suffering due to coexisting illnesses. The importance of body image became apparent even for older patients, and a decline in physical activity and motivation was noted, suggesting the need for support in these areas.

Additionally, older adults with cancer exhibited increased caution during the COVID-19 pandemic owing to their age and weakened immunity. Social distancing measures led to feelings of isolation, and some patients faced challenges accessing medical treatment due to COVID-19 concerns, further exacerbating the difficulties in their cancer treatment journey.

Nevertheless, patients made efforts to overcome this challenging period by focusing on maintaining a healthy diet and increasing physical activity. They displayed resilience, strong determination, and hope in facing these difficulties.

DISCUSSION

In this study, Giorgi’s phenomenological method was used to understand and comprehensively analyze the experiences of diagnosis and treatment of cancer in older patients. It was found that a treatment and educational intervention program suitable for the characteristics of older patients with cancer is needed, and studies should be conducted on controlling factors that could affect QoL during the course of treatment.

Cancer diagnosis is accompanied by various emotions, such as uncertainty and hopelessness, which cause psychological pain and lead patients with cancer to develop new identities [10]. Although the participants were shocked to receive a cancer diagnosis in an unexpected circumstance, they had already lived most of their lives and accepted this situation as their fate. They also experienced the need to shift toward positive thinking to actively engage in the treatment process. These results are similar to those of previous studies [10,18]. In other words, both young and older patients require psychological adaptation to cope with cancer. Both groups receive various types of treatment and experience the pain associated with treatment. However, previous studies indicated that older adults primarily used resignation as a psychological adaptation [18]. In contrast, participants in this study demonstrated multifaceted approaches to adaptation, including resignation, maintaining hope, and actively engaging in treatment. Furthermore, owing to the high frequency of complications and differences in viewpoints on life expectancy, older patients with cancer tend to be provided relatively passive treatment compared with younger patients [19].

Moreover, depression, one of the psychological issues experienced by older patients with cancer, is difficult for them to perceive on their own and is often considered a natural phenomenon due to aging, making it difficult to intervene appropriately [20]. Furthermore, depression negatively impacts the effectiveness of cancer treatment and patients’ QoL and older patients express depression differently from younger patients and may appear to show a loss of interest [21]. Therefore, in-depth research is necessary to determine the psychological characteristics of older patients with cancer and to facilitate their decision-making regarding active treatment options by providing interventions to improve QoL and reduce the side effects of cancer treatment.

Social support for patients with cancer is multifaceted and includes instrumental support (e.g., physical/medical support),

material support (e.g., financial support), informational support (e.g., advice, education), and emotional support (e.g., empathy) [22]. However, in previous studies, it was suggested that young patients require more social resources [18]. In contrast, this study revealed that older patients with cancer also require the support of family or social resources. The factors supporting the participants in this study included not only medical treatment but also their spouses and close neighbors. This finding was similar to that of a past study on the experience of recovering a sense of ego integrity in older patients with cancer [6].

However, the proportion of older adults living alone in Korea increased from 16.0% in 2000 to 19.8% in 2020 [23], and spousal death and social isolation make older patients vulnerable to not receiving appropriate health care [6]. In a situation where the prevalence of cancer in older adults is rising due to aging [24], social and institutional improvements are needed to compensate for this.

Moreover, the participants were highly dependent on medical staff for treatment decisions. This observation is similar to the experiences of decision-making in older patients with cancer in a study by Kim and Hong [25]. The support provided by medical staff in this situation helps improve QoL by reducing uncertainty and depression [22]. Thus, healthcare professionals need to thoroughly comprehend the physical and psychological characteristics of older patients with cancer and strive to provide optimal treatment to enhance their QoL.

In our study, participants predominantly reported experiencing fatigue and leg numbness as adverse effects of cancer treatment. Additionally, they faced the obstacles of a reduced appetite due to aging and treatment-related side effects. Physical activity and the quality of one's diet are important factors in improving the prognosis and QoL of patients with cancer. However, owing to side effects related to cancer or its treatment and diseases that accompany aging, the degree of function varies from person to person, making it necessary to consider the best approach [26].

Previous studies have confirmed the benefits of reducing cancer-related burden and improving fatigue through nutritional and exercise interventions suitable for individuals [26,27]. Hence, the condition of older patients with cancer should be evaluated in advance, and an intervention should be applied according to observations of their fatigue, ability to exercise, and food preferences.

The participants in this study consisted of older patients undergoing cancer treatment or follow-up care during the ongoing

COVID-19 pandemic. They expressed a profound fear of infection due to their awareness of being high-risk individuals with weakened immunity and underlying health conditions. This finding was similar to the perception of risk and psychosocial responses (such as anxiety and depression) in a study carried out on patients with lung cancer during the COVID-19 pandemic by Hyland and Jim [28]. Older patients with cancer, despite requiring support from their surroundings, encountered challenges such as the loss of a spouse, distant family members, or social isolation. Also, social distancing and staying at home due to the pandemic cause older adults to spend considerable time alone, heightening their feelings of isolation and loneliness [29]. Therefore, during an infectious disease outbreak, special attention is needed for emotional support for older adults with cancer. Solutions can be provided by utilizing remote communication and digital platforms to maintain contact with family and the local community. Moreover, these platforms can be used to provide medical information and offer services such as remote counseling.

Korea's epidemic prevention system, including social distancing measures, has set a good precedent in mitigating the damage caused by infectious diseases. However, a significant finding from the present study was the occurrence of healthcare gaps for high-risk patients. Notably, some participants from an area experiencing the first outbreak of a mass infection in Korea were denied medical treatment at hospitals where they had previously received follow-up care. In previous studies, cases of medical refusal or delays in treatment for COVID-19 patients were commonly reported phenomena [30].

The potentially fatal consequences of the stigma surrounding new infectious diseases for patients with cancer requiring close monitoring are concerning. This study underscores the need for proactive measures and bridging medical gaps to protect vulnerable groups amidst limited information on new infectious diseases. Hence, it is necessary to prepare for potential risks in future epidemics and establish an improved healthcare system with treatment protocols tailored to the Korean context. In particular, it is imperative to develop and implement a support system that considers the unique characteristics of older patients with cancer.

1. Limitations

In this study, convenience sampling was not performed in

the process of selecting participants, but the small sample size also warrants caution when interpreting the results. Additionally, the participants had good functional status in their daily life; thus, it is highly likely that their characteristics influenced the findings. Furthermore, as we explored the overall experience of older patients with cancer, since many common themes emerged, there may be limitations in uncovering significant meanings specific to certain situations. Nonetheless, the participants exhibited a positive and hopeful attitude regardless of the stage of their cancer or not having been cured yet. This study has unveiled meanings, including perspectives on older patients with cancer that diverge from conventional knowledge, offering valuable insights. It has also highlighted the necessity for support to groups that may be vulnerable during situations such as infectious diseases and other disasters. In future studies, it will be necessary to consider the various cancer stages and functional states of older patients with cancer.

CONCLUSION

In a situation where the survival rate from cancer has risen owing to advances in medicine, and the expected survival of older patients with cancer is increasing, measures to improve their diagnosis, treatment, survival process, and QoL should be devised. Older patients with cancer have certain characteristics that clearly differ from the coping patterns of younger patients with cancer; as such, medical staff need to recognize these characteristics and provide medical services tailored to older patients with cancer. Furthermore, it is necessary to design customized exercise interventions, diet education programs, and psychological support that can improve the QoL of older patients with cancer.

ORCID

Yong Hwan Hyeon, <https://orcid.org/0000-0002-4618-4066>
Kyoung Ja Moon, <https://orcid.org/0000-0002-3475-739X>

Authors' contribution

Conceptualization or/and Methodology - YHH, KJM; Data collection or/and Analysis - YHH, KJM; Writing–original draft or/and review & editing - YHH, KJM

Conflict of interest

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

Funding

This research was supported by the Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (grant #2019R111A3A01060561).

Data availability

Please contact the corresponding author for data availability.

Acknowledgements

None.

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Recovery experience of older adults with COVID-19: A grounded-theory study

Hee-Sook Kim¹, Jae Wan Park²

¹Professor, College of Nursing, Kyungpook National University · Research Institute of Nursing Innovation, Kyungpook National University, Daegu, Korea

²Lecturer, College of Nursing, Kyungpook National University · Research Institute of Nursing Innovation, Kyungpook National University, Daegu, Korea

Received: September 25, 2023

Revised: February 16, 2024

Accepted: February 19, 2024

Corresponding author:

Jae Wan Park
College of Nursing, Kyungpook
National University · Research
Institute of Nursing Innovation,
Kyungpook National University, 680
Gukchaebosang-ro, Jung-gu, Daegu
41944, Korea
TEL: +82-53-420-4927
E-mail: morrall@naver.com

Purpose: This study aimed to understand the lives of recovered COVID-19 patients from the viewpoints of people over the age of 60. **Methods:** The participants were 15 recovered patients aged over 60 who had been infected with COVID-19. Data were collected individually through in-depth interviews from September 12, 2022 to February 27, 2023. Contents of the transcribed interviews were analyzed using Corbin and Strauss's grounded theory approach. **Results:** Analysis of the psychological recovery experience for older adults with COVID-19 resulted in six themes, 14 sub-themes, and 41 codes. The core category revealed was turning crisis into opportunities throughout making meaning of living in the time of COVID-19. The causal conditions included feeling disrupted due to unknowns during a crisis. The contextual conditions were a lack of support system for COVID-19 groups. The central phenomenon was a life shattered amidst COVID-19-related helplessness. The intervening conditions were rebound for changes for transformation. As a result, the action/interactional strategies were employed to find a breakthrough. In consequence, enhancement of resilience was achieved after overcoming obstacles. **Conclusion:** The findings provide important recommendations for healthcare professionals regarding older patients who have had COVID-19. We encourage healthcare providers to improve patient care by gaining a deeper understanding of their recovery experiences.

Keywords: Aged; COVID-19; Grounded theory; Psychology; Qualitative research

INTRODUCTION

Stringent public health strategies to limit COVID-19 transmission have resulted in adverse consequences, particularly for aged patients with COVID-19 and chronic comorbidities, whose voices and perspectives are often unheard [1]. Older patients have higher risks of mortality, comprehensive insecurities after retirement, and exclusion from social and public engagements [2]. A previous study indicates that older patients with COVID-19 are vulnerable to infectious diseases. It shows that aging is closely related to COVID-19 severity, long-term hospitalization, the need for intensive care to support daily requirements, and higher mortality rates [3]. Systematic reviews

and meta-analysis results also suggest that aging is related to higher emotional distress [4].

As COVID-19-related long-term hospitalization requires intensive care to support daily requirements, older adults showed adverse outcomes owing to forced hospitalization or quarantine measures. The quarantined situation due to the COVID-19 crisis can influence multiple psychological dimensions in older patients [5]. A previous study indicates that older adults have difficulty adapting to significant life changes after quarantined circumstances [6]: the restricted use of community resources, enforced social isolation, aggravated loneliness, and disrupted outdoor activities, adversely affecting mental and physical health. Researchers have demonstrated that older adults with

COVID-19 in forced situations are susceptible to generalized anxiety disorder [7]. In particular, forced hospitalization or quarantine measures cause older adults to be exposed to anxiety disorders, depressive disorders, sleep-wake disorders, and trauma, stressor-related disorders which prolong the impact of COVID-19 [8]. Previous research reported that the recovery of psychological symptoms for older adults in quarantined circumstances are more complicated and maintained in the long-term [9]. Hence, effective ways to understand psychological distress in older adults with a history of COVID-19 who have undergone quarantine, and support their life changes are essential. The voices and perspectives of older adults with COVID-19 during quarantine measures have often been overlooked, and they are likely to experience widespread stressors in managing the COVID-19 crisis. However, given that COVID-19 is a novel disease, limited qualitative studies have been conducted to develop theories to understand the recovery process [10]. Therefore, understanding effective ways to understand their psychological health, emotional well-being, and resilience from forced restriction is essential.

Apart from previous research methods, the qualitative study using a grounded theory approach aims to provide clear guidelines for complex phenomena by linking particular constructs and developing new strategies. It enables a comprehensive understanding of the research phenomenon to develop effective intervention strategies to promote rehabilitation in times of trauma [11,12]. The purpose of this study is to explore how individuals aged 60 and above navigate their coping mechanisms during the COVID-19 crisis within the domestic sociocultural context. We aimed to understand the underlying psychological insights in the context of COVID-19 and promoting an understanding of the recovery process of older patients in critical situations. Therefore, we adopted a grounded theory approach to understand the experiences of older adults with a history of COVID-19 and lay the groundwork for developing nursing intervention programs specifically designed for older adults aged 60 and above affected by COVID-19.

METHODS

Ethic statement: This study was approved by the Institutional Review Board (IRB) of Kyungpook National University (IRB No. 2022-0320). Informed consent was obtained from the participants.

1. Study Design

The authors complied with consolidated criteria for reporting qualitative research (COREQ) guidelines. This qualitative study employed Corbin and Strauss's [12] methodology for grounded theory qualitative research, to describe the relationships between concepts that constitute the phenomenon and investigate the recovery process of older adults with a history of COVID-19. Through examining and exploring various perspectives on individuals' behaviors, researchers can scrutinize these behaviors and develop a comprehensive, situation-specific theory. Through a grounded theoretical approach, the researcher can develop a theory that can explain complex and multi-dimensional situations by exploring the experiences of older adults with a history of COVID-19.

2. Setting and Sample

A total of 15 participants were recruited based on purposive and snowball sampling. The recruitment was conducted in a way that previously recruited participants recommended subsequent participants. A total of 10 participants were recruited based on verbal referrals from participants who had previously been recruited, and the other five participants were subsequently recruited based on the recommendation of G wellness centers' staff members.

In grounded theory, participant selection is an important procedure achieved through theoretical sampling that deliberately selects appropriate study participants. Theoretical sampling is a process for researchers to determine data to collect based on analyzing prior data to decide the next collection target within a particular context [11]. According to theoretical sampling methods, subsequent data were determined based on the analysis of the characteristics, and quality of previous data. By analyzing samples intentionally collected based on concepts, researchers can discover common core concepts by extracting attributes from study participants [11,12].

Afterward, analyzed data were theoretically saturated based on continuous comparative analysis of information until new meaningful information was no longer yielded. Theoretical saturation occurs when the development of all paradigm categories becomes densely woven, and no new or related data emerges. At this stage, relationships between categories are well-established, and new meaningful information is no longer yielded [12]. We reached theoretical saturation after analyzing

data up to the 15th participant, where the data no longer yielded new concepts or themes.

Inclusion criteria included older adults aged 60 and above who had recovered and could truthfully describe their experience of being quarantined due to COVID-19. We included participants who could reflect on their experience and signed the consent form. Based on considering the recovery from traumatic experiences, we recruited participants who have been maintaining their daily lives without problems for at least one year after being quarantined [13,14]. Accordingly, we recruited participants who had been forced to quarantine due to COVID-19 from January 2021 to August 2021. In addition, we conducted a psychological test in advance provided by G wellness center to include participants for those who fall within the normal range [15]. Exclusion criteria included those with cognitive impairment or a diagnosis of post-traumatic stress disorder (PTSD) due to psychiatric stress caused by COVID-19.

3. Ethical Considerations

This study was reviewed and approved by the Ethics Committee of Kyungpook National University (No. 2022-0320). The researchers explained the study's purpose, methods, and their right to stop participating at any time without disadvantages to the participants. Their willingness was confirmed by obtaining their signatures on informed consent forms. The recorded data were kept in a password-protected file and paper-based documents in a locked cabinet.

4. Data Collection

Data collection was conducted from September 12, 2022 to February 27, 2023, by using face-to-face, individual, semi-structured interviews. As the potential risks of quarantine experiences were weighed carefully against possible distress, we interviewed three older adults with a history of COVID-19 for pilot testing in August. Previous studies have reported that PTSD related to COVID-19 can cause past trauma to suddenly appear. In addition, it causes abnormal symptoms such as suffocation [8]. All interviews were conducted in the counseling room within the hospital affiliated with the G wellness center where medical treatment was available in the event of an emergency to alleviate COVID-19-related risks. Multidisciplinary experts (nursing professors and psychologist) participated in discussions to determine the research participants. First, back-

ground information—living situations, patient history, the status of physical and mental health—was assessed to determine the study participants' availability of interviews.

Next, to build a rapport, researchers were introduced, psychological support guidelines were provided, participants' written consent was obtained, and interviews were scheduled at their convenience. Interviews (up to three sessions lasting 60 to 90 minutes per person) were conducted complying with COVID-19 safety guidelines by the research member who previously worked in a COVID-19 ward—wearing masks and temperature checks.

The researchers began the interviews by empathically asking open-ended questions and ended them by expressing appreciation for the participants' engagement. The main interview questions were "What have you been through sequentially after the infection?" and "What are your coping strategies?", "What was the most difficult part of the COVID-19 infection period?", and "What change did you feel through the COVID-19 experience?". The frequently used facilitation question was "Is there anything else you want to talk about regarding COVID-19 experience? If so, 'please tell us?'" All interviews were audio recorded. The interviewer summarized the content, asked the participants to confirm it, and made debriefing notes after each interview. Psychological guidance materials were sent after the interview to assess participants' mental states, and if applicable, post-interviews were implemented to reduce potential trauma risks.

5. Data Analysis

To identify and classify similarities and differences in data and extract distinct categories for interpretation, researchers use the constant comparison method.

First, the outline centered on psychological pain among adults with a history of COVID-19 who had been quarantined was formulated after several readings of the interviews, excluding researchers' prejudices. Transcripts were returned to participants for comment and correction. Data analysis was conducted based on Corbin and Strauss's qualitative research methodology with a grounded theory approach [12]. Thereafter, interviewers reviewed all the transcripts using the QSR NVivo11 program for open coding [16]. In data analysis, codification procedures, such as simple word-by-word and line-by-line coding, were also implemented.

Open coding is an analytical approach that involves naming

and categorizing phenomena during the initial phase of coding through close data examination. This process involved carefully reviewing and re-reviewing the raw data multiple times. Open coding enables in-depth analysis by deriving categories through event-to-event and object-to-object comparisons, along with the use of theoretical comparison techniques. Similar or different concepts were compared to derive a particular category, find and classify differences in their attributes using theoretical comparison techniques. This allowed us to group similar concepts, forming broader categories. Through open coding, specific concepts (codes, sub-themes, themes) emerged from the raw data, revealing their properties and dimensions.

In axial coding, the process involved reassembling previously distinct concepts and categories that had been derived through open coding to construct a structural framework. This framework was developed to provide a more detailed and comprehensive explanation of the phenomenon under study. Axial coding involves connecting categories through a paradigm model, including crucial elements such as causal conditions and consequences.

A causal condition refers to an event that triggers or facilitates a particular phenomenon. Contextual conditions refer to the set of circumstances or environments in which a particular phenomenon is situated. Intervening conditions within a specific context can either facilitate or inhibit the effectiveness of action/interaction strategies. Action/interaction strategies involve addressing, controlling, executing, and responding to a phenomenon. Consequences refer to the results that stem from the action/interaction strategies.

In the selective coding phase, the content at the descriptive level was developed to an abstract level. We identified a core category that represents concepts and categories. All categories were integrated around the core category using selective coding. We used this core category as the foundation to create a theory, focusing on the recovery process of older adults with COVID-19 in our study.

Afterward, process analysis was conducted to understand how participants' experiences evolved over time. A process analysis involves linking stages sequentially over time. This approach enables us to comprehend how the process evolves under the influence of variables to lead to an outcome.

6. Rigor

To enhance rigor, Guba and Lincoln's [17] criteria of truth

value, applicability, consistency, and neutrality were used. Truth value was confirmed through repeated checks and interpretations for accuracy. The interview transcripts were analyzed, and their accuracy was strengthened by obtaining the participants' reaffirmation. Applicability of the results was established by obtaining confirmations from three participants and three non-participants to enhance authenticity so that the results could be applied to a wider range of situations. Consistency was determined by theoretical comparisons. Throughout the analysis, the data and coding were regularly checked by researchers, nursing professors, and a psychologist. Neutrality was maintained by avoiding involvement/interactions between the researchers and participants. To exclude prejudices, all reflections were recorded, and the research process was noted, which helped to avoid biases.

RESULTS

The 15 participants were 60 years and older (Table 1). Six themes, 14 sub-themes, and 41 codes (Table 2) were identified.

1. Casual Condition: Potential Threats to Wellbeing

Older patients who were infected with COVID-19 faced a growing sense of anxiety about their physical and mental well-being due to the effects of confinement. Those who were isolated in hospitals witnessed COVID-19-related deaths, which made them more aware of the severity of the infection. They expressed a sense of emotional despair because they had nowhere to turn for straightforward guidance on what to do next, and they lacked outlets for emotional support. Amidst the confusion during confinement, participants were worried about the prospect of returning to society and resuming their usual lives.

1) Confusion and Disruption Caused by Many Unknown Experiences

Many participants longed for the normalcy of their pre-COVID-19 lives. Others described concerns about additional age-related COVID-19 risks. They requested support plans for older patients including psychological interventions to alleviate mental stress. Although they were confused by the disruption of their daily lives due to COVID-19 infection, they revealed that they lacked information and guidance from healthcare professionals.

Table 1. General Characteristics of Participants (*N*=15)

No.	Age bands (year)	Sex	Residential type	Employment	Signs of infection	Duration of quarantine (month)	Quarantined site for hospitalization	Types of support during quarantine
1	60s	Male	Alone	Retired	None	2	Residential treatment centers	Support from a family member
2	60s	Female	Alone	Working part-time	Yes	2	Residential treatment centers	Support from a family member
3	60s	Female	Alone	Retired	None	3	Residential treatment centers	Support from healthcare professionals
4	60s	Male	With spouse	Working part-time	Yes	2	Residential treatment centers	Support from a family member
5	60s	Male	With spouse	Working part-time	None	2	Hospital	Support from a family member
6	60s	Female	With spouse	Retired	None	2	Residential treatment centers	Indirect contact with others
7	60s	Male	With spouse	Retired	Yes	2	Residential treatment centers	Support from a family member
8	70s	Male	With spouse	Retired	Yes	3	Hospital	Support from a family member
9	60s	Male	With spouse	Retired	None	2	Residential treatment centers	Support of the government's measures
10	60s	Male	With spouse	Self-employed	Yes	3	Hospital	Indirect contact with others
11	70s	Female	Alone	Retired	None	2	Hospital	Support from a family member
12	60s	Male	With spouse	Retired	Yes	2	Residential treatment centers	Support from healthcare professionals
13	60s	Female	With spouse	Self-employed	None	2	Residential treatment centers	Support from a family member
14	70s	Male	Alone	Retired	None	3	Hospital	Support from a family member
15	60s	Male	Alone	Retired	Yes	2	Residential treatment centers	Support from a family member

Although I needed help and attempted to reach out to the relevant department, I found it challenging and lacked sufficient information on the necessary steps to take. It would be beneficial if information could be disseminated effectively, aiding older adults in coping with COVID-19. (Participant 1)

COVID-19 disrupted our daily routines and it was really hard to try and get it all set up. (Participant 2)

2) Comprehensive Restrictions in Quarantined Life

Considering their vulnerability to infectious diseases and compliance with social distancing guidelines, participants had experienced a loss of their usual routines at restricted places. Participants experienced significant challenges and setbacks in adapting their daily routines to a new normal with many fearing reductions in their radius of daily activity.

I was completely isolated. There was a huge pile of COVID-19 patient files on the COVID-19 ward, and all the medical staff was wearing protective clothing. (Participant 7)

I feared the extent of unwanted governmental privacy regulations. (Participant 11)

3) Concerns Due to End-of-Life, Aging, and Social Adjustment

In combination with pre-existing comorbidities, the majority of participants feared health risks, viewing aging and frailty as closely linked to an increased mortality rate from COVID-19.

I realized that I'm old. What I'm afraid of is that with age, I may need intubation. (Participant 1)

As I have lifelong complications, I am often put on ventilators, and a feeding tube during hospitalization. The longer this repetition lasted, the more despair overcame me. (Participant 5)

Table 2. Themes for the Recovery Process of Aged COVID-19 Patients

Paradigm element	Themes	Sub-theme	Code
Casual condition	Potential threats to wellbeing	Confusion and disruption caused by many unknown experiences	Confusion from sudden loss of normality Perplexity due to not knowing what will happen Healthcare problems in aged patients caused by the COVID-19 infection
		Comprehensive restrictions in quarantined life	Loss of leisure, lack of routine Limited radius of daily activities Grieving the loss of normality
		Concerns due to end-of-life, aging, and social adjustment	Concerns about delayed social readjustment Healthcare concerns due to prolonged reductions in physical activity Healthcare concerns due to pre-existing comorbidities
Contextual condition	Lack of support systems	The distress stemmed from financial insecurity	Deficiency of sufficient financial support Deprivation of income while being in quarantine Unfair employment opportunities due to a history of COVID-19 infection
		Suffering alone while longing for help	Anger toward spreading unofficial information about high-risk COVID-19-infected patients Mental health exacerbation caused by COVID-19's aftereffects Situation where the government is out of control
		Critical shortages in supplies during the COVID-19 recovery period	Shortage of multidisciplinary healthcare professionals Concerns about deficiency of psychological support, food, and financial insecurity Deficiency of rehabilitation programs and support for protecting the well-being
Central conditions	A life shattered amidst COVID-19-related helplessness	Deepening agony caused by prolonged COVID-19 recovery period	Hierarchical quarantine policy that just require acceptance Suicidal impulse due to accumulating stress from COVID-19 Deficiency of interpersonal relationships and alienation
		The burden of living in distressing circumstances	Exacerbation in mental health related with COVID-19 Feeling of inferiority and loss of confidence Image-denting rumors and stigmatization
Intervening conditions	Rebound for change	Gratitude toward those providing strength to endure difficult situations	Gratitude toward family members Gratitude toward other support groups and recovery programs Religious gatherings and faith-based practices
		Planning for the present and future	Estate planning and contingency plans Strategic thinking in preparation for end of life
Action/Interactional strategies	Development of efficient coping strategies	Reciprocal offers of support	Sewing masks, baked and cooked for others Donating money and goods Supporting COVID-19 care-givers
		Development of COVID-19-related response strategies	Accessing practical resources Maintaining nutrition and healthcare Maintaining mental wellness
Consequences	Fostering resilience after life-threatening incidents	Acceptance of changed daily life	Increases in sedentary physical activity Using social media or chat rooms Learning something new or take a course for the future
		Establishing a new mindset and priorities in one's life	COVID-19 period as of time for re-balancing Trying to live in the present moment with positivity Search for unanticipated benefits of COVID-19

COVID-19=Coronavirus disease 2019.

I'm worried about whether I can adapt like before COVID-19 because I've lost contact with people and I haven't had any social exchanges for months. (Participant 13)

2. Contextual Condition: Lack of Support Systems

Many people found themselves spending time in self-isolation, using COVID-19 self-test kits to determine if they were positive or negative. The limitations on social interactions during isolation also resulted in unavoidable financial losses. When trying to access economic assistance, they mentioned that the government's eligibility criteria were complicated, making it challenging to qualify. Moreover, government guidelines have undergone frequent changes, and officials in charge have often been unreachable by phone. It was common that temporary support was sometimes offered but then abruptly disappeared. Older patients, in particular, required more support than younger individuals, yet aside from isolation, they received minimal assistance.

1) The Distress Stemmed From Financial Insecurity

Most participants expressed significant emotional distress due to not receiving adequate living allowances. The financial assistance provided to offset the impact of the COVID-19 quarantine was insufficient to cover the size of the loss incurred during the quarantine period.

Due to old age and the stigma associated with being infected with COVID-19, participants also experienced difficulties in returning to their previous jobs and faced rejection while searching for new employment. Participants experienced insufficient income while under quarantine and struggled with the burden of sustaining their livelihoods.

I did not receive any financial support during my quarantine due to COVID-19. I've been quarantined for a long time, I'm concerned about not having enough funds for use once I'm released. (Participant 8)

I'm looking for a new job, but my previous company rejected me due to my history of COVID-19 infection. Moreover, the rumor that I was infected with COVID-19 and quarantined seems to have a negative impact on my job search. (Participant 11)

2) Suffering Alone While Longing for Help

The participants found that they were socially stigmatized

for being infected with COVID-19 and were psychologically wounded by constant stories about groups with COVID-19, even after their release from quarantine. Participants felt that, in reality, it is difficult to receive tangible help, and they ultimately believed they had to manage everything on their own.

People do not approach me because of the prejudice that it is transmitted more quickly from older adults infected with COVID-19. (Participant 8)

I had hoped the number of places where I could consult would increase while restricted. (Participant 15)

3) Critical Shortages in Supplies During the COVID-19 Recovery Period

Inadequate support from healthcare professionals and rehabilitative programs, and the lack of essential supplies worsened the predicament causing significant physical and emotional stress for older patients. Participants often mentioned experiencing sudden emotional changes, such as anxiety and depression. They believed that having more outlets for receiving kind words and emotional support would help them find emotional stability.

I didn't get enough necessities and financial support needed for my daily life. It took a long time to receive them. There was no emotional connection either. (Participant 8)

When I felt helpless, I hoped I could talk with healthcare workers or use rehabilitation services. The harder the situation was, the more desperately I needed someone to rely on. (Participant 2)

3. Central Phenomenon: A Life Shattered Amidst COVID-19-Related Helplessness

Participants expressed stress during their COVID-19 recovery period, which lasted for more than a month. The majority of participants reported that they had to comply with a hierarchical quarantine policy that just required acceptance within a confined environment, limiting freedom of expression. Some participants mentioned experiencing extreme stress and suicidal impulses because of the adverse situation they experienced due to COVID-19. Participants reported experiencing personality changes in a negative direction. They also faced a lack of interpersonal relationships, along with damaging rumors and stigmatization related to COVID-19. The social stig-

ma associated with contracting COVID-19 led to feelings of insignificance and a loss of confidence, contributing to participants' sense of alienation from acquaintances after their release from quarantine.

1) Deepening Agony Caused by Prolonged COVID-19 Recovery Period

The government imposed residential restrictions and enforced isolation from acquaintances during the recovery period, all justified by the need to prevent further virus spread. Most of the participants confessed that it was hard to recall their experiences in quarantine facilities which they were unable to escape from. This situation, coupled with uncertainty about their futures, led to elevated levels of depression and diminished self-esteem. In some cases, participants even contemplated extreme actions like suicide, feeling as if they were pushed to the edge of their lives

Tears began to flow as I found myself compelled to take unwanted medication and undergo periodic blood pressure checks by the medical staff in the isolation room consistently. (Participant 8)

I often experienced nightmares, and negative thoughts plagued my mind, leading to overwhelming despair. Sometimes, I felt the desire to die whenever the painful memories emerged. (Participant 10)

After the COVID-19 infection, the shift to a completely non-face lifestyle led to feelings of isolation and emptiness, with limited opportunities for in-person social interaction. There were days when everything felt monotonous, and I lacked someone to have a conversation with. (Participant 11)

2) The Burden of Living in Distressing Circumstances

They expressed their distress about being confined to limited spaces with very limited engagement they could do due to the sudden changes in their daily lives. They experienced a sense of insignificance and a loss of confidence. The confined situation combined with image-denting rumors and stigmatization evoked severe fear, leaving their mental well-being in a fragile state.

I was mentally exhausted, discouraged, and had lost confidence in living due to the prolonged distressing situation associated with COVID-19. It felt like I was insignificant. (Participant 5).

People avoid approaching me due to the prejudice that COVID-19 is particularly contagious among older adults with a history of the virus. Consequently, I felt alienated by acquaintances around me. (Participant 8)

4. Intervening Condition: Rebound for Change

Support and encouragement from religion and family have been instrumental in their lives, serving as strong pillars and sources of motivation. They've also come to rely on external support, which has strengthened their belief that they can overcome challenges. Due to their old age, some participants made financial arrangements to prepare for the potential worsening of their health. They also devised temporary solutions in anticipation of health decline. They focused on healing their minds and souls while taking care of their physical and mental well-being as part of their journey to recover from the consequences of the COVID-19 infection.

1) Gratitude Toward Those Providing Strength to Endure Difficult Situations

They ascribed regaining their vitality to the efforts of support groups, rehabilitation programs and found solace through family. In the participants' lives, the encouragement from friends and the support of their families served as reliable pillars and sources of motivation. Participants faced challenging emotions like anxiety, fear, insomnia, increased suspicion, reduced engagement in external activities, and feelings of helplessness due to COVID-19. To cope with these difficult emotions, they sought to confide in and communicate with trusted family members, friends, and people in their surroundings.

I'm thankful to my wife who selflessly assisted me by taking care of even the smallest things, enabling me to concentrate solely on my recovery. (Participant 6)

I attend counseling programs via Zoom and find it extremely helpful to share with others. Social media and chat rooms were ways to connect with community members. (Participant 12)

2) Planning for the Present and Future

Participants' coping strategies in response to the crisis are based on years of accumulated experiences and contingency plans according to the present situation. They were determined not to forget the lessons learned from their past experiences

and to strive for a better life than they have now. Simultaneously, few were prepared for the future by making provisions for their families, such as inheritance planning in case of unexpected circumstances.

Coping strategies included making plans for sickness and sharing wishes. I want my family to know my wishes and inheritance documents related to the end of my life. (Participant 9)

To protect my wife, I set up a contingency plan in case I die from COVID-19 by reviewing and writing estate plans, wills, and medical care directives. (Participant 6)

5. Action/Interaction Strategies: Development of Efficient Coping Strategies

Through the experiences they've had in life, the participants have fluently developed effective strategies for dealing with difficult situations. They found a sense of purpose and belonging through volunteer activities and charitable contributions after being infected with COVID-19 to overcome feelings of helplessness. Additionally, during the quarantine period, they engaged in indoor exercises, sought online counseling to relieve anxiety and loneliness, and explored various activities like internet searches, and music via their smartphones. Some even reached out to mental health professionals through online. Joining online forums to ask health-related questions and seek answers became a common practice.

1) Reciprocal Offers of Support

Participants' coping strategies included using the COVID-19 support platforms to feel purposeful and help others. Regular volunteer activities proved to help relieve the stress experienced by participants. The relationships formed through volunteer work sometimes lasted for more than a year and also served as a window for information exchange with the world. Despite their physical ailments, participants felt a sense of mind control, knowing that they could contribute to society, which made them feel like they were free of under COVID-19-infected situation.

I've just been trying to keep busy by donating goods to the neighborhood. I'm restricted due to COVID-19, but fulfilled by donating to others. (Participant 14)

I've contacted elected officials by volunteering on political campaigns by posting on social media to offer support and

reassurance in expanding support for COVID-19 caregivers. (Participant 11)

2) Development of COVID-19-Related Response Strategies

Physical and mental health were important priorities. Some participants approached mental wellness centers in times of difficulty. Conducting activities was described as an effective coping strategy. Participants took online courses, learned how to use multimedia devices, and diverted their attention from the disease through hobbies. Researchers and community healthcare providers have provided the acquisition of coping skills to older patients, continue improving their awareness, and investigate their responses during recovery.

After being diagnosed with COVID-19, I reached out to crisis helplines and community psychiatric support for assistance with depression and recovery from the extended illness. (Participant 10)

Focusing on the activities helped me. Getting projects started and completed has been instrumental in the rehabilitation period. (Participant 6)

6. Consequences: Fostering Resilience After Life-Threatening Incidents

The COVID-19 crisis experience has brought about a shift in thinking, allowing individuals to discover positive aspects even within the crisis itself. They also experienced the satisfaction of persevering and achieving something even in the face of adversity.

1) Acceptance of Changed Daily Life

Participants faced challenges of finding "equivalent" activities to maintain their physical activity routines. Time spent in sedentary activities increased after COVID-19's onset. The wisdom and insight of older adults, accrued from various life experiences, acted as an important positive factor in their adaptation. Most participants gradually sought their own leisure and peace of mind as they embraced the inevitable reality in their daily lives. They appeared to experience the major life-threatening event more positively and willingly adjusted to their situation.

I discovered a new way to do yoga without spending money on gym. I'm spending much time on joining online yoga classes. (Participant 3)

I was looking at alternatives to keep active. Home improvement projects have been instrumental in my sanity. This keeps my mind busy and off of trace of COVID-19. (Participant 12)

2) Establishing a New Mindset and Priorities in One's Life

Changing one's perspective of the COVID-19 crisis and regarding it as an opportunity to overcome adversity were important factors in the adaptation process.

I think... there are some little positive benefits. I'm not rushing around so much anymore, it's given me the time and the opportunity to notice small things. (Participant 9)

I cherish this moment and try to live faithfully in the present. I learned to live with considerable challenges with patience while dealing with crises. "Every cloud has a silver lining" (Participant 7)

7. Process Analysis

The core category revealed was turning crisis into opportu-

nities throughout making meaning of living in the time of COVID-19. Although time cannot heal all wounds, it allows participants to experience events, form new perspectives, and reorient for the future. Participants reflected on their lives and became stronger by enduring various aspects of pain related to COVID-19. Acknowledging the unavoidable and reorienting to changes were identified as the core categories, with the strategic coping process comprising three stages: recognition of crisis, seeking a way out, and fostering resilience (Figure 1).

1) Recognition of Crisis

Participants said they felt fear as a representative after-effect of COVID-19. The unprecedented global epidemic has been life-threatening because there is no treatment other than vaccination. The stigmatization of groups for COVID-19 infection has intimidated participants. Participants confessed that they did not know how to cope with the aftereffects of COVID-19 infection and protect themselves. Moreover, they experienced pain caused by the various inevitable changes in their lives and the guilt that negatively affected their families.

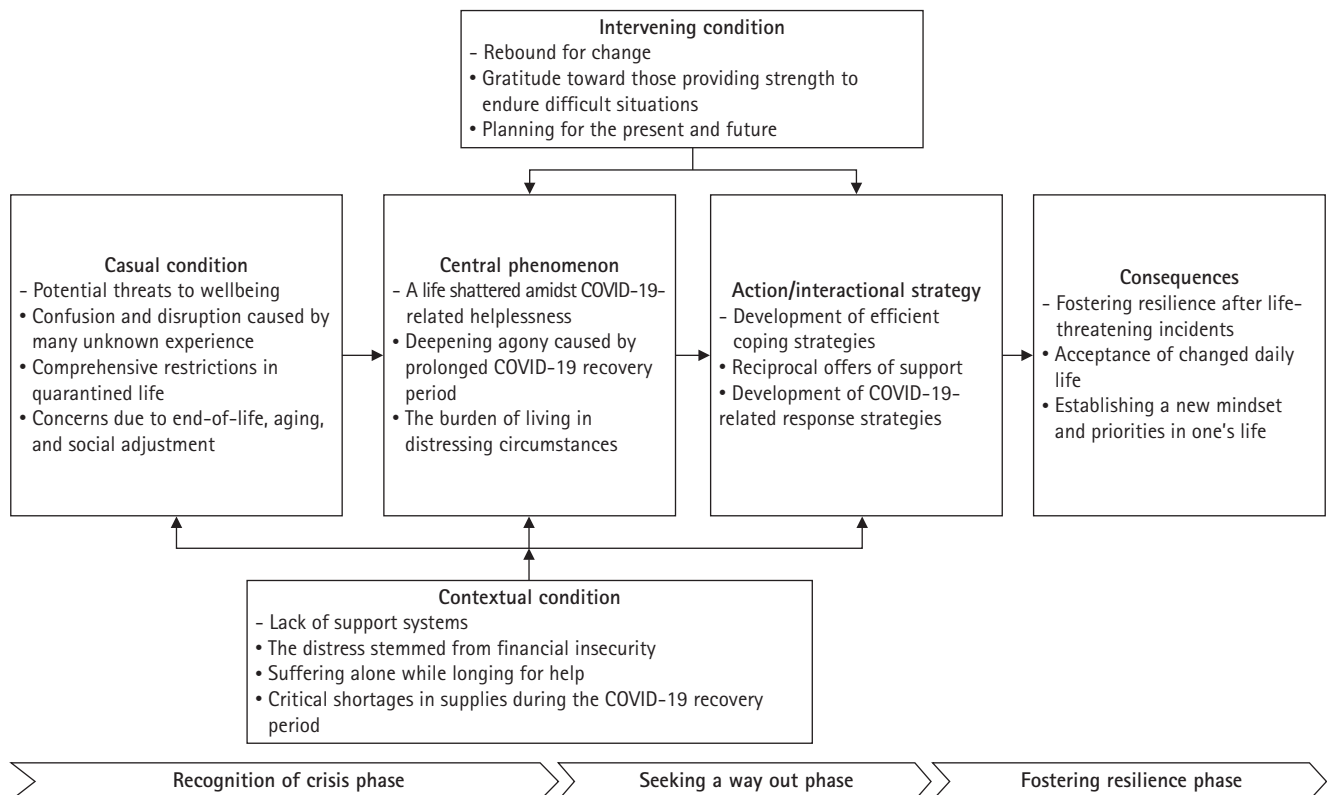


Figure 1. Turning crisis into opportunities throughout making meaning of living in the time of COVID-19 pandemic.

2) Seeking a Way Out

Some participants acknowledged it was important to comply with COVID-19 regulations, even though these regulations were unbearable in daily life. Assuming a relaxed attitude toward the disease, ensuring they received appropriate rest, and volunteering were activities that reinvigorated participants, and helped them establish a daily routine.

3) Fostering Resilience

Participants occasionally experienced feelings of unease as a consequence of using various coping strategies. However, with time, they gained resilience while dealing with the emotional turmoil caused by the COVID-19 infection, and accepted the inevitable changes. Participants found peace of mind and increased their quality of life by designing a long-term plan and not dwelling on the current crisis.

DISCUSSION

This study utilized Corbin and Strauss's grounded theory approach to explore the recovery process of older patients who have experienced forced quarantine.

In the casual condition, potential threats to wellbeing during COVID-19 emerged as upper themes. Studies found negative psycho-social health consequences, including anxiety, depressive symptoms, social isolation, and loneliness due to the disease's unprecedented circumstances [18,19]. Congruent with international research, most of this study's participants reported confusion from the sudden loss of normality, not knowing what would happen, and healthcare problems during COVID-19 recovery [20]. This suggests that adequate guidelines must be provided to alleviate confusion by the aftereffects of COVID-19. Some participants were concerned about their COVID-19 infection and its complications affecting their pre-existing health conditions, and leading to death. Healthcare professionals should consider unique characteristics like aging and frailty of older adults with COVID-19, and provide adequate support.

In the contextual condition, lack of support systems for older patients emerged as upper themes. We found that participants experienced distress that stemmed from financial insecurity and suffering alone while longing for help during the COVID-19 recovery period. Older adults with a history of COVID-19 suffered alone due to long-term quarantine, mental health exacerbation, challenges in accessing adequate information to cope with crises, and a deficiency of vital supplies

that were out of stock. The deprivation of income, reduced social opportunities, and unfair employment opportunities due to a history of COVID-19 infection were frequently shown to adversely affect the rehabilitation and integration into society for adults with a history of COVID-19 [21]. This situation made it especially challenging for older patients, as they had to navigate through the ongoing and unpredictable nature of the COVID-19 crisis with limited resources. In this regard, a phone line or online service, managed by healthcare providers and subsidies specifically designated for older adults recovering from COVID-19, could offer information to reassure patients, thereby facilitating their reintegration into society. Moreover, this suggests that healthcare professionals must provide a continuous provision of medical supplies and standardized guidelines to ensure that older patients respond appropriately to the changed environment.

In the central phenomenon, a life shattered amidst COVID-19-related helplessness emerged as an upper theme. Participants were psychologically burdened by negative social biases and struggled to accept that they were infected with COVID-19. In this regard, previous studies have mentioned widespread discrimination against older adults with a history of COVID-19 [22]. This emphasizes the need to educate the general public to prevent the spread of misinformation and misconceptions about COVID-19. Individuals who were alienated or quarantined in the COVID-19 recovery period often experience chronic mental illness while recovering from this life-threatening experience [23]. This implies the significance for public healthcare professionals to adopt a therapeutic communication approach, as psychological support has the potential to gradually alleviate feelings, such as fear, worry, and suicidal thoughts. The unspecialized, top-down, and authoritative guidelines also implied a need for a stronger social safety net. Therefore, it is crucial to establish structural measures for the continuous monitoring of older patients who have faced the COVID-19 crisis, and structural efforts are needed to assist them during their COVID-19 recovery period.

In the intervening condition, reframing one's value for life, and encouraging specific strategies to cope with adversities emerged as upper themes. A previous study stated that family and social support served as psychological pillars in overcoming the COVID-19 crisis [24]. A previous study found that most older adults with a history of COVID-19 believed that an appropriate social support system played an important role in coping with crises [25]. This study found that the participants'

accumulated experience and life wisdom served as a buffer, allowing them to accurately recognize the current difficulties and overcome uncertain situations [26]. Therefore, health professionals must focus on older adults with a history of COVID-19, employing secondary strategies to adjust their outlook on planning for different scenarios to accommodate future uncertainties.

For coping, life adjustment, and rehabilitation, participants voluntarily developed action-interactional strategies. A previous study indicated that most older adults with a history of COVID-19 tried to overcome the crisis by focusing on something socially contributable, which played a decisive role in responding to the crisis [26,27]. This study also found interpersonal contact, such as receiving and providing social support, to be a factor influencing stress reduction in older adults with a history of COVID-19. These findings imply that well-established reciprocal support systems play a central role in this population to flexibly adapt to the new environment.

As a consequence of utilizing action-interactional techniques, participants gradually fostered resilience. Moreover, studies have shown that older adults with a history of COVID-19 tried to reevaluate their life priorities and gradually readjusted and accomplished achievable goals while coping with challenges [28]. Most participants regained stability and calmness while controlling the situation in using the latest online devices or encouraged them to find indoor alternatives to their usual outdoor physical activities [29]. Accepting changed situations and maintaining positive self-esteem play a crucial role in fostering resilience [30]. These results show that each patient's personalized psychological experience should be monitored by healthcare professionals to support them aptly for recovery in response to changed situations.

This study's strength is that it described unique contexts of the experiences of older adults with a history of COVID-19. This study also has limitations. In this qualitative study focused on an in-depth exploration of the experiences of a small sample. As data could not be collected from a broader geographical area owing to COVID-19 restrictions, the results may not be applied to other patients. Therefore, the findings must be interpreted cautiously to trace further effects among older patients with COVID-19.

CONCLUSION

This study provides a comprehensive and in-depth under-

standing of the recovery of older COVID-19 patients who were quarantined. It's evident that these individuals grapple with physical, emotional, and social challenges, all while adapting to changes in their daily lives. We observed that although negative emotions were prevalent at the outset, the deployment of coping mechanisms and psychological maturation played vital roles in the growth to maintain their mental well-being after their quarantine period. Findings offer valuable recommendations for health experts for older patients with COVID-19. We encourage healthcare professionals to provide better healthcare by understanding the experience of their psychological recovery process.

ORCID

Hee-Sook Kim, <https://orcid.org/0000-0002-8669-0166>

Jae Wan Park, <https://orcid.org/0000-0001-8594-7874>

Authors' contribution

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

Conflict of interest

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

Funding

None.

Data availability

Please contact the corresponding author for data availability.

Acknowledgements

We thank interdisciplinary healthcare professionals for analysis and interpretation of the data and supervising the manuscript. We also thank all study participants.

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간호간병통합서비스병동 간호사의 섬망 간호지식과 섬망 간호 수행 자신감이 섬망 간호 수행에 미치는 영향: 횡단적 서술적 조사연구

김호영¹, 김수올^{2,*}

¹가톨릭대학교 의정부성모병원 선임간호사, ²광주여자대학교 간호학과 조교수

The effect of nurses' knowledge and self-confidence on delirium nursing performance of nurses in an integrated nursing and caring services ward: A cross-sectional descriptive study

Ho Yeong Kim¹, Su Ol Kim^{2,*}

¹Senior Nurse, The Catholic University of Korea Uijeongbu St. Mary's Hospital, Uijeongbu, Korea

²Assistant Professor, Department of Nursing, Kwangju Women's University, Gwangju, Korea

Received: October 17, 2023

Revised: December 4, 2023

Accepted: February 7, 2024

Corresponding author:

Su Ol Kim

Department of Nursing, Kwangju
Women's University, 61
Gwangjuyeodae-gil, Gwangsan-gu,
Gwangju 62396, Korea
TEL: +82-62-950-3895
E-mail: teddy627@hanmail.net

*Current affiliation: retirement.

Purpose: This study was conducted to investigate the impact of delirium knowledge and delirium nursing confidence on delirium nursing practice among nurses working in an integrated nursing and caring services ward. **Methods:** This descriptive study included 102 registered nurses with a minimum of 6 months of professional experience from the integrated nursing and caring services ward of a university hospital in Uijeongbu City. Data were collected from May 10, 2023 to July 5, 2023 and were subjected to independent samples t-test, one-way analysis of variance, Pearson's correlation coefficient, and multiple regression analysis using the SPSS/WIN 27.0 program. **Results:** Delirium nursing knowledge was positively correlated with delirium nursing confidence ($r=.25, p=.01$). Delirium nursing confidence was positively correlated with delirium nursing performance ($r=.41, p<.001$). Factors influencing delirium nursing performance were delirium nursing confidence ($\beta=.32, p=.001$), marital status ($\beta=.21, p=.016$), and delirium education experience ($\beta=-.19, p=.032$). The model used in this study explained 27% of the variance in delirium nursing performance (adjusted $R^2=0.27, F=8.46, p<.001$). **Conclusion:** This study identified factors that influence delirium nursing performance of nurses in an integrated nursing and caring services ward in a university hospital. Based on the findings, delirium nursing education programs should include strategies that can improve delirium nursing confidence. Further research is needed to confirm the effectiveness of developing a delirium nursing practice improvement program and guideline that reflects the characteristics of integrated nursing and caring services wards.

Keywords: Delirium; Nurses; Self concept; Education; Knowledge

서론

1. 연구의 필요성

한국의 65세 이상 노인인구는 2022년 17.5%로 2070년에는 46.4%로 높아질 것으로 전망된다[1]. 섬망은 노인환자의 사망률과 이환율 증가, 요양시설로의 입소 등 막대한 사회적 비용을 발생시키고[2] 섬망을 진단받은 노인환자의 1년 이내 사망률은 38%~41%로 예후가 나쁘다[3]. 입원중인 노인 환자의 30%~50%가 섬망을 경험하고 실제 노인 환자의 섬망 유병률은 가장 높은 것으로 나타났다[3,4]. 섬망은 환경에 대한 인식저하를 수반하는 주의력 혼란으로 특징지어지는 가역적인 급성 의식 손상으로 정의되며 몇 시간에서 며칠 사이의 짧은 기간에 걸쳐 발생하고 기억력 결손, 지남력장애, 언어, 시간공간능력, 지각에 대한 추가적인 인지장애를 동반한다[3]. 또한 영구적인 인지장애와 치매로 이어지며 낙상, 욕창, 기능저하, 요실금 등으로 인해 많은 비용이 발생하게 되므로 섬망의 예방적 중재를 포함한 섬망 간호의 중요성이 강조되고 있다[5].

섬망의 입원 전 선행요인으로는 고령, 인지장애 과거력, 패혈증, 심혈관질환, 노쇠, 음주, 흡연, 고혈압 등이 있다[6]. 입원 후에 병원에서 획득되는 유발 요인으로는 약물적 요인과 환경적 요인, 그리고 그 외로 부동, 통증, 기계적 환기, 병의 중증도 등 그 요인이 다양하고 복합적으로 작용한다고 밝혀졌다[6]. 섬망의 약물적 중재에 대한 연구로는 dexmedetomidine, 그리고 항정신병약물인 quetiapine과 olanzapine 등이 섬망의 증상, 중증도, 발생기간의 개선에 효과적일 수 있다고 밝혀지고 있으나 Food and Drug Administration에서 공식적으로 승인한 섬망에 대한 약물은 없다[7]. 반면에 비 약물적 중재방법으로 구성된 Hospital Elder Life Program이 200개가 넘는 병원에서 섬망을 예방하는 데 유의한 효과가 있는 것으로 보고되고 있어 간호사의 비약물적 섬망 간호 중재의 중요성이 확인되었다[8].

간호간병통합서비스란 보건의복지부령으로 정하는 입원 환자를 대상으로 보호자 등이 상주하지 않고 간호사, 간호조무사, 간병지원인력에 의하여 포괄적으로 제공되는 입원서비스를 말한다[9]. 간호간병통합서비스제도는 2016년 9월 30일 시행되어 2022년 11월 말 기준 국내 635개 병원, 69,753병상으로 점차 확대되어 운영하고 있다[10]. 간호간병통합서비스제도의 시행으로 간호사의 직접 간호 시간이 증가하게 되었으며[11] 간호사가 환자의 곁에서 보내는 시간이 많을수록, 섬망 간호 중재를 제공할수록 섬망 발생률이 유의하게 감소하므로[8] 이러한 제도는 긍정적 효과를 가져왔다. 반면 대학병원의 일반병동 간호사를 대상으로 조사한 결과 섬망 환자를 간호할 때 어려움을 겪었다고 대답한 간호사의 비율은 81.6%로 높게 나타났으며[12] 섬망 환자를 돌보느라 다른 업무가 지연되거나 섬망 환자가 침습적 장치를 스스로 제거할 때 간호사가 받는 스트레스 정도가 높은 것으로 보고되었다[13]. 또한 섬망 간호 제공 시 간호사가 받는 스트

레스 정도는 일반병동 간호사[12]보다 중환자실 간호사[13,14]가 낮았다. 이러한 결과는 보호자를 상주시켜 환자에게 정서적 지지가 가능한 일반병동의 환경적 특성이 원인이 될 수 있으며[12] 보호자 상주가 허용되지 않는 간호간병통합서비스병동 간호사를 대상으로 한 연구가 필요하다.

간호사가 섬망환자를 사정하고 조기 발견하는 데 핵심적인 역할을 하는 의료인임에도 불구하고[8] 국내의 선행연구를 살펴보면 대학병원 병동 간호사 중 섬망 관련 교육을 받은 간호사보다 섬망 관련 교육회차가 전혀 없었던 간호사의 비율이 과반수를 넘고[12] 간호사는 섬망에 대한 지식이 부족하며[15] 섬망 사정 정확도가 낮은 것으로 보고되었다[16]. 섬망 관련 지식이 높을수록 섬망 간호 수행도가 높아진다[17]는 연구결과가 있으나 섬망에 대한 지식수준이 간호 수행에 영향을 미치지 않는다는 연구결과도 있다[14].

섬망 간호 자신감은 간호사가 섬망 환자를 돌볼 때 적절한 간호를 수행할 수 있다는 스스로의 믿음을 의미한다[18]. 섬망 간호 자신감과 섬망 간호 수행도 사이에 유의한 상관관계가 있다는 연구[14,19,20]가 있으나 섬망 간호 수행도에 영향을 미치는 지식이나 스트레스에 대한 연구에 비해 아직 부족한 실정이다.

보호자 없이 간호사가 환자를 전적으로 돌보는 중환자실과 비슷한 환경에서 한 명의 간호사가 다수의 환자를 돌보는 일반병동의 시스템으로 운영되고 있는 간호간병통합서비스병동이 전국적으로 확대 시행되고 있는 현시점에 섬망 관련 지식, 섬망 간호 자신감, 섬망 간호 수행의 상관관계에 관한 선행연구는 종합병원 간호사[19,20], 종합병원 중환자실 간호사[14]를 대상으로 수행되었으나 간호간병통합서비스병동 간호사를 대상으로 연구한 경우는 찾아볼 수 없었다.

이에 본 연구는 간호간병통합서비스병동 간호사를 대상으로 섬망 관련 지식, 섬망 간호에 대한 자신감, 섬망 간호 수행 정도를 파악하고, 섬망 관련 지식 및 섬망 간호 자신감과 섬망 간호 수행 간의 관계를 규명하여 효율적인 섬망 교육 프로그램을 계획하는 데 기초자료를 제공하여 간호사들이 임상에서 질적으로 높은 섬망 간호 수행을 하는 데 도움이 되고자 한다.

2. 연구 목적

- 1) 간호간병통합서비스병동 간호사의 일반적인 특성을 파악한다.
- 2) 간호간병통합서비스병동 간호사의 섬망 관련 지식, 섬망 간호 자신감, 섬망 간호 수행의 정도를 파악한다.
- 3) 간호간병통합서비스병동 간호사의 일반적인 특성에 따른 섬망 간호 수행도의 차이를 파악한다.
- 4) 간호간병통합서비스병동 간호사의 섬망 관련 지식, 섬망 간호 자신감, 섬망 간호 수행도의 상관관계를 파악한다.
- 5) 간호간병통합서비스병동 간호사의 섬망 관련 지식, 섬망 간호 자신감이 섬망 간호 수행도에 미치는 영향을 파악한다.

연구방법

Ethic statement: This study was approved by the Institutional Review Board (IRB) of The Catholic University of Korea Uijeongbu St. Mary's Hospital (IRB No. UC23QISI0013). Informed consent was obtained from the participants.

1. 연구설계

본 연구는 간호간병통합서비스병동 간호사를 대상으로 간호사들의 섬망 관련 지식과 섬망 간호 자신감, 섬망 간호 수행 정도를 파악하고 섬망 관련 지식, 섬망 간호 자신감이 섬망 간호 수행에 미치는 영향을 알아보고 이들의 관계를 분석하기 위한 서술적 조사연구이다. 이 연구는 Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) 보고 지침(<http://www.strobe-statement.org>)에 따라 기술하였다.

2. 연구 대상

연구대상은 경기도 소재의 700병상 이상의 가톨릭대학교 의정부 성모병원 간호간병통합서비스병동에서 근무하는 간호사 102명이었다. 환자와 의사소통을 할 수 있는 능력이 되고 섬망 환자를 돌본 경험에 있는 대상자의 선정을 위해 근무경력 6개월 이상의 간호사를 대상으로 한다. 연구대상자 수는 G*Power 3.1.9.7를 사용하여 산출하였으며, 유의수준 .05, 검정력 .80, 효과크기 .15, 서술적 상관관계 연구를 위해 예측변수 5개로 하여 다중회귀분석을 위한 연구에 필요한 최소 표본 수는 92명으로 탈락률 15%를 고려하여 106명이었다. 총 106부의 응답이 수집되었으며, 작성이 불완전한 4부를 제외한 102부가 최종적으로 자료분석에 사용되었다.

3. 연구도구

1) 섬망 관련 지식

섬망 관련 지식은 Cho [21]가 개발하고, Suh와 Yoo [13]가 수정·보완한 도구를 암환자 섬망 가이드라인 내용을 바탕으로 Park과 Gu [22]가 수정·보완한 도구로 섬망 위험 요인 14문항, 섬망 사정 5문항, 섬망 증상 11문항, 섬망 중재 15문항, 결과 2문항의 총 47문항으로 구성되었다. 각 문항에 대하여 '예', '아니오', '모른다'의 항목에 표시하도록 하였으며 정답 1점, 오답 또는 모른다 0점으로 점수가 높을수록 지식 정도가 높은 것을 의미한다. Park과 Gu [22]의 연구에서 도구의 신뢰도는 Cronbach's $\alpha = .83$ 이었으며 본 연구에서 신뢰도는 Cronbach's $\alpha = .74$ 였다.

2) 섬망 간호 자신감

섬망 간호 자신감은 Akechi 등[18]이 개발한 'Self-confidence in Caring for Patients with Delirium (SCPD)' 도구를 Kim과 Lee [23]가 번역 및 수정 보완한 도구를 사용하였다. 섬망 조기발견, 원인파악, 섬망 검사법, 섬망 영향, 간호계획, 약물치료법, 환경관리, 약물치료를 받는 섬망 환자의 모니터링, 수술 후 섬망 간호, 말기암 섬망 환자의 간호에 대한 자신감 각 1문항, 섬망에 대한 설명 관련 2문항, 섬망 구별법 3문항으로 이루어졌다. 각 문항당 '전혀 자신감 없음' 0점에서 '매우 자신감 있음' 100점까지 점수를 매기도록 하였으며 점수가 높을수록 섬망 환자에 대한 간호 수행 자신감이 높음을 의미한다. Kim과 Lee [23]의 연구에서 신뢰도는 Cronbach's $\alpha = .96$ 이었으며 본 연구에서 신뢰도는 Cronbach's $\alpha = .95$ 였다.

3) 섬망 간호 수행도

섬망 간호 수행도는 Cho [21]가 개발하고 Suh와 Yoo [13]가 수정·보완한 도구를 Park과 Gu [22]가 수정·보완한 도구로 섬망 예방에 관련된 위험요인 사정 5문항과 섬망 환자에게 행하는 간호 수행 20문항의 총 25문항이다. 각 문항에 대하여 '거의 수행하지 않는다' 1점, '가끔 수행한다' 2점, '자주 수행한다' 3점, '항상 수행한다' 4점으로 응답하게 하였으며 점수가 높을수록 섬망에 대한 간호 수행도가 높은 것을 의미한다. Park과 Gu [22]의 연구에서 신뢰도는 Cronbach's $\alpha = .74$ 였으며 본 연구에서 신뢰도는 Cronbach's $\alpha = .88$ 이었다.

4. 자료 수집

본 연구는 경기도 가톨릭대학교 의정부성모병원의 간호행정부서에 연구계획서와 연구윤리심의위원회 Institutional Review Board (IRB) 승인 확인서를 제출하고 연구의 목적과 내용을 설명하여 연구 승인 및 협조를 구하였다. 4개의 간호간병통합서비스병동을 직접 방문하여 병동 책임자에게 연구목적과 자료수집방법에 대해 구체적으로 설명하고 대상자모집 광고문을 전달하고 참여를 독려하기 위해 해당 부서원 전원에게 핸드크림을 제공하였다. 자료수집 기간은 2023년 5월 10일부터 2023년 7월 5일까지였다. 대상자는 간호사 휴게실에 부착된 대상자모집 광고문 내 QR코드를 통해 온라인 설문 페이지로 접속하여 무기명으로 작성한 후 제출버튼을 클릭하여 제출할 수 있도록 하였다. 수집한 설문지는 연구자가 온라인으로 회수하였다.

5. 자료 분석

수집된 자료는 SPSS ver 27. 프로그램(IBM Corp.)으로 분석하였으며 구체적 분석방법은 다음과 같다.

- 1) 연구대상자의 일반적인 특성과 섬망 관련 지식, 섬망 간호 자신감, 섬망 간호 수행도는 빈도와 백분율, 평균과 표준편차를 이용하여 분석하였다.
- 2) 연구대상자의 일반적 특성에 따른 섬망 간호 수행도의 차이는 t-test, ANOVA를 이용하여 분석하였다.
- 3) 섬망 관련 지식, 섬망 간호 자신감, 섬망 간호 수행도의 상관관계를 파악하기 위해 Pearson's correlation coefficient를 이용하여 분석하였다.
- 4) 섬망 간호 수행도에 미치는 영향은 다중회귀분석을 이용하여 분석하였다.

6. 윤리적 고려

본 연구는 연구대상자 보호를 위해 연구를 시작하기 전 경기도 가톨릭대학교 의정부성모병원의 연구윤리심의위원회(IRB) 승인을 받은 후 진행하였다(IRB No. UC23QISI0013). 온라인 설문조사 전 연구자는 연구대상자에게 연구 제목, 연구 목적, 연구대상자 기준, 연구참여 절차, 자료의 익명성 및 비밀보장에 대한 내용을 제공하였다. 또한 본 설문은 연구목적으로만 사용할 것이며 연구 도중 철회가 가능하며 무기명으로 진행되어 연구대상자의 익명성이 보장됨을 설명하였다. 제출된 온라인 설문 응답은 별도의 코딩화된 데이터로 보관하고 관련 문서는 연구자의 암호화된 컴퓨터에 수집된 날로부터 3년간 보관 후 복원 불가능한 방법으로 폐기할 것이다.

연구결과

1. 연구대상자의 일반적 특성

연구대상자의 평균연령은 31.42 ± 5.76 세로 20대가 48명(47.1%)으로 가장 많았다. 성별은 여성이 95명(93.1%)으로 대부분을 차지했고 최종학력은 대학교 졸업 84명(82.4%), 전문대학 졸업 11명(10.8%), 대학원 졸업 7명(6.9%)의 순으로 나타났다. 결혼상태는 미혼인 대상자가 64명(62.7%)이었으며 총 임상경험 평균 경력은 7.38 ± 6.30 년으로 5년 미만 42명(41.2%), 5년 이상 9년 미만 34명(33.3%), 10년 이상 26명(25.5%) 순이었다. 최근 3개월 평균 한달 동안 간호한 섬망 환자 수는 1~2명 51명(50.0%), 3~5명 19명(18.6%), 6~10명 15명(14.7%), 없음 9명(8.8%), 10명 초과 8명(7.8%) 순이었다. 섬망에 대한 교육경험 여부에 대하여는 있는 경우가 65명(63.7%)으로 없다고 대답한 응답자보다 많았다. 섬망 교육에 대한 필요성에 대한 답으로는 매우 그렇다 57명(55.9%), 그렇다 45명(44.1%)으로 나타났다(Table 1).

Table 1. General Characteristics of the Subjects (N=102)

Variable	Category	n (%)	Mean±SD
Age (year)	25~29	48 (47.1)	31.42±5.76
	30~39	44 (43.1)	
	≥40	10 (9.8)	
Sex	Male	7 (6.9)	
	Female	95 (93.1)	
Education level	College	11 (10.8)	
	University	84 (82.4)	
	≥Graduate school	7 (6.9)	
Married status	Single	64 (62.7)	
	Married	38 (37.3)	
Length of career (year)	<5	42 (41.2)	7.38±6.30
	5~9	34 (33.3)	
	≥10	26 (25.5)	
Number of caring experience with delirious patients for 1 month (average for the last 3 months)	None	9 (8.8)	
	1~2	51 (50.0)	
	3~5	19 (18.6)	
	6~10	15 (14.7)	
	>10	8 (7.8)	
Experience of education for delirium	Yes	65 (63.7)	
	No	37 (36.3)	
Necessity of education for delirium	Urgently needed	57 (55.9)	
	Needed	45 (44.1)	

SD=Standard deviation.

2. 연구대상자의 섬망 관련 지식, 섬망 간호 자신감, 섬망 간호 수행 정도

본 연구대상자의 섬망 관련 지식 정도는 47점 기준으로 34.19 ± 4.96 점이었다. 이를 구성하는 세부항목을 높은 순서대로 나열해보면, 증상에 대한 지식이 11점 만점에 9.12 ± 0.90 점으로 가장 높고 섬망의 사정에 대한 지식이 7점 만점에 5.20 ± 1.23 점, 위험요인에 대한 지식이 15점 만점에 10.95 ± 3.01 점, 중재지식이 14점 만점에 8.91 ± 1.81 점 순으로 나타났다.

섬망 간호 자신감 정도는 100점 만점 기준으로 61.60 ± 16.34 점이었고, 섬망 간호 수행 정도는 4점 만점 기준으로 2.89 ± 0.41 점이었었다. 섬망 간호 수행을 하부영역으로 나누어보면 위험요인 사정 수행이 3.02 ± 0.55 점, 간호중재 수행 영역이 2.85 ± 0.41 점이었었다(Table 2).

3. 연구대상자의 일반적 특성에 따른 섬망 간호 수행

연구대상자의 특성에 따른 섬망 간호 수행은 결혼상태($t = -2.96$, $p = .004$), 섬망 교육경험 여부($t = 3.59$, $p = .001$), 섬망 교육에 대한 필요성($t = 3.54$, $p = .001$)에 따라 통계적으로 유의한 차이가 나타났다. 대상자가 기혼인 경우 섬망 간호 수행 점수가 높았고 섬망 교육

Table 2. Nurse's Knowledge of Delirium, Confidence and Nursing Performance of Delirium Patients (N=102)

Variable	Category	Range	Min	Max	Mean±SD
Knowledge	Etiology	0~15	2	15	10.95±3.01
	Signs & symptoms	0~11	5	11	9.12±0.90
	Assessment	0~7	2	7	5.20±1.23
	Nursing interventions	0~14	4	13	8.91±1.81
	Total	0~47	17	45	34.19±4.96
Confidence	Total	0~100	20	100	61.60±16.34
Performance	Risk factors	1~4	1.4	4	3.02±0.55
	Nursing interventions	1~4	1.55	4	2.85±0.41
	Total	1~4	1.52	4	2.89±0.41

Max=Maximum; Min=Minimum; SD=Standard deviation.

을 받은 대상자가 교육경험이 없는 대상자보다 섬망 간호 수행도가 높게 나타났다. 섬망 교육에 대한 필요성을 묻는 질문에 '매우 그렇다'고 대답한 그룹이 '그렇다'고 대답한 그룹보다 섬망 간호 수행도가 높게 나타났다(Table 3).

4. 섬망 관련 지식, 섬망 간호 자신감, 섬망 간호 수행과의 상관관계

섬망 관련 지식은 섬망 간호 자신감($r=.25, p=.01$)과 양의 상관관계가 있었다. 섬망 간호 자신감은 섬망 간호 수행($r=.41, p<.001$)과 양의 상관관계가 있는 것으로 나타났다(Table 4).

5. 섬망 간호 수행에 미치는 영향

섬망 간호 수행에 영향을 미치는 요인을 파악하기 위하여 일반적 특성 중 섬망 간호 수행도와 유의한 차이가 나타났던 결혼상태, 섬망 교육경험, 섬망 교육 필요성과 상관분석에서 섬망 간호 수행과 유의한 상관관계가 있었던 섬망 간호 자신감, 그리고 본 연구에서는 유의한 상관관계에 있지 않았으나 선행연구에서는 유의한 상관관계에 있었던 섬망 관련 지식[17]을 독립변수로 하여 다중회귀분석을 실시하였다. 명목척도인 결혼상태, 섬망 교육경험, 섬망 교육 필요성은 가변수(dummy variable)로 변환하였다. 회귀 분석의 사용 적절성을 검토한 결과, Durbin-watson 지수는 1.699로 2보다 작아 자기상관이 없는 것으로 나타났고 다중공선성(variance Inflation Factor) 1.040~1.143으로 10 이상의 변수가 없으므로 독립변수 간의 다중공선성은 없는 것으로 나타나 기본 가정을 충족하였다.

다중회귀분석을 실시한 결과, 회귀모형은 적합한 것으로 나타났으며($F=8.46, p<.001$) 섬망 간호 수행에 영향을 미치는 변수는 섬망 간호 자신감($\beta=.32, p=.001$), 결혼상태($\beta=.21, p=.016$), 섬망 교육경험($\beta=-.19, p=.032$)의 순으로 유의하게 나타났다. 본 연구의 설명력은 27%였다(Table 5).

Table 3. Differences in Nursing Performance With Delirium Patients According to the General Characteristics (N=102)

Characteristic	Category	Nursing performance with delirium patients	
		Mean±SD	t or F (p)
Age (year)	<30	2.85±0.63	0.39 (.677)
	30~39	2.92±0.05	
	≥40	2.94±0.14	
Sex	Male	2.74±0.34	-0.99 (.324)
	Female	2.90±0.41	
Education level	College	2.67±0.53	1.76 (.176)
	University	2.91±0.38	
	≥Graduate school	2.92±0.52	
Married status	Single	2.80±0.38	-2.96 (.004)
	Married	3.04±0.42	
Length of career (year)	<5	2.83±0.43	0.63 (.534)
	5~9	2.92±0.36	
	≥10	2.93±0.43	
Number of caring experience with delirious patients for 1 month (average for the last 3 months)	None	2.87±0.32	0.84 (.503)
	1~2	2.84±0.44	
	3~5	2.97±0.40	
	6~10	2.84±0.29	
	>10	3.08±0.46	
Experience of education for delirium	Yes	2.99±0.40	3.59 (.001)
	No	2.70±0.35	
Necessity of education for delirium	Urgently needed	3.01±0.43	3.54 (.001)
	Needed	2.73±0.32	

SD=Standard deviation.

Table 4. Correlation Among Knowledge, Confidence, Nursing Performance of Delirium (N=102)

Variable	Knowledge	Confidence	Nursing performance
Knowledge	1		
Confidence	0.25 (.01)	1	
Nursing performance	0.05 (.56)	0.41 (<.001)	1

Values are presented as F (p).

Table 5. Multiple Regression Analysis of the Factors Affecting Nursing Performance for Patients With Delirium (N=102)

Variable	B	SE	β	t	p-value
(Constant)	2.86	0.33		8.59	<.001
Knowledge	-0.01	0.01	-.1	-1.22	.223
Confidence	0.01	0.00	.32	3.48	.001
Married status (ref.=single)	0.18	0.07	.21	2.44	.016
Experience of education for delirium (ref.=yes)	-0.17	0.07	-.19	-2.18	.032
Necessity of education for delirium (ref.=urgently needed)	-0.12	0.07	-.15	-1.64	.103
$R^2=.30$, adjusted $R^2=.27$ ($F=8.46$, $p<.001$)					

ref.=Reference; SE=Standard error.

논의

본 연구는 간호간병통합서비스병동 간호사의 섬망 관련 지식, 섬망 간호 자신감, 섬망 간호 수행 간의 관계를 파악하고 섬망 간호 수행에 영향을 주는 요인을 도출하여 섬망 교육에 대한 기초자료를 제공하기 위해 시도되었다.

본 연구에서 섬망 관련 지식점수의 평균은 47점 만점을 기준으로 34.19점이었다. 이는 동일한 도구로 상급종합병원의 암병동 간호사를 대상으로 연구한 Park과 Gu [22]의 연구에서 31.69점, 종합병원 간호사를 대상으로 연구한 Park과 Chang [19]의 연구에서 32.15점으로 나타난 연구보다 더 높았다. 종합병원 중환자실 간호사를 대상으로 한 Kim과 Song [14]의 연구에서는 본 연구와 같은 도구를 사용하였으나 100점으로 환산한 점수로 결과를 기술하여, 본 연구 결과를 100점으로 환산한 결과 72.74점으로 Kim과 Song [14]의 61.29점보다 높게 나타났다. 또한 다른 도구를 사용하여 직접적으로 비교하기는 어려우나 대학병원 일반병동 간호사를 대상으로 한 Park과 Song [12]의 섬망 관련 지식점수는 100점을 기준으로 환산한 68.31점, 종합병원 간호사를 대상으로 한 Kim과 Lee [20]의 61.82점, 종합병원 간호사를 대상으로 한 Kang과 Song [24]의 69.75점, 노인요양병원 간호사를 대상으로 한 Kim [17]의 64.66점으로 본 연구가 높게 나타났다. 본 연구에서 섬망 관련 지식점수가 높은 이유는 연구대상자의 섬망 관련 교육경험이 있다고 대답한 간호사의 비율이 63.7%로 선행연구[12,14,17,19,20,22,24]에서 교육경험이 있다고 대답한 비율(7.7%~50.7%)과 비교하여 높기 때문이라고 추론할 수 있는데 이것은 섬망 관련 지식 정도는 섬망에 대한 교육경험 유무와 유의한 관련이 있었던 선행연구[12,17]와 섬망 교육 이후 간호사들의 섬망 관련 지식점수가 유의하게 상승했던 Park과 Park [25]의 연구결과를 지지한다. 특히 본 연구에서 섬망 관련 지식의 하부요인에서 증상에 대한 지식이 가장 높았고 중재에 대한 지식이 가장 낮게 나타났는데, 이 결과는 같은 도구를 이용한 연구 [14,19]에서도 동일했다. 이것은 간호사들이 섬망 증상에 대한 높은 지식을 바탕으로 섬망 증상을 사정하더라도 중재에 대한 지식의 정도가 낮아 적절한 섬망 간호중재 제공에 어려움이 있을 수 있음을 의

미한다. 따라서 간호사를 대상으로 한 섬망 관련 교육 시 섬망 간호 중재에 관한 지식의 비중을 높여 시행할 필요가 있겠다.

본 연구에서 섬망 간호 자신감은 100점 만점에 평균 61.60점으로 확인되었다. 같은 도구를 사용하여 종합병원 간호사를 대상으로 연구한 Park과 Chang [19] 52점, Kim과 Lee [20] 58.89점, 종합병원 중환자실 간호사를 대상으로 한 Kim과 Song [14]의 51.78점보다 높았다. 국내외의 실험연구[18,23]에서 섬망 교육 시행 후 교육을 받은 간호사들이 대조군에 비해 섬망 간호 자신감이 유의하게 상승한 결과를 확인할 수 있었다. 본 연구의 대상자들은 앞서 언급했듯이 다른 연구[14,19,20]의 대상자들에 비해 비교적 섬망 교육경험 비율이 높기 때문에 섬망 간호 자신감 점수도 높게 나타난 것으로 사료된다.

본 연구에서 섬망 간호 수행은 4점 기준에 평균 2.89점으로 측정되었다. 같은 도구를 이용하여 상급종합병원의 암병동 간호사를 대상으로 연구한 Park과 Gu [22]의 2.40점보다 높았다. 이는 간호간병통합서비스병동에서 일하는 간호사가 보호자가 상주하는 일반병동 간호사보다 환자와 접촉빈도가 높으므로[15] 섬망 위험요인 사정 및 중재 제공이 높은 것으로 생각된다. 다른 도구를 사용한 연구결과와 비교해보면, 대학병원 일반병동 간호사를 대상으로 한 Park과 Song [12]의 74.8점, 종합병원 간호사를 대상으로 한 Kim과 Lee [20]의 연구에서 72.5점, Kang과 Song [24]의 연구에서 69.5점, Park과 Chang [19]의 연구에서 71.25점, 노인요양병원 간호사를 대상으로 한 Kim [17]의 연구에서 48.43점이었다. 본 연구결과를 100점을 기준으로 환산한 점수는 72.25점으로 도구가 달라 정확한 비교는 어려우나 대체로 대학병원과 종합병원에서 근무하는 간호사의 섬망 간호 수행도가 요양병원에서 근무하는 간호사보다 높았으며 이와 같은 결과는 대학병원과 종합병원, 요양병원의 환경적 차이가 있기 때문이라고 사료된다. 특히 요양병원 간호사는 1인당 돌보는 환자 수가 타 기관의 간호사보다 현저히 많으므로 요양병원 간호사의 낮은 섬망 간호 수행도는 간호사 1인당 돌보는 환자 수가 적을 때 높은 섬망 간호 수행률이 관찰되었다는 Suh와 Yoo [13]의 연구결과를 지지한다. 종합병원 중환자실 간호사를 대상으로 한 Kim과 Song [14]의 연구에서는 64.56점으로 본 연구에 비해 섬망 간호 수행도가 낮게 나타났다. 중환자실 간호사들은 환자의 예후에 미치는

섬망의 영향에 대한 인식이 낮다고 나타났으며[26] 돌보는 환자의 중증도가 높아 섬망 간호에 대한 우선순위가 상대적으로 낮아[27] 섬망 간호 수행점수가 낮게 나타날 수 있다.

섬망 간호 수행을 하위 영역으로 살펴보면, 본 연구에서는 섬망의 위험요인을 사정하는 영역의 평균이 3.02점으로 섬망의 간호중재에 대한 영역인 2.85점보다 높았다. 이는 대상자의 섬망 관련 지식 증상에 대한 지식이 가장 높고 중재에 대한 점수가 가장 낮았던 결과와 연관이 있을 것으로 생각된다. 또한 본 연구를 진행한 경기도 가톨릭대학교 의정부성모병원은 2023년부터 병동환자 입실 시 섬망 고위험군을 사정하여 고위험대상자에게 한국어판 간호 섬망 선별 도구(Korean Nursing Delirium Screening Scale)를 이용하여 입실한 날로부터 3일간 섬망 사정을 시행하는 프로세스가 도입되어 섬망 사정에 대한 간호 수행도가 높게 나타났을 수 있다. 따라서 섬망 간호 중재 수행도를 높이기 위한 방안으로는 섬망 간호 중재에 대한 교육을 통해 섬망 간호 중재에 대한 지식수준을 높이고[25] 섬망 관리 가이드라인의 도입을 통해 간호사들이 섬망 환자를 돌보며 받든 스트레스 정도를 감소시키고 섬망 간호 수행률을 유의하게 높인 선행연구[22,28]에 주목하여 병동 내 섬망 관리 가이드라인을 개발하고 이를 병동에 비치하는 방법이 있다. 섬망 관리 가이드라인 제작 시 간호간병통합서비스병동의 환경적 특성을 고려하는 것이 필요하다. 병동에 비치된 테블릿 PC를 이용하여 원격 방문을 시행하거나 평소 환자에게 친숙한 물건과 환자의 감각을 보조하는 안경, 보청기, 가족 사진 등을 입원준비물로 지정하여 집에서 가져오도록 하는 보호자 교육, 그리고 간단한 게임으로 구성된 인지 자극 활동 치료 키트의 대여 등의 간호 중재가[29] 섬망 간호 수행도를 높이는 데 도움이 될 수 있을 것이라고 사료된다. 측정도구가 달라 일관된 비교는 어려우나 하부요인 점수를 100점 기준으로 환산하여 비교해보면 Kang과 Song [24], Kim과 Song [14], Kim [17]의 연구결과는 섬망의 사정에 대한 영역(63.0%~71.5%)이 간호중재 영역(45.3%~66.7%)보다 최소 4.7점, 최대 17.7점 높은 것으로 본 연구와 결과가 같았으나 Park과 Chang [19], Kim과 Lee [20]의 연구에서는 간호중재 영역(71.25%~72.75%)이 사정의 영역(71.0%~71.5%)보다 근소하게 더 높아 결과가 반대로 나타났다. Kim과 Lee [20]의 연구에서는 임상경력 1년 이상 된 간호사를 대상으로 진행했고 본 연구와 Kang과 Song [24], Kim과 Song [14]의 연구에서는 임상경력이 6개월 이상 되는 간호사를, 그리고 Kim [17], Park과 Chang [19]의 연구에서는 임상경력 제한이 없었다. Park과 Chang [19], Kim과 Lee [20]의 연구에서는 임상경력이 10년 이상 된 간호사의 비율이 30.0%~38.3%로 최소 30%가 넘었으나 본 연구와 Kang과 Song [24], Kim과 Song [14], Kim [17]의 연구에서는 임상경력이 10년 이상 된 간호사의 비율이 17.1%~27.1%로 낮았다. 이는 임상경력이 높을수록 섬망 간호 수행도가 높았던 연구결과[17,19] 및 근무경력이 1개월 증가할수록 노인환자의 섬망에 대한 주관적인 평가와 연구

자의 선별도구를 이용한 섬망평가간의 불일치율이 0.95배 감소하였다는 선행연구[16]를 지지한다. 임상경력 1년 이상의 간호사 집단이나 임상경력이 10년 이상인 간호사의 비율이 30%가 넘는 비교적 숙련된 간호사 집단은 섬망 간호의 중재 수행도가 높아져 비교적 상향 평준화가 이루어지게 되고 근소한 차이지만 사정영역보다 높게 측정됨을 알 수 있다.

본 연구에서 대상자의 일반적 특성에 따른 섬망 간호 수행은 결혼 상태, 섬망 교육경험 여부, 섬망 교육에 대한 필요성에 따라 통계적으로 유의한 차이가 있었다. 간호간병통합서비스병동 간호사 단일집단을 대상으로 한 선행연구는 없었기 때문에 종합병원 간호사를 대상으로 한 연구결과를 위주로 살펴보면, 기혼인 대상자가 미혼인 대상자보다 섬망 간호 수행도가 높았는데 이것은 Kang과 Song [24], Kim과 Lee [20]의 연구결과와 일치할 뿐만 아니라 노인요양병원 간호사를 대상으로 한 Kim [17]의 연구와도 결과가 같았다. 결혼상태에서 기혼인 간호사는 미혼상태인 간호사보다 임상경력 및 연령이 높을 가능성이 있으며 임상경력이 많을수록[17,20], 연령이 높을수록[20] 섬망 간호 수행도가 높아진다는 연구결과와 관련이 있다. 또한 기혼 간호사는 결혼으로 인해 가족구성원이 늘어나고 가정간호경험의 빈도가 잦아지게 되어 고령의 가족구성원을 대해본 경험의 증가로 인해 자연스럽게 노인 섬망 간호 수행도가 높아졌을 수 있다.

본 연구에서 섬망 교육을 받았던 경험이 있는 대상자가 없는 대상자에 비해 섬망 간호 수행도가 높게 나타난 것은 Kang과 Song [24], Kim과 Lee [20]의 연구결과와 일치했다. 또한 간호사에게 섬망 교육 프로그램을 제공하고 난 후 실험군에서 대조군에 비해 섬망 간호 수행도가 유의하게 높아진 간호간병통합서비스병동 간호사를 대상으로 한 Kim과 Kim [28], 종합병원의 일반병동 간호사를 대상으로 한 Kim과 Lee [23], 중환자실 간호사를 대상으로 한 Park과 Park [25]의 실험 연구결과도 간호사의 섬망 교육경험이 섬망 간호 수행을 증가시켰으므로 본 연구결과를 지지한다. 반면 종합병원 중환자실 간호사를 대상으로 한 Kim과 Song [14], 종합병원 간호사를 대상으로 연구한 Park과 Chang [19]의 연구에서는 간호사의 섬망 교육 유무에 따라 통계적으로 유의한 차이가 없었는데, 이것은 대상자가 섬망 간호교육을 받은 경로, 교육 방식, 교육을 받은 시기에 따라 결과가 달라질 수 있으므로 추가 연구가 필요하다.

섬망 교육에 대한 필요성을 강하게 느낄수록 섬망 간호 수행도가 높았던 본 연구의 결과는 종합병원 간호사를 대상으로 한 Park과 Chang [19]의 연구결과와 같았으나 대학병원의 일반병동 간호사를 대상으로 한 Park과 Song [12]의 연구결과에서는 유의한 차이가 없었다. 이는 섬망 교육의 필요성을 느낄수록 스스로 동기부여가 되어 관련 정보를 습득하였을 것으로 생각하며 현재까지 일반적 특성에 해당 변수가 포함된 연구가 부족한 상황이므로 반복연구가 필요하다. 선행연구에서는 유의한 차이가 있었던 최근 간호한 섬망 환자의 수[19], 연령[20], 최종학력[20], 임상경력[20]은 본 연구결

과에서 유의한 차이가 없었는데, 추후 반복연구가 필요하다고 생각한다.

섬망 관련 지식, 섬망 간호 자신감, 섬망 간호 수행과의 관계를 살펴보면 섬망 간호 자신감과 섬망 간호 수행, 섬망 관련 지식과 섬망 간호 자신감은 양의 상관관계가 나타나 Park과 Chang [19], Kim과 Lee [20], Kim과 Song [14]의 연구결과와 일치했다. 그러나 선행연구들[14,19,20]과 달리 본 연구에서는 섬망 간호 수행과 섬망 관련 지식 사이에 통계적으로 유의한 상관관계가 없었으며 이것은 Cho [21]의 연구결과를 지지한다. 이미 간호사가 알고 있더라도 이것이 수행으로 이어질 때 여러가지 장애요인들이 관여하며[26] 특히 COVID-19 팬데믹의 특수한 상황과 관련이 있을 수 있다[29]. 감염관리를 위한 의료진의 보호구 착용 및 병실 출입 제한은 일반적인 섬망 간호중재와 거리가 멀지만 감염병의 예방 및 관리, 간호간병통합서비스병동의 운영방침을 지키기 위해 적절한 섬망 간호 수행이 어려웠다고 볼 수 있다. 따라서 추후 섬망 간호 수행의 장애요인에 대한 연구가 필요하다고 생각된다.

간호간병통합서비스병동 간호사의 섬망 간호 수행에 영향을 미치는 요인으로는 섬망 간호 자신감, 결혼상태, 섬망 교육경험의 순서로 나타났으며 전체 설명력은 27%였다. 본 연구에서 섬망 간호 자신감은 섬망 간호 수행에 가장 강력한 영향을 미쳤는데 이 결과는 Kim과 Lee [20], Kim과 Song [14], Park과 Chang [19]의 연구에서도 공통적으로 가장 큰 영향을 주는 요인으로 나타났다. 본 연구에서 섬망 관련 지식이 증가함에 따라 섬망 간호 자신감에 긍정적인 영향을 미치는 것을 확인하였으며 이 결과는 선행연구[14,19,20]와 일치하며 섬망 관련 지식이 섬망 간호 자신감을 강화시키는 경향을 보여준다. 간호사에게 교육을 제공하여 섬망 관련 지식수준을 높이는 것이 간호사로 하여금 섬망 환자의 식별과 관리 대한 자신감을 높일 수 있으며[30] 실제로 간호사를 대상으로 섬망 교육 프로그램을 시행하고 난 후 대조군에 비해 실험군의 자신감이 증가한 실험연구 결과가 국내외의 연구에서 도출되었다[18,23]. 이때 시행된 섬망 교육 프로그램은 섬망 간호 교육 책임자가 현장에서 일반 간호사들에게 교육하는 과정을 포함하고 있었는데 이는 단순히 이론교육에만 그치지 않고 실무에서의 적용까지 돕는 훈련 과정이 간호사의 섬망 간호 자신감을 효과적으로 상승시켰다고 생각된다. 따라서 간호사는 체계적인 섬망 교육 프로그램과 함께 임상 현장에서 섬망 사정 도구의 도입, 섬망 관리 가이드라인의 섬망 간호 중재 수행을 통해 교육받은 내용을 실제 임상현장에서 적용해 보는 경험을 축적하며 섬망 간호 자신감을 높일 수 있다. 이러한 경험적 습득이 중요하므로 간호간병통합서비스병동 특성에 맞는 표준화된 섬망 간호 가이드라인 개발이 필요하며 이를 통해 섬망 간호 수행의 향상을 도모할 수 있을 것이다.

본 연구에서 결혼상태는 두 번째로 섬망 간호 수행에 영향을 미치는 변수로 확인되었다. Kang과 Song [24], Kim과 Lee [20]의 연구

에서는 결혼상태와 섬망 간호 수행에 유의한 차이는 있었으나 섬망 간호 수행에 영향을 미치는 변수로는 나타나지 않았다. 이러한 결과는 본 연구에서 기혼인 대상자는 38명이나 Kang과 Song [24]의 연구에서 기혼인 대상자는 64명, Kim과 Lee [20]의 연구에서는 79명으로 본 대상자 수의 2배 이상으로 대상자 수로 인한 차이로 생각한다. 따라서 추후 대상자수를 확대하여 결혼상태에 따라 섬망 간호 수행에 영향을 미치는지 확인할 필요가 있다.

본 연구에서 섬망 교육경험은 섬망 간호 수행에 세 번째로 영향을 미치는 요인으로 나타났으며 Kang과 Song [24], Kim과 Lee [20]의 연구결과에서도 섬망 간호 수행에 영향을 미치는 요인으로 섬망 간호교육경험이 확인되어 본 연구결과를 지지했다. Park과 Song [12]과 Kim [17]의 연구에서 섬망 간호교육을 받은 간호사는 그렇지 않은 간호사에 비해 섬망 관련 지식수준이 유의하게 높았다. 간호사가 섬망 고위험환자 및 섬망 환자에게 적절한 간호중재를 제공하기 위해서는 정확한 섬망 관련 지식이 그 바탕이 되어 이루어진다. 섬망 간호교육은 간호사의 섬망 관련 지식수준을 향상시킬 뿐만 아니라 섬망 간호 자신감도 향상시켜 섬망 간호 수행도를 높이므로 수준 높은 섬망 간호 제공을 위해서는 간호사의 교육경험이 첫 번째 단추가 된다. 본 연구결과 간호간병통합서비스병동에서 근무하는 간호사의 91.2%가 한달 평균 최소 1명 이상 섬망 환자를 돌보고 있었으나 섬망 간호교육경험이 전혀 없는 36.3%의 간호사도 임상현장에서 섬망 간호중재를 제공하고 있었으며 선행연구[12,14,17,19,20,22,24]에서는 교육경험이 없는 간호사비율이 49.3%~92.3%에 달했다. 간호사의 주된 섬망 교육 경로는 정규 교육이 아니라 임상현장에서의 경험적 습득이므로[20] 임상현장에서 교육을 통한 지식습득 기회를 제공하는 것이 시급하다고 사료된다.

본 연구의 제한점은 의정부시에 위치한 가톨릭대학교 의정부성모병원의 간호간병통합서비스병동 간호사를 대상으로 국한하여 편의 표집했기 때문에 전체 간호간병통합서비스병동 간호사로 일반화할 수 없고 대상자의 섬망 간호 수행도를 객관적으로 평가하지 않고 자기기입식 설문지로 평가하였던 제한점이 있어 본 연구 결과를 일반화하는 데 신중을 기해야 한다. 그러나 간호간병통합서비스병동 간호사들의 섬망 관련 지식과 섬망 간호 자신감 정도를 파악하고 섬망 간호 수행에 미치는 영향을 확인한 것에 의의가 있다.

결론 및 제언

본 연구는 대학병원 간호간병통합서비스병동 간호사의 섬망 관련 지식, 섬망 간호 자신감, 섬망 간호 수행 정도를 확인하고 섬망 간호 수행에 영향을 미치는 요인을 규명하여 섬망 교육 프로그램 계획 시 기초자료를 제공하기 위해 시도되었으며 본 연구의 설명력은 27%로 나타났다. 간호간병통합서비스병동 간호사의 섬망 간호 수행에 영향을 미치는 요인으로는 섬망 간호 자신감, 결혼상태, 섬망 교육경

험의 순으로 나타났으며 따라서 섬망 간호 자신감과 섬망 교육경험을 높여 효과적인 섬망 간호 수행 향상을 달성하기 위한 전략이 필요하다.

연구결과를 토대로 다음과 같이 제언하고자 한다. 첫째, 본 연구는 일개 대학병원의 간호간병통합서비스병동 간호사를 대상으로 시행한 연구로 일반화가 어려우므로, 추후 표본의 수를 늘려 섬망 간호 수행도에 미치는 영향의 규명을 위한 반복연구를 제언한다. 둘째, 간호간병통합서비스병동 특성을 반영한 표준화된 섬망 교육 프로그램 및 섬망 간호 가이드라인의 개발과 적용을 제언한다. 셋째, 표준화된 섬망관련 간호지식 측정도구 및 섬망 간호 수행 측정도구의 개발을 제언하며 이를 통해 섬망 교육 프로그램의 효과를 객관적으로 비교, 검증하는 연구가 필요하다.

ORCID

Ho Yeong Kim, <https://orcid.org/0009-0008-6448-6392>

Su Ol Kim, <https://orcid.org/0000-0003-0231-812X>

Authors' contribution

Study conception and design acquisition - HYK and SOK; Data Collection - HYK and SOK; Analysis and interpretation of the data - HYK and SOK; Drafting and critical revision of the manuscript - HYK and SOK

Conflict of interest

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

Funding

None.

Data availability

Please contact the corresponding author for data availability.

Acknowledgements

None.

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장기요양시설 간호종사자의 완화·생애말기 돌봄 준비도 측정도구의 한국어판 타당도와 신뢰도: 방법론적 연구

장수정¹, 문성미², 이나경³

¹강릉원주대학교 간호학과 부교수, ²울산대학교 의과대학 간호학과 교수, ³청암대학교 간호학과 조교수

Validity and reliability of Korean version of the nursing staff preparedness for palliative and end-of-life care in long-term care homes: A methodological study

Soo Jung Chang¹, Seongmi Moon², Na Kyoung Lee³

¹Associate Professor, Department of Nursing, Gangneung-Wonju National University, Wonju, Korea

²Professor, Department of Nursing, College of Medicine, University of Ulsan, Ulsan, Korea

³Assistant Professor, Department of Nursing, Cheongam College, Suncheon, Korea

Received: October 30, 2023

Revised: January 10, 2024

Accepted: February 12, 2024

Corresponding author:

Na Kyoung Lee

Department of Nursing, Cheongam

College, 1641 Noksaek-ro,

Suncheon 57997, Korea

TEL: +82-61-740-7214

E-mail: dhlqndls0@naver.com

Purpose: Globally, the issue of palliative and end-of-life care (PEOLC) in nursing homes is a common concern, and the need to measure the preparedness of nursing staff for end-of-life care is increasing. This study aimed to verify the validity and reliability of the Korean version of the self-reported scale for the Staff Preparedness for PEOLC in long-term care homes. **Methods:** A total of 161 staff took part in the study; among them were nine nurses, 19 nursing assistants, 133 care workers at four nursing homes located in Wonju and Seongnam cities, South Korea. The scale was translated according to the guidelines of World Health Organization guidelines and Consensus-Based Standards for the Selection of Health Measurement Instruments, and its reliability and validity were evaluated through assessing its internal consistency, stability, and construct validity (confirmatory factor analysis, CFA). **Results:** CFA confirmed that the measurement tool had a good fit (comparative fit index=.96, Tucker-Lewis index=.95, root mean-squared error of approximation=.07). The items' internal consistencies of the items were found to be reliable with Cronbach's alpha=.94; the Pearson's correlation coefficient between test and retest of the tool was .86 ($p<.001$); and the intraclass correlation coefficient value was .91 (95% confidence interval: .85~.96). **Conclusion:** The Korean version of the Staff Preparedness for PEOLC in long-term care homes was confirmed to be a useful and reliable scale for measuring the preparedness of nursing staff in Korean long-term care facilities in Korea for PEOLC.

Keywords: Factor analysis, statistical; Long-term care; Nursing staff; Palliative care; Reproducibility of results

서론

우리나라는 전 세계에서 유례없이 고령화 속도가 매우 빠르게 진

행되고 있고, 노인 중에서도 특히, 기능 상태가 급격히 떨어져 요양이 필요한 85세 이상의 노인이 2020년 77만 2천여 명에서 2030년 144만 4천여 명으로 약 2배가량 증가할 것으로 예상된다[1]. 이러한

고령화 추세는 장기요양시설 수와 이용자 수 증가에도 영향을 주어 2008년 1,754개소, 64,181명에서 2022년 6,069개소, 185,128명으로 빠르게 증가하였다[2]. 장기요양시설 노인의 특성을 살펴보면, 2019년 기준 80대와 90대가 68%였고, 평균 3.4개의 만성 복합질환이 있었으며, 거동이 불가능한 노인의 비중이 노인요양시설과 노인요양공동생활가정에서 각각 25.1%, 21.7%였다. 특히, 노인 사망원인 중 5위로 알려진 치매를 가진 노인의 비율이 83%를 넘는 것으로 나타났다[3]. 이는 장기요양시설 노인의 대부분이 인지기능과 신체기능이 쇠퇴한 고령의 노인들로서, 안정화될 가능성이 없고 회복될 수 없어서 결국 사망하게 되는 생애말기(end-of-life) [4] 과정에 있음을 시사해준다.

이 시기에는 대상자와 가족에 대해 증상을 관리하고 임박한 죽음에 대처하며, 신체적, 정서적, 영적 요구가 충족될 수 있도록 다양한 의료적·사회적 돌봄이 필요하다[4]. 이는 곧 생애말기 돌봄(end-of-life care)과 완화 돌봄(palliative care)이라는 개념으로 설명될 수 있다. 생애말기 돌봄은 생의 마지막 몇 달 혹은 몇 년의 시기에 있는 사람들이 사망할 때까지 가능한 한 잘 살고 존엄하게 죽을 수 있도록 도와주는 돌봄이다[5]. 완화 돌봄은 생명에 위협이 되는 질환 문제에 직면한 대상자와 가족의 신체, 심리·사회적, 영적 문제와 고통을 예방·경감하는 돌봄으로서 불필요한 병원 입원과 건강서비스 사용 감소 효과를 넘어 건강에 대한 '인권'으로 명시되고 있다[6]. 또한, 완화 돌봄은 '인간의 요구'에 초점을 두어, 의료인뿐만 아니라 다양한 비전문가들에 의해서도 제공될 수 있다[7]. 그 예로, 장기요양시설 종사자들이 생애말기 노인의 신체적, 심리·정서적, 영적 요구를 파악하고 일상생활을 세심하게 보조하며, 노인의 가족과 소통하고 지지하는 돌봄을 들 수 있다[7].

생애말기 노인과 가족에 대한 돌봄이 효과적으로 수행되려면, 장기요양시설 종사자들이 생애말기 돌봄과 완화 돌봄에 대한 지식과 기술을 습득하고, 임종과 죽음에 대한 개방적 태도를 갖추기 위한 교육이 필요하다. 그러나 국내 간호종사자 대상 완화·생애말기 돌봄 교육 현황을 보면, 간호사의 경우 학부에서 말기환자 간호 교과목 이수 비율이 5.1%에 불과하고[8], 요양보호사의 경우 교육훈련이 신체 돌봄 중심으로 되어 있으며, 죽음 상황에 대한 대처 기술 교육은 이론 교육 3시간에 불과하다[9]. 이로 인해 갑작스러운 노인의 죽음에 직면했을 때, 준비가 미비한 간호종사자들이 겪는 스트레스와 부담감이 상당하며[10], 안정되고 질 높은 돌봄을 제공하기에 많은 어려움이 따르는 것[9]으로 알려져 왔다. 유럽과 북미 중심의 체계적 고찰 연구들[11,12]에서도 간호종사자의 생애말기 돌봄 준비도가 불충분한 것이 문제로 지적되면서 이를 해결하기 위한 방안으로 종사자 교육을 강조하고 있다. 그러나 국내에서는 장기요양시설의 상황과 종사자의 인구·사회학적 배경 등을 충분히 고려한 종사자 교육에 앞서 돌봄 준비도 수준을 측정하는 도구조차 개발되지 않은 상태다. 이에

선행연구들이 급성기 병원의 의료인(의사, 간호사 등)을 위해 개발된 도구를 요양보호사들에게 사용함으로써[8,9], 장기요양시설 종사자 대상 교육 돌봄 준비도를 정확하게 파악하기 어려운 한계가 있었다.

국외에서는 장기요양시설 종사자의 완화·생애말기 돌봄 준비도(staff preparedness for palliative and end-of-life care [PEOLC] in long-term care homes scale) [13]나 요구도(the palliative approach for nursing assistants [PANA] questionnaires) [14], 돌봄 역량 측정 도구(a nursing competence for end-of-life care scale in nursing homes) [15], 말기 치매 대상자를 위한 완화 돌봄 측정 도구(questionnaire on palliative care for advanced dementia, qPAD) [16], 완화 돌봄 측정 도구(palliative care survey, PCS) [17] 등 다양한 도구들이 개발되어 완화·생애말기 돌봄 교육 구성과 평가 등에 활용되고 있다. 이 도구들 중 PANA 설문지[14]는 nursing assistants를 위해 호주에서 개발된 40개 문항의 도구이고, Ohmura와 Yamashita [15]의 돌봄 역량 측정 도구는 간호사를 대상으로 개발된 21개 문항의 도구로, 장기요양시설 간호종사자 모두를 포괄하여 측정하지 못하는 제한점이 있다. qPAD [16]은 말기 치매 대상자의 완화 돌봄만을 측정할 수 있게 개발되었고, PCS [17]은 완화 돌봄 실무와 지식을 비교적 많은 수의 문항(51문항)으로 평가하게 되어 있다.

반면, 홍콩의 Chan 등[13]의 도구는 장기요양시설 종사자들의 완화·생애말기 돌봄 준비도를 평가할 목적으로 개발된 16개 문항의 도구다. 돌봄 준비도는 돌봄 제공에 필요한 지식, 기술, 심리적 준비와 스트레스 상황 대처 능력[13]을 나타내는 것으로, Chan 등[13]의 도구에서는 이 개념적 속성들을 '의지(willingness)', '역량(capability)', '회복력(resilience)'의 세 개 요인으로 측정하게끔 되어 있다. 원 도구의 개발 배경이 우리나라와 문화적으로 유사하고, 장기요양시설의 종사자들을 모두 포함하여 측정 가능하며, 응답에 들이는 시간과 에너지가 크지 않아 향후 장기요양시설 종사자의 완화·생애말기 돌봄 교육 프로그램 구성과 효과 평가 등에 쉽게 활용될 수 있을 것으로 기대된다. 따라서 본 연구에서는 Chan 등[13]의 장기요양시설 종사자의 완화·생애말기 돌봄 준비도 측정 도구를 한국어로 변환한 후, 구성타당도, 집단 비교 타당도, 내적 일관성 신뢰도, 안정성 신뢰도를 검증하는 것을 목적으로 하였다.

연구방법

Ethic statement: This study was approved by the Institutional Review Board (IRB) of Gangneung-Wonju National University (IRB No. GWNUIRB-2023-14-1). Informed consents were obtained from all participants.

1. 연구 설계

본 연구는 홍콩의 Chan 등[13]이 개발한 장기요양시설 간호종사자의 완화·생애말기돌봄 준비도 측정 도구를 한국어로 번안하고, 타당도와 신뢰도를 검증하는 방법론적 연구이다. 이 연구는 Consensus-based standards for the selection of health measurement instruments (COSMIN)의 보고 지침(<https://www.cosmin.nl/tools/checklists-assessing-methodological-study-qualities/>) [18]에 따라 기술하였다.

2. 연구 대상

원 도구[13]가 장기요양시설 간호종사자에게 적용하기 위해 개발된 점을 참고하여, 본 연구의 조사 대상을 선정하였다. 구체적인 선정 기준은 첫째, 장기요양시설(노인요양시설 또는 노인요양공동생활가정)에 소속되어 입소 노인을 직·간접적으로 간호 또는 돌봄에 관여하는 간호사, 간호조무사, 요양보호사, 둘째, 만 19세 이상의 성인으로 본 연구의 목적을 이해하고 동의한 자이다. 제의 기준으로는 장기요양시설에 소속된 간호사, 간호조무사, 요양보호사 중 임시직으로 근무하는 자로 하였다.

도구의 구성타당도 분석을 위해 필요한 대상자 수는 COSMIN 지침[18]에 제시된 기준인 문항별 7배와 100명 이상을 동시에 충족하고, 확인적 요인분석을 하기에 적합하다고 알려진 최소 표본 수 기준(150명) [19]을 충족해야 한다. 본 연구에서 설문지 167부가 배포·회수되었고, 무응답으로 확인된 6부를 제외한 총 161부(96.4%)가 자료 분석에 사용되었다. 이 수는 원 도구의 16개 문항의 7배에 해당하는 대상자 수 112명과 확인적 요인분석의 권장 최소 표본 수인 150명을 상회하였으므로 구성타당도 분석 기준을 충족한다. 또한, 도구의 안정성 검사(test-retest)를 위해 첫 설문에 참여한 대상자들 중 재검사 참여에 동의한 25명을 대상으로 첫 설문 후 3주 후에 동일한 설문을 반복 실시하였다.

3. 연구 도구

장기요양시설 간호종사자의 완화·생애말기 돌봄 준비도 측정도구(staff preparedness for PEOLC in long-term care homes scale) [13]를 분석에 사용하였다. Chan 등[13]은 장기요양시설 노인 대상의 완화 돌봄과 생애말기 돌봄 관련 문헌과 지침을 통합 분석하여 지식, 기술, 태도 요소를 포함하는 16개 문항을 개발하고, 노인 분야 다학제 전문가 패널에 의한 내용타당도를 거쳐 구성타당도, 집단 비교 타당도, 내적 일관성 신뢰도, 안정성 신뢰도를 검증하였다. 도구의 16개 문항은 세 개 요인으로 구성되어 있다. 첫 번째 요인인 '의지' 영역은 생애말기 노인을 돌보는 것의 수용과 자신감과 관련된 5개 문

항(1~5번)이다. 두 번째 요인인 '역량' 영역은 간호종사자가 완화·생애말기 돌봄을 제공하는 데 필요한 지식과 기술과 관련된 8개 문항(6~13번)이다. 세 번째 요인인 '회복력' 영역은 생애말기 노인과 사별 가족을 대할 때 경험하는 잠재적 스트레스와 정서적 소모 상황에 대처하는 능력을 평가하는 3개 문항(14~16번)으로 구성되어 있다. 각 문항은 자기기입식의 5점 리커트 척도로, '매우 동의하지 않음' 1점, '매우 동의함' 5점이며, 평균 점수가 높을수록 완화·생애말기 돌봄 준비도가 높음을 나타낸다. 도구 개발 당시 신뢰도 Cronbach's α 는 .93이었고, 하위 영역별로는 '의지' .81, '역량' .94, '회복력' .75였다.

4. 연구 절차

1) 도구 번역 및 내용타당도 검증

도구 개발자인 Chan과 e-mail 교신을 통해 도구의 한국어 번역 및 타당화를 위한 사용 승인을 받았다(personal communication; March 29, 2023). 도구 번역을 위해 세계보건기구(World Health Organization, WHO) [20]와 COSMIN [18]의 '언어가 다른 측정 도구'의 번역 방법과 지침에 따라 다음과 같이 연구를 진행하였다.

첫째, 연구팀 중 해당 도구의 용어에 익숙하고 영어문화권에 대한 기본 지식이 있으며 한국어를 모국어로 하는 1인과 영어를 잘 구사하고 홍콩에 거주하여 홍콩 문화에 대한 기본 지식은 있으나 본 도구의 구성적 요소에 익숙하지 않은 간호학 전공자 1인이 이 도구의 영문 설문지를 각자 한국어로 번역(forward translation)하였다. 이를 연구팀의 협의를 거쳐 적절한 표현으로 통합하였다.

둘째, 한국어와 영어에 익숙한 전문가 9인에게 번역된 설문지의 내용 관련성과 범위성 및 어의 동등성을 중심으로 내용타당도 평가를 받았다(expert panel). 전문가들은 노인과 장기요양시설 분야 전문가인 간호학 교수 2인, 신경과 전문의 1인 및 사회복지학 교수 1인, 생애말기 돌봄 분야 전문가인 간호학 교수 2인과 성직자 1인, 측정도구 분야 전문가인 간호학 교수 2인으로 구성되었다. 문항의 내용타당도 지수(content validity index, CVI) 기준은 전문가 집단 9인에서 문항별 CVI (item level CVI, I-CVI) .78 이상, 평균 I-CVI (scale-CVI, S-CVI, averaging method) .90 이상이면 '우수하다(excellent)'고 판단한다[21]. 본 도구의 I-CVI는 .89부터 1.00까지였으며, S-CVI (averaging method)는 .91로 산출되어, 문항들의 내용타당도가 우수한 것으로 확인되었다. 추가적으로, 좀 더 자연스러운 언어 표현과 간결하고 쉬운 용어 사용에 관한 전문가 의견들을 반영하여 문항들의 표현 일부를 수정하였다. 즉, '입소자'를 '대상자'로, '의향이 있다'를 '마음이 있다'로, '회복력이 있다'를 '몸과 마음을 추스르고 일상생활로 복귀할 수 있는 힘이 있다'로, '~한다고 생각한다'는 '~한다'로 수정하였다. 또한 전문가의 의견을 반영하여 설문지의 서두에 완화 돌봄과 생애말기 돌봄 개념에 대한 설명을 추가하였다.

셋째, 내용타당도를 거쳐 수정된 설문지를 원 도구 내용을 알지 못하는 재미 한인 간호사 1인과 전문 번역업체(<https://www.editage.co.kr/>) 소속 번역가 1인이 각자 영어로 역번역하였다(blind back-translation). 이를 연구팀의 협의를 거쳐 적절한 표현으로 통합하였다.

넷째, 역 번역된 설문지를 원 도구 개발자인 Chan에게 보내 원래의 도구와 비교 시 의미의 변화가 없어 수용 가능한지 확인하였다(comparison) (personal communication; June 4, 2023). 이 과정에서 1번 문항 'I am willing to provide personal care to terminally ill residents'에서 'personal care'의 의미가 개인위생에만 국한되지 않고, 개인적인 접촉이 필요한 일상생활의 도움을 의미한다는 것을 확인받았다. 또한 응답자들의 혼동을 줄이기 위해 'personal care'를 '일상생활(예: 개인위생, 식사, 배설 등) 돌봄'으로 구체화한 문장을 사용해도 무방하다는 확인을 받았다.

다섯째, 안면타당도(face validity) 확보를 위해 장기요양시설에 근무 중이거나 근무 경험이 있는 간호종사자(간호사 1인, 간호조무사 5인, 요양보호사 4인) 10인에게 4점 척도를 이용하여 문항 내용과 형태의 적절성, 포괄성, 이해의 용이성을 확인하였다. I-CVI는 .60부터 1.00까지였으며, S-CVI는 적절성 .89, 포괄성 1.00, 이해의 용이성 .79로 산출되었다. 또한 설문에 평균 11.8분이 소요되었다. 개별 면담(cognitive interview)을 통해 적절성과 이해의 용이성 측면에서 상대적으로 낮은 동의를 보인 문항(11번, 13번)에 대한 사유를 확인한 결과, "요양시설 노인들이 의사소통 자체가 안 되는 경우가 많아 영적 요구를 파악하기 어렵다", "가족의 범위가 애매하다", "노인과 가족의 관계가 나쁜 경우가 많아 가족과 소통하기 어렵다"는 의견이 있었다. 이는 소수 의견임을 감안하여 본 연구팀은 해당 문항들을 삭제나 변형하지 않고 일단 유지하기로 하였다.

2) 자료 수집

원주시와 성남시 소재 장기요양시설 시설장(또는 관리자)들에게 전화나 이메일로 연락하여 본 연구의 목적, 방법, 내용을 설명하고 협조를 구하였다. 이후, 자료수집 허락을 받은 시설 4곳을 방문하여 모집 공고문을 1주일간 게시 후 연구대상자를 모집하였다. 자발적으로 참여할 의사를 보이고 대상자 선정기준에 부합하는 간호종사자(간호사, 간호조무사, 요양보호사)들에게 책임연구자가 연구 설명문과 동의서 내용을 설명하고 서면 동의서를 받은 후, 설문지를 배포하였다. 이때, 첫 번째 참여 기관 참여자들의 경우, 도구의 안정성 검정을 위한 재검사에 대한 동의 설명도 같이 진행하였다. 설문지를 이용한 안정성 신뢰도 측정 시 1차 검사와 재검사 사이에 2~4주 정도의 간격이 권장됨에 따라[22], 재검사 참여에 동의한 25명에게 3주 후 해당 기관을 방문하여 1차 설문과 동일한 방식으로 설문을 실시하였다. 1차 검사와 재검사 모두 대상자가 외부 요인에 방해받지 않고 편안한 환경에서 설문지에 무기명으로 개별 기입하고, 동봉한 봉투에 밀봉한 후 시설 내 별도 공간의 회수함에 넣도록 안내하였다. 자료수

집 기간은 2023년 7월 4일부터 8월 24일까지였다.

5. 자료 분석 방법

수집된 자료는 SPSS/WIN 28.0 프로그램(IBM Corp.)과 AMOS 22.0 프로그램(IBM Corp.)을 사용하여 분석하였다. 대상자의 일반적 특성은 기술통계로 분석하였다. 구성타당도 검증 시, 항목의 세트가 어떠한 차원(dimensionality)을 가지는지 분석하기 위해서는 탐색적 요인분석을 사용하나 각 항목의 요인 구조가 확정된 도구에서 문화적 차이나 인구집단의 변화에도 여전히 타당한지 확인하기 위해서는 확인적 요인분석이 더 적절하다[23]. 따라서 본 연구에서는 장기요양시설 간호종사자의 완화·생애말기 돌봄 준비도 측정 도구의 구성 요인이 이미 선행 연구[13]에서 3개로 확인된 바 있으므로, 구성타당도 검정을 위해 확인적 요인분석을 실시하였다. 최종 모형의 확인적 요인분석의 타당성 평가를 위해 집중타당도(convergent validity)와 판별타당도(discriminant validity)를 검증하였다. 집중타당도는 개념신뢰도(construct reliability, CR) 값을 이용하였고, 판별타당도는 평균분산추출(average variance extracted, AVE)값을 이용하였다. 원 도구에서 간호사와 같은 전문가 집단과 돌봄 보조 인력(care assistants)의 평균 점수의 차이를 통해 집단 비교 타당도(known group validity)를 확인한 것[13]을 토대로, 본 연구에서도 간호사-간호조무사-요양보호사의 집단 비교 타당도 검정을 위해 자료의 정규성 확인 후 one-way analysis of variance (ANOVA)를 이용하였고, 사후 검정은 Scheffé test로 분석하였다. 또한 완화·생애말기 돌봄 교육이 간호학생이나 장기요양시설 간호종사자의 돌봄 준비도를 향상시킨 것을 근거로[12,24], 연구 참여자들의 완화·생애말기 돌봄 교육 이수 경험 유무에 따른 돌봄 준비도의 차이 분석(t-test)을 통해 집단 비교 타당도를 확인하였다. 도구의 내적 일관성 신뢰도 검정을 위해 Cronbach's α 를 이용하였고, 도구의 안정성 신뢰도(test-retest) 검정을 위해 피어슨 상관계수(Pearson's correlation coefficient)와 급내 상관계수(intraclass correlation coefficient, ICC)를 이용하였다.

6. 윤리적 고려

본 연구는 책임연구자 소속 대학 기관생명윤리위원회(No. GWNUIRB-2023-14-1)의 승인을 받은 후 진행하였다. 연구 참여는 연구 참여자의 자율적 의사에 따르며, 참여자의 익명성과 비밀 보장이 되고, 자료가 연구의 목적으로만 사용되며, 연구 참여 및 불참여 또는 참여 중단에 따른 불이익이 없고, 연구진행과정에서 언제든지 참여를 중단 또는 철회할 수 있음을 설명하였다. 모든 참여자들에게 연구 참여에 대한 서면 동의서를 받았으며, 설문 종료 후 소정의 음료 쿠폰을 제공하였다.

연구결과

1. 연구 참여자의 일반적 특성

본 연구 참여자는 간호사 9명, 간호조무사 19명, 요양보호사 133명이었다. 여성의 비율은 간호사의 100.0%, 간호조무사의 100%, 요양보호사의 91.7%였다. 평균 연령은 간호사 48.9±8.4세, 간호조무사 51.3±6.3세, 요양보호사 55.5±6.8세였다. 학력은 간호사의 경우 대졸이 6명(66.7%)으로 가장 많았고, 간호조무사와 요양보호사는 고졸이 각각 13명(68.4%), 85명(64.9%)으로 가장 많았다. 현 소속 기관의 근무 경력은 간호사의 경우 평균 5.99±7.76년, 간호조무사 4.11±5.80년, 요양보호사 3.61±4.21년이었으며, 면허(자격)증을 가지고 근무한 총 경력은 간호사의 경우 평균 17.72±5.37년, 간호조무사 10.89±7.51년, 요양보호사 5.88±5.14년이였다. 결혼 상태는 기혼이 121명(76.1%)으로 가장 많았고, 종교가 없는 경우가 59명(37.1%), 불교 41명(25.8%), 개신교 36명(22.6%) 순이었다. 현 소속 기관에서의 직위는 직접 간호/돌봄 제공자가 141명(88.7%)으로 가장 많았고, 중간관리자가 10명(6.3%) 순이었다. 소속 기관의 유형은 모두 노인요양시설로서, 100인 미만 시설이 60명(37.3%), 100인 이상 199인 이하 시설이 56명(34.8%), 200인 이상 시설이 45명(28.0%)이었다. 완화·생애말기 돌봄 교육 이수 경험에 없는 경우가 83명(51.9%), 현 소속 기관에서 완화·생애말기 돌봄을 하고 있지 않은 경우가 107명(67.7%)이었다. 또한 완화·생애말기 돌봄 교육이 실시된다면 참여를 원한다고 응답한 경우가 141명(88.7%)으로 나타났다(Table 1).

2. 도구의 구성타당도

도구의 구성타당도 분석 전, 자료(n=161)의 정규성을 확인하기 위해 문항의 왜도와 첨도를 분석하였다. 그 결과, 모든 문항의 왜도의 절대값(0.01~1.05), 첨도의 절대값(0.00~1.63)으로 정규성의 기준값(3 미만)을 충족하였다.

원 도구(3개 요인, 16문항)에 대해 확인적 요인분석으로 모형 적합도를 분석한 결과, X^2 271.43 (자유도 101, $p < .001$), normed X^2 (Q) 2.69, goodness of fit index (GFI) .82, normed fit index (NFI) .88, Tucker-Lewis index (TLI) .90, comparative fit index (CFI) .92, root mean-squared error of approximation (RMSEA) 값은 .10 (하한 .09, 상한 .12)이었다. Q, TLI와 CFI 값은 각각 좋은 모형의 기준값(< 3 , $\geq .90$, $\geq .90$)을 충족하였으나 나머지 값들은 기준에 부합하지 못하였다. 이에, 모형 적합도를 향상시키기 위해 수정지수(modification indices)가 10 이상인 문항들을 확인하여 수정지수가 큰 것부터 순차적으로 공분산을 설정한 후 재 분석하였다. 즉, 4번과 5번, 1번과 2번, 12번과 13번, 2번과 4번, 6

번과 13번, 2번과 5번, 8번과 12번 문항의 오차에 순차적으로 공분산을 설정하고 분석한 결과, X^2 172.43 (자유도 94, $p < .001$), Q 1.83, GFI .88, NFI .92, TLI .95, CFI .96, RMSEA .07 (하한 .05, 상한 .09)로 나와 모형의 적합도가 향상되었다(Table 2).

최종 모형의 확인적 요인분석의 타당성 평가를 위한 집중타당도와 판별타당도 검정 결과는 Table 3에 제시되었다. 집중타당도 확보 기준($CR \geq 0.7$)과 비교하여, 3개의 요인 모두 .86~.95로 나타나 집중타당도가 확보되었다. 판별타당도 확보 기준(요인 간 상관계수의 제곱 값 $< AVE$ 값)과 비교하여, 각 요인 간 상관계수의 제곱 값들이 0.30~0.47이었고, 이 값들은 요인별 AVE 값 .60~.72를 모두 넘지 않아 판별타당도가 확보되었다.

3. 도구의 집단 비교 타당도

도구의 집단 비교 타당도를 분석하기 전, 집단별 점수의 정규성 검정을 왜도와 첨도로 확인하였다. 직종별 평균 점수의 왜도, 첨도의 절대값이 모든 그룹에서 각각 0.35~0.66, 0.86~1.07로 나타났고, 완화·생애말기 돌봄 교육 이수 경험 유무에 따른 평균 점수의 왜도와 첨도의 절대값이 각각 0.07, 0.56, 0.17, 1.83으로 나타났다. 따라서 정규성 만족을 위한 기준값 3 [22]을 초과하지 않아 각각 one-way ANOVA와 t-test로 분석하였다. 연구대상자 전체(n=161)의 도구 평균 점수는 3.47 ± 0.65 점이었고, 직종별 평균 점수는 간호사(n=9) 3.84 ± 0.61 점, 간호조무사(n=19) 3.15 ± 0.42 점, 요양보호사(n=133) 3.49 ± 0.67 점으로, 유의한 차이가 있었다($F = 3.91$, $p < .022$). 즉, 사후 검정에서 간호사 군이 간호조무사 군보다 평균 점수가 높은 것으로 나타났다.

또한 완화·생애말기 돌봄 교육 이수 경험 유무에 따른 평균 점수는 경험이 있는 집단(n=77)이 3.69 ± 0.60 점, 경험이 없는 집단(n=83)이 3.25 ± 0.61 점으로, 유의한 차이를 보였다($t = 4.58$, $p < .001$).

4. 도구의 신뢰도 분석

1) 내적 일관성 신뢰도

전체 도구(16문항)에 대한 Cronbach's α 값은 .94였다. 문항 제거 시 Cronbach's α 값은 .94보다 높아지는 문항이 없어 내적 일관성에 문제가 되는 문항은 없었다. 각 요인별 Cronbach's α 값은 '요인 1 (의지)' .89, '요인 2 (역량)' .95, '요인 3 (회복력)' .85로 나타났다(Table 4).

2) 안정성 신뢰도

재검사 참여자는 총 25명(여자 24명과 남자 1명)이었다. 평균 연령은 51.4 ± 5.8 세였고, 간호사 4명, 간호조무사 5명, 요양보호사 16명이였다. 25명에 대한 1차 검사 점수는 평균 3.54 ± 0.66 점. 재검사

Table 1. General Characteristics of the Participants (N=161)

Variable	Category	RN (n=9)	NA (n=19)	Care workers (n=133)
Gender	Woman	9 (100.0)	19 (100.0)	122 (91.7)
	Man	-	-	11 (8.3)
Age (year)*	20~29	-	-	1 (0.8)
	30~39	1 (11.1)	1 (5.6)	2 (1.5)
	40~49	3 (33.3)	6 (33.3)	16 (12.1)
	50~59	4 (44.4)	10 (55.6)	77 (58.3)
	≥60	1 (11.1)	1 (5.6)	36 (27.3)
	Mean age (year)	48.9±8.4	51.3±6.3	55.5±6.8
Education*	<High school	-	-	17 (13.0)
	High school	-	13 (68.4)	85 (64.9)
	Diploma	1 (11.1)	4 (21.1)	18 (13.7)
	Bachelor	6 (66.7)	2 (10.5)	11 (8.4)
	≥Master	2 (22.2)	-	-
Work experience at current institution (year)*	<1	1 (11.1)	2 (11.8)	35 (26.9)
	1~<3	4 (44.4)	10 (58.8)	51 (39.2)
	3~<5	1 (11.1)	-	16 (12.3)
	≥5	3 (33.3)	5 (29.4)	28 (21.5)
	Mean duration (year)	5.99±7.76	4.11±5.80	3.61±4.21
Total work experience (year)*	<1	-	1 (5.3)	21 (16.2)
	1~<3	-	1 (5.3)	21 (16.2)
	3~<5	-	2 (10.5)	27 (20.8)
	≥5	9 (100.0)	15 (78.9)	61 (46.9)
	Mean duration (year)	17.72±5.37	10.89±7.51	5.88±5.14
Marital status*	Unmarried	12 (7.5)		
	Married	121 (76.1)		
	Bereavement	9 (5.7)		
	Divorced	16 (10.1)		
	Others	1 (0.6)		
Religion*	No religion	59 (37.1)		
	Protestant	36 (22.6)		
	Catholic	22 (13.8)		
	Buddhism	41 (25.8)		
	Others	1 (0.6)		
Position*	Direct care provider	141 (88.7)		
	Manager	10 (6.3)		
	Senior manager	2 (1.3)		
	Others	6 (3.8)		
Size of affiliated LTCF	<100 beds	60 (37.3)		
	100~199 beds	56 (34.8)		
	≥200 beds	45 (28.0)		
PEOLC education experience*	Yes	77 (48.1)		
	No	83 (51.9)		
Whether your facility provides PEOLC*	Yes	51 (32.3)		
	No	107 (67.7)		
Whether you want PEOLC education*	Yes	141 (88.7)		
	No	18 (11.3)		

Values are presented as *n* (%) or mean±standard deviation. The sum of the percentages does not equal 100% because of rounding. *Missing values excluded; LTCF=Long-term care facility; NA=Nurse aid; PEOLC=Palliative and end-of-life care; RN=Registered nurse.

Table 2. Confirmatory Factor Analysis for Three-Factor Model ($N=161$)

Fit index	χ^2	df	p	Q	GFI	NFI	TLI	CFI	RMSEA (90% CI)
Scale (early)	271.43	101	<.001	2.69	.82	.88	.90	.92	.10 (.09~.12)
Scale (final)	172.43	94	<.001	1.83	.88	.92	.95	.96	.07 (.05~.09)
Criteria			>.05	<3	≥.90	≥.90	≥.90	≥.90	<.05 (.08)

CFI=Comparative fit index; CI=Confidence interval; df=Degree of freedom; GFI=Goodness of fit index; NFI=Normed fit index; Q=Normed χ^2 ; RMSEA=Root mean-squared error of approximation; TLI=Turker-Lewis index.

Table 3. Convergent Validity and Discriminant Validity of the Scale ($N=161$)

Factor	Item no.	B	β	SE	F1	F2	F3	CR	AVE
F1 (willingness)	1	1.00	.78		1.00			.88	.60
	2	1.13	.84	0.08					
	3	1.07	.77	0.12					
	4	1.09	.76	0.12					
	5	0.89	.72	0.11					
F2 (capability)	6	1.00	.85		.55	1.00		.95	.72
	7	1.02	.80	0.08					
	8	0.85	.77	0.07					
	9	0.99	.86	0.07					
	10	1.06	.87	0.07					
	11	1.11	.89	0.07					
	12	1.16	.89	0.08					
	13	1.18	.87	0.09					
F3 (resilience)	14	1.00	.76		.68	.67	1.00	.86	.67
	15	0.97	.81	0.10					
	16	1.31	.88	0.12					

AVE=Average variance extracted; CR=Construct reliability; F=Factor; SE=Standard error.

Table 4. Internal Consistency Reliability of the Scale ($N=161$)

Factor	Item no.	Cronbach's α for deleted item	Cronbach's α
F1 (willingness)	1	.94	.89
	2	.94	
	3	.94	
	4	.94	
	5	.94	
F2 (capability)	6	.94	.95
	7	.94	
	8	.94	
	9	.94	
	10	.94	
	11	.94	
	12	.94	
	13	.94	
F3 (resilience)	14	.94	.85
	15	.94	
	16	.94	
Total scale Cronbach's $\alpha=.94$			

F=Factor.

점수는 평균 3.59 ± 0.62 점으로 나타났다. 도구의 검사-재검사 간 피어슨 상관계수 값은 .86 ($p < .001$), ICC 값은 .91 (95% confidence interval: .85~.96)이었다.

논의

본 연구에서는 장기요양시설 종사자의 완화·생애말기돌봄 준비도 측정 도구가 우리나라 장기요양시설 환경에서 적용할 수 있는 적절한 도구인지를 알기 위해 한국어판 도구로 번안하고 타당도와 신뢰도를 평가하였다. 본 도구는 WHO의 체크리스트에 따라 점정되었으며[20], 1번 문항의 경우, 한글 의미에서 다중성이 발생할 수 있는 지점에 대하여 원저자에게 의미의 정확성 정도를 확인받아 본 연구에서는 일상생활(예: 개인위생, 식사, 배설 등)로 제시하여 번역으로 발생할 수 있는 의미에 대한 혼선을 줄여 항목을 명확히 하였다. 측정 도구 개발에서, 번안한 도구의 경우는 수용하고자 하는 나라의 언어적이고 문화적 타당성 과정을 절차에 따라 완성하여 그 의미를 명확히 할 수 있다[18]. 본 연구의 도구에서는 번역된 용어를 국내의 문화적이고 언어적 특성을 반영할 수 있도록 구체적 예시를 들어 원저자에게 의미를 확인받는 과정을 거쳐 더욱 명확한 의미를 제시하였

다고 판단된다.

도구의 요인 구조가 Chan 등[13]의 연구에서 세 개의 요인으로 확정되었으므로, 본 연구에서는 문화적 차이나 인구집단의 변화에도 제대로 측정하고 있는지 확인하기 위해, 구성 영역별 확인적 요인분석을 실시하였다[23]. 일반적으로 CFI와 TLI는 그 값이 클수록, RMSEA는 작을수록 적절하데, CFI와 TLI는 .90 이상일 때 양호한 것으로 평가되며, RMSEA는 .08 이하면 양호한 적합도, .05 이하면 매우 좋은 적합도로 간주된다[25]. 본 연구에서 모형의 적합도를 검토하였을 때, 절대적합도 지수인 RMSEA가 .07로 양호한 적합도를 보이며, 상대적합도 지수인 TLI .95, CFI .96으로 나타나 본 도구가 모형 적합도 기준에 부합한다고[26] 판단된다. 집중타당도와 판별타당도 검정을 통해 3개의 요인인 '의지', '역량', '회복력'이 모두 .86~.95로 나타나 집중타당도가 확보되었으며, 판별타당도 확보 기준(요인 간 상관계수의 제곱 값 < AVE 값) 값들은 요인별 AVE 값 .60~.72를 모두 넘지 않아 판별타당도가 확보되었다고[27] 판단된다. '의지'의 5개 문항은 생애말기 노인을 돌보는 것에 대한 수용과 자신감을 측정하며, 이는 죽음에 대한 간호종사자의 긍정적인 태도와 임종간호에 대한 주체성과 관계되어 있다. '역량'의 8개 문항은 완화·생애말기 돌봄 지식과 기술을 측정하며, 임종의 신체적 징후를 알고 적절하게 대응하는 것을 의미한다. '회복력'의 3개 문항은 생애말기 노인 그 가족을 돌볼 때 발생하는 스트레스와 정서적 소모 상황에 대한 대처 능력을 측정하는데 적절한 문항으로, 임종 이후 자책이나 죄책감과 같은 간호종사자의 심리적 요소를 긍정적으로 전환할 수 있는 태도와 지지적 활용을 평가하는 내용이다. 각각의 문항들이 다른 요인에 포함된 문항들과 구별됨을 확인하였으며, 요인 내 16개의 모든 항목들이 도구의 구성개념을 일관되게 측정하고 있음을 확인하였다.

도구의 집단 비교 타당도를 검토하였을 때, 간호사 군($n=9$)이 3.84 ± 0.61 점으로 간호조무사 군($n=19$)의 3.15 ± 0.42 점보다 평균 점수가 높은 것으로 나타났다. Chan 등[13]의 연구에서는 전문가 그룹과 돌봄 보조 인력의 점수 차이가 명확하게 구분되었던 반면, 본 연구에서 간호사-간호조무사는 유의한 차이가 있었지만 간호사-요양보호사 간에는 간호사의 평균 점수가 높기는 하였으나 통계적으로 유의한 차이가 없었다. 이러한 차이는 간호사의 표본 수가 간호조무사나 요양보호사에 비해 적은 것과 관련지어 생각해 볼 수 있다. 또한 완화·생애말기 돌봄 교육 경험 유무에 따라 평균 점수의 차이를 분석했을 때, 교육 경험이 있는 군($n=77$)이 3.69 ± 0.60 점으로 교육 경험이 없는 군($n=83$), 3.25 ± 0.61 점보다 평균 점수가 높았다. Anstey 등[12]과 Durojaiye 등[24]의 연구에서 완화·생애말기 돌봄 교육 시행 후 돌봄 준비도와 자신감 및 태도가 향상되었다는 것을 바탕으로 보아 본 연구에서 완화·생애말기 돌봄 교육 경험의 유무로 나눈 집단 간 점수 차이($t=4.58$, $p<.001$)를 통해 집단 비교 타당도가 부분적으로 확보되었다고[28] 판단된다.

도구의 신뢰도 분석은 내적 일관성과 안정성을 통해 확인하였다.

본 연구에서 검사-재검사 신뢰도 측정 기간을 3주로 둔 것은 재검사 간격을 2주나 4주로 두는 것에 비해 기억이나 동기 요인(예: 중재나 교육 등)들로부터 재검사 점수가 영향받는 것을 최대한 배제하고자 했기 때문이다[28]. 내적 일관성 분석 결과 Cronbach's α 는 .94로 원 도구 개발 당시의 Cronbach's α 인 .93과 유사하였다. 3개의 하위 요인별 Cronbach's α '의지' .79, '역량' .95, '회복력' .85로, 원 도구에서 제시한 하위 요인별 Cronbach's α '의지' .90, '역량' .94, '회복력' .75에 비해 의지와 회복력은 낮게, 역량은 비슷한 수준으로 확인되었다. 또한 도구 안정성 부분에서도 도구의 검사-재검사 간 피어슨 상관관계수 값은 .86 ($p<.001$), ICC 값은 .91로 검사-재검사 신뢰도 계수인 .90에 비해 높게 나타났다. 피어슨 상관관계수가 .7~.9 미만인 경우 높은 상관관계를 나타내며, C 값의 범위가 .75~1.00이면 안정성 신뢰도가 매우 좋음(excellent)을 의미한다[26]. 따라서 본 도구의 안정성 신뢰도가 매우 좋으며, 하위 요인들의 안정성 신뢰도도 매우 좋은 것으로 확인되었다.

국내·외에서 완화 및 생애말기 돌봄에 대하여 다양한 도구를 사용하여 그 정도를 평가하고 있다. PANA 설문지[14]의 40문항은 nursing assistants를 대상으로 구체적인 완화 돌봄에 대한 지식과 기술 및 태도를 묻고 있다는 장점이 있는 반면에, 검사-재검사 결과, ICC가 0.335로 낮게 나와 안정성이 다소 낮은 것으로 나타났다. Karacsony 등 [14]은 이에 대해 재검사 참여자가 소수였고($n=15$), 개인의 돌봄 경험 정도와 수행하는 돌봄 역할, 직장에 따른 만족도나 감정 변화에 따라 지식점수가 영향받을 수 있음을 설명하고 있다. 따라서 국내 장기요양시설에서 완화·생애말기 돌봄에 직·간접적으로 참여하는 간호종사자를 포괄하는 돌봄 준비도 측정 도구로 유용하지 않을 수 있다. 또한 국내의 Kim과 Lee [29]가 27문항으로 개발한 임종간호 교육요구도 측정 도구는 Cronbach's α .92의 신뢰도가 있는 도구이지만 아동 호스피스나 마약성 진통제 관리의 문항들이 포함되어 있다. 즉, 이 도구는 국내 치매 환자가 다수를 차지하는 장기요양시설의 특성을 반영하지 못하고 있어 국내 장기요양시설의 간호제공자 준비도 측정 도구로 사용하기에 무리가 있다. 특히, 장기요양시설 간호제공자를 위한 도구는 측정 시 유용성과 효용성이 중요하다. 종합병원에 비해 장기요양시설 간호제공자들은 만성적인 인력 부족 및 고된 육체적 업무강도를 가진다는 보고가 있으므로[30], 도구 측정 시 대상자의 이러한 특성을 고려해야 한다. 따라서 40문항의 PANA 도구나 27문항의 임종간호 교육요구도 측정 도구와는 달리 상대적으로 적은 16문항으로 구성된 본 연구 도구는 설문에 평균 11분이 소요되어 바쁜 업무 중에 간단하게 적용해 볼 수 있는 점과 '의지', '역량', '회복력'의 하위 요인 내에 완화·생애말기 돌봄에 대한 지식, 기술, 태도가 모두 포함된 점 등을 고려해 볼 때, 응답자의 특성을 잘 반영한 도구로 볼 수 있다.

본 연구에서 국내 장기요양시설 간호종사자를 대상으로 활용할 수 있는 완화·생애말기 돌봄 준비도 측정 도구가 신뢰도와 타당도가 있

음을 확인하였다. 본 도구를 활용하여 장기요양시설 간호종사자의 완화·생애말기 돌봄 준비도 정도를 파악하여 그들의 역량을 향상시키고 완화·생애말기 돌봄의 질적 수준을 높이는 데 도움이 되기를 기대한다. 그러나 본 연구는 국내의 유사한 개념을 측정할 수 있는 준거 도구가 없어 동시타당도를 확인할 수 없었다는 제한점이 있으므로, 추후 완화 및 생애말기 돌봄과 관련 있는 개념으로 확장하여 동시타당도를 확인할 필요가 있다.

결론 및 제언

본 연구에서는 장기요양시설 간호제공자의 완화·생애말기 돌봄 측정도구를 한국어로 번역하고 도구의 구성타당도, 집중타당도, 판별타당도, 그룹 간 평균 점수 비교, 검사-재검사 신뢰도 검정 등을 통해 도구의 적합성 정도를 확인하였다. 그 결과, 본 도구가 국내 장기요양시설에서 완화·생애말기 돌봄을 제공하는 간호제공자들을 대상으로 완화·생애말기 돌봄을 평가하는 측정 도구로 활용될 수 있음을 확인하였다.

본 연구의 강점은 다음과 같다. 첫째, 기존에 국내에서 언급되지 않았던 장기요양시설 간호제공자의 완화·생애말기 돌봄에 대한 도구의 타당도와 신뢰도를 검증하여 제공하였다는 데 의의가 있다. 최근 장기요양시설 간호제공자들이 제공하는 간호와 돌봄에 대한 세간의 관심이 점점 더 커지고 있는 시점에서, 장기요양시설에서 제공되는 완화·생애말기 돌봄에 대하여 인식하고 평가하여 폭넓게 활용될 수 있는 도구를 제안하였는 데 그 의의가 있다. 또한 국내 장기요양시설의 환경을 고려하여 간호제공자를 포괄하는 맞춤형 도구로 연구를 진행하였다는 데 의의가 있다. 둘째, 본 연구 도구는 장기요양시설에서 간호제공자의 완화·생애말기 돌봄 교육프로그램의 효과를 평가할 수 있는 타당도와 신뢰도가 검증된 전문화된 측정 도구로 프로그램 개발과 효과측정에 기여할 수 있다는 점에서 의의를 지닌다. 또한 도구의 하위 요인인 의지, 역량, 회복력 요인들은 장기요양시설 간호제공자들의 의지와 역량, 회복력 정도를 파악하여 보완할 수 있고, 지속적인 교육을 통해 간호 실무에 기여할 것이라 생각된다. 신뢰도와 타당도가 검증된 본 연구 도구는 추후 국내 관련 연구에 측정 도구로 유용하게 활용될 수 있을 것으로 기대한다. 이를 바탕으로 추후 노인요양공동생활가정과 같은 다른 유형의 장기요양시설에서 도구의 신뢰도와 타당도를 확대하여 연구할 필요가 있다. 마지막으로 본 연구 도구는 번안한 도구이므로 다른 문화권에서 개발된 번역 도구로 문화적 차이가 있을 수 있어 한국판 도구의 개발이 필요함을 제언한다.

ORCID

Soo Jung Chang, <https://orcid.org/0000-0003-1457-6185>
Seongmi Moon, <https://orcid.org/0000-0003-4384-0088>

Na Kyoung Lee, <https://orcid.org/0000-0002-2286-6281>

Authors' contribution

Conceptualization - SJC, SM; Data curation - SJC, NKL; Formal analysis - All authors; Funding acquisition - SJC; Methodology - SJC, SM; Project administration - SJC; Supervision - SJC; Writing—original draft, review & editing - All authors

Conflict of interest

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

Funding

This study was conducted with support from the National Research Foundation of Korea with funding from the government (Ministry of Science and ICT) (No. 2022R1F1A1071440).

Data availability

Please contact the corresponding author for data availability.

Acknowledgements

We would like to express our sincere gratitude to Dr. D.R. Kim, Dr. E. Cho, Dr. J. Cheon, Dr. J. Lee, Dr. K.K. Kim, Dr. S. Moon, Dr. S. Lee, Dr. Sr. Y.J. Ro, and MD. M. Lee for their valuable contributions.

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요양병원 노인의 죽음불안, 사회적 지지가 임종치료선호도에 미치는 영향: 서술적 단면 조사 연구

정지훈¹, 박희옥²

¹계명대학교 간호대학원 박사과정, ²계명대학교 간호대학 간호과학연구소 교수

The effects of death anxiety and social support on the preferences for care near the end of life in older adults staying at long-term care hospitals: A cross-sectional, descriptive study

Ji Hun Joung¹, Heeok Park²

¹Doctoral Student, Graduate School of Nursing, Keimyung University, Daegu, Korea

²Professor, College of Nursing · Research Institute of Nursing Science, Keimyung University, Daegu, Korea

Received: September 30, 2023

Revised: February 14, 2024

Accepted: February 15, 2024

Corresponding author:

Heeok Park

College of Nursing · Research
Institute of Nursing Science,
Keimyung University, 1095
Dalgubeol-daero, Dalseo-gu, Daegu
42601, Korea
TEL: +82-53-258-7655
E-mail: hopark@kmu.ac.kr

Purpose: The purpose of this study was to investigate the effects of death anxiety and social support on the preferences for care near the end of life in older adults staying at long-term care hospitals. By understanding these relationships among the factors, we provide crucial insights for enhancing end-of-life care with respect to patients' end-of-life care preferences. **Methods:** This was a cross-sectional study. A total of 155 older adults staying at long-term care hospitals participated in the study. Data collection was performed from January 9, 2023 to March 9, 2023. The data were analyzed using descriptive statistics, t-tests, ANOVA, Pearson correlation coefficients, and hierarchical multiple regression analysis. **Results:** The results of this study show that death anxiety ($\beta=.23, p=.002$), social support ($\beta=.22, p=.003$), intensive care transfer ($\beta=.18, p=.022$), and severity of illness ($\beta=.16, p=.033$) were significantly affecting factors to the care preferences near the end of life in older adults staying at long-term care hospitals. **Conclusion:** Understanding the end-of-life care preferences of older adults with death anxiety in long-term care hospitals is important. Expressing these preferences in a timely manner requires extensive support from patients, family, and health professionals. Developing an effective program for end-of-life care preferences is continuously needed for future studies.

Keywords: Long-term care; Terminal care; Anxiety; Social support

서론

1. 연구의 필요성

임종은 누구나 경험하는 자연적이고 정상적인 과정이나 그 과정과 결과를 예측하기 어렵다. 임종치료는 임종을 앞둔 대상자가 인간으

로서의 존엄성과 삶의 질을 최대한 유지하면서 삶의 마지막까지 편안하게 보낼 수 있도록 의료인과 가족이 제공하는 총체적인 돌봄이다[1]. 임종치료 적용 중에 대상자의 연명의료가 의미 있는 돌봄인지에 대한 여부가 이슈화되고 있다[2].

노인의 74.8%가 의료기관에서 사망하고 있고, 노인의 임종 장소는 가정에서 의료기관으로 변화되고 있다[3]. 노인의 좋은 죽음은 존

엄한 대우를 받으며 가치관이나 신념, 자율성이 보장되는 것으로 인식되고 있으나[4], 갑작스러운 건강 악화로 임종치료의 범위를 결정하지 못하면 좋은 죽음을 경험하기 어렵다[5]. 특히 요양병원 노인은 고령과 만성질환으로 인해 기능 감소와 일상생활의 영위가 어렵고, 입원기간이 길어질수록 죽음에 대한 생각이 부정적으로 변화되기 때문에[4], 요양병원 노인의 죽음에 대한 생각이 긍정적으로 변화될 수 있도록 돕는 것이 중요하다.

노인의 좋은 죽음 경험을 위해 임종치료선호도를 확인하는 것이 필요한데[4], 임종치료선호도는 자신의 의학적 상태가 치료 불가능한 상황에서 어떤 방식의 생명연장술을 원하는지에 대한 개인 선호도를 밝히는 것으로, 임종치료선호도가 높은 것은 임종 시 개인이 받고자 하는 치료에 대한 선호도가 높은 것을 의미한다[4]. 이는 단순한 생명연장술에서 벗어나 대상자의 존엄사를 가능하게 하며, 임종 시 자신의 선호도에 따라 임종치료를 선택할 수 있는 중요한 요소이다[4]. 임종치료선호도는 가치관, 종교, 철학, 개인의 생활습관에 따라 다를 수 있으며, 죽음을 어떻게 이해하고 받아들이는지에 따라 달라질 수 있어[4], 영향을 미치는 요인을 확인하는 것이 중요하다.

임종치료선호도의 관련요인에 관한 연구에 따르면 성인의 지식, 태도, 신념 및 문화 등에 따라 임종치료선호도가 다르게 나타났고[6], 특히 요양병원에 거주하는 노인의 자아통합감과 요양시설 노인의 삶의 질이 높은 경우 임종치료선호도가 높게 나타났으며, 복지관 노인의 죽음준비도가 높은 경우에도 임종치료선호도가 높게 나타났다[7-9]. 이와 같이 임종치료선호도와 관련성을 확인하기 위해 문화, 자아통합감, 삶의 질 및 죽음준비도와 같은 요인들이 보고되었으나 그 외 개념들과의 관계를 보고한 연구가 부족하여 확인할 필요가 있다.

임종치료선호도의 관련요인으로서는 연령, 결혼, 교육 및 소득수준, 종교 등이 보고되었는데[2,4,6,9], 특히 연령이 높고 미혼 노인이 임종치료선호도가 높게 나타났고, 소득수준이 낮고 종교를 가진 노인이 임종치료선호도가 높은 것으로 나타났다. 이와 같이 임종치료선호도의 관련요인으로 연령, 성별, 자아통합감, 삶의 질 및 죽음준비도 등과 요인이 보고되었으나 요양병원 노인을 대상으로 요양병원 노인의 특성에 적합한 개념들과의 관계를 확인할 필요가 있다.

먼저, 요양병원 노인은 요양병원에 거주하면서 연 평균적으로 매주 다른 노인의 죽음을 간접적으로 경험하면서 죽음불안이 높은 실정이다[10]. 노인은 신체적, 정신적 허약으로 인해 죽음불안을 강하게 느끼고, 죽음을 자주 직면하기 때문에 죽음불안이 더 높다[11]. 죽음불안은 죽음에 대한 공포나 혐오, 부정 등으로 죽어가는 과정에서 오는 두려움과 긴장, 존재의 정지를 의미하며 노년기 삶에 부정적 영향을 미쳐[12] 죽음불안을 낮추는 것이 중요하다. 이러한 죽음불안은 요양병원 노인의 연령, 학력, 신체기능저하, 자아통합감, 정신적 및 정서적 장애로 인해 가속화되는데[13], 복지관 노인의 죽음불안과 임종치료선호도와 관계는 보고되었으나[9], 요양병원 노인을 대상으로 한 죽음불안과 임종치료선호도와 관계를 보고한 연구는 부재한

실정이다. 요양병원 노인은 특히 죽음을 자주 직면하고 다양한 질병으로 인해 임종을 생각하게 되며[11] 이로 인해 임종치료선호도를 결정할 기회에 자주 노출되므로 이들의 죽음불안이 임종치료선호도에 영향을 미치는지 확인할 필요가 있다.

또한 요양병원 노인은 가족과 떨어져 지내고 있어 심리적 불안감과 고독감을 경험하며[14], 의료인과의 적극적인 의사소통 및 가족의 의사결정 참여를 비롯한 사회적 지지가 부족한 실정이다. 사회적 지지는 개인이 사회적 유대를 통해 정서적, 도구적, 구조적 지원 요소가 포함된 기능적 지원을 의미하는 것으로 건강을 위한 긍정적인 자원을 제공하는 역할을 한다[15]. 요양병원 노인은 임종치료 시 가족 및 의료진과 소통하기 원하고, 의료인의 의학적 소견을 들으며 가족과 함께 의사결정하는 것을 중요하게 생각하여 사회적 지지가 더 요구된다[8]. 요양병원 노인은 치료받고 임종을 맞이하는 동안 가족과 의료진에게 더욱 의존하게 되는데[16], 이러한 지지적인 환경이 현실적으로 원활하게 수행되는 것이 어려워 보완이 필요한 상태이다. 이와 같이 노인의 사회적 지지는 임종치료를 수행하고 임종치료선호도를 결정할 때 영향을 미치는 주요 요인으로 사료되나 최근까지 요양병원 노인의 사회적 지지와 임종치료선호도와 관계를 확인한 연구는 부재하여 이를 확인할 필요가 있다. 따라서 본 연구는 요양병원 노인의 임종치료선호도를 파악하고, 죽음불안과 사회적 지지가 임종치료선호도에 미치는 영향을 분석하고자 한다.

2. 연구목적

본 연구의 목적은 요양병원 노인의 죽음불안, 사회적 지지와 임종치료선호도의 관계를 파악하고, 임종치료선호도에 미치는 영향을 확인함으로써 요양병원 노인의 임종치료선호도를 높이고 임종치료 개선을 위한 기초자료를 마련하고자 한다.

연구방법

Ethic statement: This study was approved by the Institutional Review Board (IRB) of Keimyung University (IRB No: 40525-202207-HR-038-03). Informed consent was obtained from the participants.

1. 연구설계

본 연구는 요양병원 노인의 죽음불안, 사회적 지지가 임종치료선호도에 미치는 영향을 확인하기 위한 서술적 조사 연구이다. 이 연구는 Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) 보고 지침(<http://www.strobe-statement.org>)에 따라 기술하였다.

2. 연구대상

본 연구는 대구광역시 소재 2개의 요양병원에 입원한 노인환자를 대상으로 수행되었다. 대상자 선정기준은 1) 요양병원에 입원 중인 65세 이상인 자; 2) 의사소통이 가능하고 간이정신상태검사(Korean Mini-Mental State Examination) 측정 값이 24점 이상으로 인지 장애가 없는 자; 3) 우울증, 정신지체 및 정신분열증 등 주요 정신 질환이 없는 자; 4) 본 연구의 목적을 이해하고 자발적으로 서면동의한 자이다.

본 연구의 대상자 수는 Baek과 Song [7]이 임종치료선호도 관련 요인을 조사한 선행연구에 근거하여 G*power 3.1.9.4 프로그램을 이용하여 검정력 .80, 효과크기 .15, 유의수준 .05, 예측변수 16개, 위계적 다중회귀분석을 근거로 산출한 결과 143명으로 산출되었다. 탈락률 10%를 고려하여 총 159명에게 설문지를 배부되었고, 회수된 설문지 중 응답이 불충분한 4부를 제외한 총 155명의 설문내용이 자료분석에 포함되었다.

3. 연구도구

1) 대상자 특성

대상자 특성은 일반적 특성, 요양병원 관련 특성, 건강관련 특성으로 총 14문항으로 구성하였다. 일반적 특성은 성별, 연령, 최종 학력, 종교, 월평균소득으로 총 5문항이며, 요양병원관련 특성은 입원 전 동거 여부, 현 요양병원 총 입원 수, 현 요양병원 입원 기간, 면회 횟수, 중환자실 입원 경험으로 총 5문항, 건강관련 특성은 건강 상태 지각, 일상생활능력, 입원 시 주 상병, 질병중증도로 총 4문항이다. 질병중증도는 건강보험심사평가원에서 요양병원 요양급여비용 청구 시 사용되는 '7개 환자분류군'(a. 의료 최고도, b. 의료 고도, c. 의료 중도, d. 의료 경도, e. 문제행동군, f. 인지장애군, g. 신체기능 저하군)에 근거하여[17], 본 연구의 필요에 따라 4개 환자분류군(의료 고도[a & b], 의료 중도[c], 의료 경도[d], 선택입원군[e & f & g])으로 구분하였다.

2) 죽음불안

죽음불안은 Templer [18]가 개발한 죽음불안척도(Death Anxiety Scale)를 Go 등[19]이 한국인에게 적합하게 변안한 도구로 측정하였다. 죽음불안 도구는 총 15문항으로 1, 2, 3, 6, 7, 15번은 역문항이다. 응답범주는 '매우 그렇다' 5점, '조금 그렇다' 4점, '그렇다' 3점, '그렇지 않다' 2점, '전혀 그렇지 않다' 1점으로 구성된 5점 Likert 척도이며, 점수가 높을수록 죽음불안이 높은 것을 의미한다. 개발 당시 도구의 신뢰도 Cronbach's α 는 .83이었고, Go 등[19]의 연구에서 도구의 신뢰도 Cronbach's α 는 .80, 본 연구에서 신뢰도 Cronbach's α 는 .70이었다.

3) 사회적 지지

사회적 지지는 Kim [20]이 개발한 사회적 지지 척도를 Choi [21]가 만성신부전 환자에 적합하게 수정 및 보완하여 작성한 도구로 측정하였다. 사회적 지지 도구는 가족지지 12문항과 의료인지지 8문항, 총 20문항으로 구성되었다. 응답범주는 '매우 그렇다' 5점, '대체로 그렇다' 4점, '보통이다' 3점, '대체로 그렇지 않다' 2점, '전혀 그렇지 않다' 1점으로 구성된 5점 Likert 척도이며, 측정점수가 높을수록 사회적 지지 정도가 높음을 의미한다. 개발 당시 도구의 신뢰도 Cronbach's α 는 .94였고, Choi [21]의 연구에서 Cronbach's α 값은 .94, 본 연구에서 Cronbach's α 값은 .80이었다.

4) 임종치료선호도

임종치료선호도는 Gauthier와 Froman [1]이 개발한 임종치료선호도(preferences for care near the end of life scale)을 Lee와 Kim [22]이 번역하고 수정, 보완한 한국어판 임종치료선호도로 측정하였다. 본 도구는 자율적 의사결정 8문항, 영성 6문항, 가족 5문항, 의료인에 의한 의사결정 4문항, 통증 3문항으로 총 26문항이며, 1, 2, 4, 6, 15번은 역문항이다. 본 도구는 5점 Likert 척도로 '매우 그렇다' 5점, '그렇다' 4점, '보통이다' 3점, '아니다' 2점, '매우 아니다' 1점으로 점수가 높을수록 임종치료선호도가 높은 것으로 임종치료에 대한 수행 선호도가 높은 것을 의미한다[4]. 개발 당시 도구의 신뢰도 Cronbach's α 는 .68~.91이었고, Lee와 Kim [22]의 연구에서 Cronbach's α 값은 .42~.89, 본 연구에서 Cronbach's α 값은 .48~.81이었다.

4. 자료수집

자료수집 기간은 2023년 1월 9일부터 3월 9일까지 수행되었다. 연구자는 대구광역시에 위치한 200병상 이상의 요양병원 34개 기관장에게 연락하여 본 연구에 대해 설명하고 방문을 허락한 2개 병원을 직접 방문하여 간호부서장에게 연구목적과 연구방법을 설명하고 협조를 구하였다. 본 연구자는 대상자에게 연구목적 및 방법, 자료수집 방법 등에 대해 설명하고 참여에 동의한 자를 대상으로 서면동의를 받고 설문지를 사용하여 자료수집을 수행하였다.

대상자가 직접 설문지에 대한 답변을 작성하였고, 직접 작성의 어려움이 있는 경우 연구자가 설문지의 내용을 읽어주고 대상자의 응답을 대신 표기하였다. 설문지 작성 시 소요된 시간은 20~30분 정도였고, 설문 조사를 마친 대상자에게는 소정의 답례품을 제공하였다.

5. 윤리적 고려

본 연구는 연구대상자 보호를 위해 계명대학교 생명윤리심의위원회(Institutional Review Board, IRB) 승인(IRB No: 40525-

202207-HR-038-03)을 받은 후 진행되었다. 연구자가 자료수집 전 대상자에게 연구의 목적, 절차, 설문지 작성 예상시간, 익명성과 비밀보장, 연구참여로 인한 불이익이 없음을 설명하였고, 설문지 작성 중에 참여를 원치 않을 경우 설문조사를 언제든지 중단할 수 있음을 충분히 설명하였다. 대상자가 자발적으로 동의서에 서명을 한 후 자료수집이 시작되었다. 수집된 자료는 대상자의 비밀보장을 위해 잠금 번호가 설정되어 있는 연구자의 노트북에서 직접 코딩 및 통계처리되었고, 연구자료는 잠금장치가 있는 곳에 3년간 보관 후 완전폐기될 예정이다.

6. 자료분석

수집된 자료는 SPSS 27.0 program (IBM Corp.)을 이용하여 다 음의 통계 방법으로 분석하였다: 1) 대상자의 일반적 특성, 죽음불안, 사회적 지지 및 임종치료선호도는 기술통계를 사용하여 분석하였다; 2) 대상자의 일반적 특성에 따른 임종치료선호도의 차이는 t-test와 ANOVA로 분석하였고, 사후검정을 위해 Scheffe test로 분석하였다; 3) 대상자의 죽음불안과 사회적 지지 및 임종치료선호도 간의 상관관계는 Pearson correlation coefficients로 분석하였다; 4) 죽음불안과 사회적 지지가 임종치료선호도에 미치는 영향은 위계적 다중회귀분석(hierarchical multiple regression analysis)으로 분석하였다.

연구결과

1. 대상자의 일반적 특성

대상자의 특성은 Table 1과 같다. 일반적 특성의 경우 성별은 여자 83명(53.5%), 남자 72명(46.5%)이었으며, 평균 연령은 78.1 ± 6.8 세로 81세 이상이 55명(35.5%)으로 가장 많았다. 최종 학력은 초졸 이하 60명(38.7%), 종교는 기독교와 천주교 60명(38.7%), 월평균소득은 100만 원 미만인 69명(44.5%)으로 가장 많았다.

요양병원 관련 특성의 경우 입원 전 동거 여부는 유(Yes) 106명(68.4%), 동거인은 자녀 64명(48.9%), 요양병원 총 입원 수는 2회 64명(41.2%), 요양병원 입원기간은 12개월 이상 24개월 미만 55명(35.5%), 면회 횟수는 월 1회 이상이 109명(70.3%), 중환자실 입원 경험은 무(No)가 111명(71.6%)으로 가장 많았다.

건강관련 특성 중 건강상태 지각은 나쁨 105명(67.7%), 일상생활 능력은 전적인 도움이 67명(43.2%), 입원 시 주 상병은 뇌신경계 질환 48명(22.6%), 질병중증도는 의료 고도 이상이 44명(28.4%)으로 가장 많았다.

Table 1. Subjects' General Characteristics (N=155)

Characteristic	Category	n (%)	Mean±SD
General characteristics	Gender		
	Man	72 (46.5)	
	Woman	83 (53.5)	
	Age (year)		78.1±6.8
	65~70	22 (14.2)	
	71~75	43 (27.7)	
	76~80	35 (22.6)	
	≥81	55 (35.5)	
	Education		
	Elementary school graduated	60 (38.7)	
	Middle school graduated	28 (18.1)	
	High school graduated	37 (23.9)	
	University graduated	30 (19.4)	
	Religion		
	Christian, catholicism	60 (38.7)	
LTC hospital characteristics	Buddhism	46 (29.7)	
	None	39 (25.2)	
	Others*	10 (6.5)	
	Monthly income (10,000 won)		
	<100	69 (44.5)	
	≥100~<200	54 (34.8)	
	≥201	32 (20.6)	
	Living together before hospitalization		
	Yes	106 (68.4)	
	No	49 (31.6)	
	Cohabitation [†]		
	Spouse	49 (37.4)	
	Sons and daughters	64 (48.9)	
	Others [‡]	18 (13.7)	
	Number of admission at LTC hospital		
	1	50 (32.3)	
	2	64 (41.2)	
	≥3	41 (26.5)	
	Duration of staying at LTC hospital (month)		19.0±11.7
	6~<12	53 (34.2)	
	≥12~<24	55 (35.5)	
	≥24	47 (30.3)	
	Number of visits to LTC hospital		
	Once a week	9 (5.8)	
	Once every 2 weeks	23 (14.8)	
	Once a month	109 (70.3)	
	None	14 (9.0)	
	Intensive care transfer		
	Yes	44 (28.4)	
	No	111 (71.6)	

(Continued to the next page)

Table 1. Continued

Characteristic	Category	n (%)	Mean±SD
Perception of health status	Poor	105 (67.7)	
	Moderate	38 (24.5)	
	Good	12 (7.7)	
Activities of daily living	Independent	42 (27.1)	
	Dependent partially	46 (29.7)	
	Dependent	67 (43.2)	
Disease (diagnosed) [§]	Respiratory diseases	46 (21.7)	
	Cardiovascular disease	44 (20.8)	
	Cranial nervous system disease	48 (22.6)	
	Diabetes	34 (16.0)	
	Cancer	18 (8.5)	
	Others	22 (10.4)	
Severity of disease	High	44 (28.4)	
	Medium	38 (24.5)	
	Mild	39 (25.2)	
	Selective hospitalization group [†]	34 (21.9)	

The sum of the percentages does not equal 100% because of rounding. *Shincheonji, Soka Gakkai International; [†]Multiple response, n=131; [‡]Parents, brothers, nephews; [§]Multiple response, n=212; ^{||}Cardiovascular disease, urinary tract infection, spinal canal stenosis; [†]Behavior problem, impaired cognition, physical reduced; LTC=Long-term care; SD=Standard deviation.

2. 대상자의 죽음불안과 사회적 지지 및 임종치료선호도의 정도

대상자의 죽음불안과 사회적 지지 및 임종치료선호도의 정도는 Table 2와 같다. 대상자의 죽음불안은 5점 만점에 3.15 ± 0.43 점으로, 하위영역에는 죽음 연관사건에 대한 두려움 3.28 ± 0.56 점, 짧은 시간 지각 3.26 ± 0.87 점, 죽음에 대한 두려움은 3.09 ± 0.54 점, 죽음 생각 부인은 2.77 ± 0.91 점으로 나타났다. 대상자의 사회적 지지는 5점 만점에 3.19 ± 0.45 점으로 하위영역에는 의료인지지 3.22 ± 0.57 점, 가족지지 3.17 ± 0.53 점으로 나타났다. 대상자의 임종치료선호도는 5점 만점에 3.11 ± 0.30 점으로, 하위영역에는 통증요인 3.67 ± 1.02 점, 영성요인 3.43 ± 0.72 점, 가족요인 3.19 ± 0.55 점, 의료인에 의한 의사결정 2.92 ± 0.64 점, 자율적 의사결정 2.72 ± 0.46 점으로 나타났다.

3. 대상자의 일반적 특성에 따른 임종치료선호도의 차이

대상자의 일반적 특성에 따른 임종치료선호도의 차이는 Table 3과 같다. 대상자는 일반적 특성에서 월평균소득($F = 3.63, p = .029$)에 따라 임종치료선호도에 차이가 있었다. 요양병원관련 특성에서는

Table 2. Subjects' Death Anxiety, Social Support and PCEOL (N=155)

Variable	Mean±SD	Minimum	Maximum
Death anxiety			
Your own death	3.09 ± 0.54	1.00	5.00
Denial of the idea of death	2.77 ± 0.91	1.00	5.00
Short time lateness	3.26 ± 0.87	1.00	5.00
Fear of death-related events	3.28 ± 0.56	1.00	5.00
Total	3.15 ± 0.43	1.00	5.00
Social support			
Family support	3.17 ± 0.53	1.00	5.00
Medical personnel support	3.22 ± 0.57	1.00	5.00
Total	3.19 ± 0.45	1.00	5.00
PCEOL			
Autonomous physiological decision making	2.72 ± 0.46	1.00	5.00
Decision making by health care provider	2.92 ± 0.64	1.00	5.00
Family	3.19 ± 0.55	1.00	5.00
Spirituality	3.43 ± 0.72	1.00	5.00
Pain	3.67 ± 1.02	1.00	5.00
Total	3.11 ± 0.30	1.00	5.00

PCEOL=Preference for care near the end of life; SD=Standard deviation.

입원 전 동거 여부($t = 2.87, p = .005$)와 현 요양병원 입원기간($F = 6.84, p = .001$) 및 중환자실 입원 경험($t = 3.24, p = .002$)에 따라 임종치료선호도에 차이가 있었다. 건강관련 특성에서는 건강상태 지각($F = 4.26, p = .016$)과 일상생활능력($F = 3.16, p = .045$) 및 질병 중증도($F = 4.81, p = .003$)에 따라 임종치료선호도에 차이가 있었다.

사후 분석 결과, 월평균소득 '100만 원 미만'이 '100만 원 이상, 200만 원 미만'과 '200만 원 이상'보다 임종치료선호도가 높았고, 현 요양병원 입원기간 '24개월 이상'이 '6개월 이상, 12개월 미만'과 '12개월 이상, 24개월 미만'보다 임종치료선호도가 높았다. 건강관련 특성 중 건강상태 지각 '나쁨'이 '좋다'와 '보통'보다 임종치료선호도가 높았고, 일상생활능력 '전적인 도움'이 '완전자립'과 '약간 도움'보다 임종치료선호도를 명확히 표현하였으며, 질병중증도의 의료경도가 의료 중도와 문제행동, 인지장애, 신체 기능저하군 및 의료고도이상 그룹보다 임종치료선호도가 높았다.

4. 대상자의 죽음불안과 사회적 지지 및 임종치료선호도의 상관관계

대상자의 죽음불안과 사회적 지지 및 임종치료선호도의 상관관계는 Table 4와 같다. 임종치료선호도는 죽음불안($r = 0.32, p < .001$)과 사회적 지지($r = 0.30, p < .001$)와 유의한 상관관계가 있는 것으로 나타났다.

Table 3. Differences in PCEOL According to Subjects' Characteristics (N=155)

Characteristic	Category	PCEOL		
		Mean±SD	t or F	p (Scheffe)
General characteristics	Gender			
	Man	3.14±0.34	0.88	.380
	Woman	3.09±0.26		
	Age (year)			
	65~70	3.09±0.28	0.51	.679
	71~75	3.10±0.38		
	76~80	3.11±0.23		
	≥81	3.04±0.26		
	Education			
	Elementary school graduated	3.19±0.27	2.28	.082
	Middle school graduated	3.04±0.36		
	High school graduated	3.08±0.35		
	University graduated	3.06±0.21		
	Religion			
	Christian, catholicism	3.09±0.28	0.60	.610
	Buddhism	3.16±0.31		
	None	3.10±0.33		
	Others*	3.10±0.27		
LTC hospital characteristics	Monthly income (10,000 won)			
	<100 ^a	3.15±0.24	3.63	.029 (c<b<a)
	≥100~<200 ^b	3.14±0.31		
	≥201 ^c	2.99±0.37		
	Living together before hospitalization			
	Yes	3.07±0.31	2.87	.005
	No	3.21±0.27		
	Number of admission at LTC hospital			
	1	3.13±0.22	0.47	.625
	2	3.13±0.31		
	≥3	3.08±0.37		
	Duration of staying at LTC hospital (month)			
	6~<12 ^a	3.03±0.30	6.84	.001 (a<b<c)
	≥12~<24 ^b	3.09±0.35		
	≥24 ^c	3.23±0.17		
	Number of visits to LTC hospital			
	Once a week	3.42±0.21	0.97	.408
	Once every 2 weeks	3.22±0.39		
	Once a month	3.24±0.48		
	None	3.35±0.33		
Health characteristic	Intensive care transfer			
	Yes	3.21±0.18	3.24	.002
	No	3.08±0.33		
	Perception of health status			
	Poor ^a	3.15±0.27	4.26	.016 (b<c<a)
	Moderate ^b	2.99±0.36		
	Good ^c	3.14±0.23		
	Activities of daily living			
	Independent ^a	3.10±0.19	3.16	.045 (b<a<c)
	Dependent partially ^b	3.04±0.37		
	Dependent totally ^c	3.18±0.30		
	Severity of disease			
	High ^a	3.00±0.33	4.81	.003 (a<d<b<c)
	Medium ^b	3.17±0.21		
	Mild ^c	3.22±0.25		
	Selective hospitalization group ^{d†}	3.08±0.36		

*Shincheonji, Soka Gakkai International; †Behavior problem, impaired cognition, physical reduced; LTC=Long-term care; PCEOL=Preferences for care near the end of life; SD=Standard deviation.

5. 대상자의 임종치료선호도에 미치는 영향

임종치료선호도에 영향을 미치는 요인은 Table 5와 같다. 임종치료선호도의 영향요인을 파악하기 위하여 임종치료선호도를 종속변수로 하고, 대상자 특성에 따른 임종치료선호도 차이 검정에서 유의한 차이가 있었던 월평균소득, 입원 전 동거여부, 현 요양병원 입원기간, 중환자실 입원 경험, 건강상태 지각, 일상생활능력, 질병중증도의 7개 변수와 임종치료선호도와 유의한 상관관계가 있었던 죽음불안 및 사회적 지지 2개 변수를 포함하여 총 9개 변수를 독립변수로 투입하여 위계적 다중회귀분석을 실시하였다. 이들 중 월평균소득(기준: 100만 원 미만), 입원 전 동거 여부(기준: 무), 현 요양병원 입원기간(기준: 24개월 이상), 중환자실 입원 경험(기준: 유), 건강상태 지각(기준: 나쁨), 일상생활능력(기준: 전적인 도움), 질병중증도(기준: 의료 정도)는 범주형 변수로 가변수 처리하였다.

회귀분석의 가정을 검정한 결과, Durbin-Watson을 이용하여 검

정한 오차의 자기 상관은 1.80으로 검정 통계량보다 크기 때문에 자기 상관이 없는 것으로 나타났다. 다중공선성을 검정한 결과 tolerance (공차한계)가 0.1 이하이고 Variance Inflation Factor 값이 10보다 크지 않아 다중공선성의 문제가 없는 것으로 나타났다.

회귀모형은 통계적으로 유의하였고($F=5.93, p<.001$). 대상자의 월평균소득, 입원 전 동거 여부, 현 요양병원 입원기간, 중환자실 입원 경험, 건강상태 지각, 일상생활능력 및 질병중증도를 1단계를 투입한 결과(Model I) 요양병원 입원기간($\beta=.17, p=.050$), 중환자실 입원 경험($\beta=-0.21, p=.012$) 및 질병중증도($\beta=.16, p=.049$)의 3개 요인이 임종치료선호도에 유의한 영향을 미치는 것으로 나타났다. 2단계(Model II)에서 죽음불안을 투입한 결과 중환자실 입원 경험($\beta=-0.18, p=.021$) 및 질병중증도($\beta=.15, p=.050$), 죽음불안($\beta=.26, p=.001$)이 임종치료선호도에 유의한 영향을 미치는 것으로 나타났다. 3단계(Model III)에서 사회적 지지를 투입한 결과 중환자실 입원 경험($\beta=.18, p=.022$), 질병중증도($\beta=.16, p=.033$), 죽음불안($\beta=.23, p=.002$) 및 사회적 지지($\beta=.22, p=.003$)의 4개 요인이 임종치료선호도에 유의한 영향을 미치는 것으로 나타났다.

따라서 임종치료선호도에 영향을 미치는 요인은 죽음불안($\beta=.23, p=.002$), 사회적 지지($\beta=.22, p=.003$), 중환자실 입원 경험($\beta=.18, p=.022$), 질병중증도($\beta=.16, p=.033$) 순으로 나타났다. 모형의 설명력을 나타내는 수정된 결정계수(adjusted R^2)는 Model I에서 12%, Model II는 18%, Model III은 22.4%로 adjusted R^2 의 변화량은 유의하게 설명력이 증가하였다.

Table 4. Correlations Among Subjects' Death Anxiety, Social Support and PCEOL ($N=155$)

Variable	Death anxiety $r(p)$	Social support $r(p)$	PCEOL $r(p)$
Death anxiety	1		
Social support	.14	1	
PCEOL	.32**	.30**	1

Asterisk indicates a statistically significant (** $p<.001$). PCEOL=Preferences for care near the end of life.

Table 5. The Factors Affecting to the PCEOL ($N=155$)

Variable	Model I					Model II					Model III				
	B	SE	β	t	p	B	SE	β	t	p	B	SE	β	t	p
Monthly income*	-0.05	0.03	-.13	-1.55	.124	-0.03	0.03	-.08	-0.95	.345	0.03	0.03	.09	1.11	.268
Living together before hospitalization*	0.09	0.06	.14	1.63	.105	0.10	0.06	.15	1.74	.084	0.07	0.05	.10	1.22	.223
Duration of staying at LTC hospital*	0.06	0.03	.17	1.98	.050	0.06	0.03	.15	1.75	.083	0.05	0.03	.12	1.52	.131
Intensive care transfer*	-0.14	0.05	-.21	-2.54	.012	-0.12	0.05	-.18	-2.32	.021	0.12	0.05	.18	2.31	.022
Perception of health status*	0.01	0.02	.03	0.36	.720	0.00	0.02	.00	0.05	.958	0.00	0.04	-.01	-0.07	.947
Activities of daily living*	-0.01	0.02	-.03	-0.35	.730	-0.01	0.02	-.04	-0.48	.629	-0.01	0.02	-.02	-0.30	.761
Severity of disease*	0.04	0.02	.16	1.99	.049	0.04	0.02	.15	1.98	.050	0.04	0.02	.16	2.16	.033
Death anxiety						0.18	0.05	.26	3.43	.001	0.16	0.05	.23	3.12	.002
Social support											0.15	0.05	.22	3.02	.003
R^2			.160					.223					.269		
Adjusted R^2			.120					.180					.224		
F (p)			4.01 (<.001)					5.24 (<.001)					5.93 (<.001)		

*Dummy variables: Monthly income (<100=1, 100~200=0, ≥201=0); Living together before hospitalization (No=1, Yes=0); Duration of staying at LTC hospital ≥24=1, 6~<12=0, ≥12~<24=0; Intensive care transfer (Yes=1, No=0); Perception of health status (Poor=1, Moderate=0, Good=0); Activities of daily living (Dependent totally=1, Independent=0, Dependent partially=0); Severity of disease (Mild=1, High=0, Medium=0, Others=0); LTC=Long-term care, PCEOL=Preferences for care near the end of life; SE=Standard error.

논의

본 연구는 요양병원 노인의 죽음불안과 사회적 지지 및 임종치료 선호도의 정도를 파악하고 각 요인 간의 관계 및 임종치료선호도에 미치는 영향요인을 규명하기 위해 수행되었으며, 연구 결과 임종치료선호도에 영향을 미치는 주요 변수들에 대해 논의하고자 한다.

요양병원 노인의 임종치료선호도 정도는 총점 5점 중 평균 3.11점으로 나타났다. 이는 동일한 도구를 사용하여 임종치료선호도를 측정한 결과, 복지관 노인의 임종치료선호도가 3.26점[9], 시설노인의 임종치료선호도가 3.20점으로 나타난[23] 것과 비교하여 본 연구 대상자인 요양병원 노인의 임종치료선호도가 낮게 나타났다. 임종치료선호도 정도를 확인한 연구가 소수에 불과하여 그 정도를 대상자별로 비교하기는 어렵고 그 결과를 일반화하기는 어렵다. 하지만 요양병원 노인의 경우 임종치료를 노출되는 경험이 많고 임종치료를 대해 의료인과 협의해야 할 사항이 있을 수 있음에도 불구하고, 임종치료선호도 점수가 낮게 나타난 원인을 파악하고, 요양병원 노인의 임종치료선호도 특성을 분석할 필요가 있다.

한편, 본 연구 대상자의 임종치료선호도 하위영역을 살펴보면 통증이 가장 높게 나타났고, 이는 재가 및 시설 노인뿐만 아니라 성인을 대상으로 임종치료선호도를 측정한 연구에서도 통증이 가장 높게 나타난 결과와 유사하다[2,23]. 통증은 임종 중에 95%의 환자가 경험하는 일반적인 증상으로 환자는 지속적인 통증을 겪는 것보다 차라리 임종을 원한다고 보고될 정도로[24] 통증 상태를 피하고자 한다. 본 연구에서도 임종치료선호도 통증영역의 질문 중 ‘나는 혹시 임종이 당겨지는 한이 있더라도 통증이 없기를 원한다.’, ‘나는 고통받기보다는 일찍 죽음을 맞기 원한다.’에서 높은 점수가 나타나 임종의 상황에서 통증이 없고 통증보다는 임종을 마감하기를 원하는 점에서 선행연구의 결과와 유사하다. 따라서 의료인은 대상자의 무통에 대한 요구를 이해하고 임종환자의 통증관리 역량을 적절하게 구비해야 할 것이며, 특히 임종상황에서 환자가 원하는 통증에 대한 요구와 선호 경향을 면밀히 파악하여 중재할 것을 제안한다.

본 연구에서 요양병원 노인의 죽음불안이 임종치료선호도에 가장 크게 영향을 미치는 것으로 나타났고, 이는 일반 성인과 노인을 대상으로 수행한 선행연구에서도 죽음불안이 임종치료선호도에 가장 큰 영향을 미친다는 결과와 유사하다[9]. 죽음불안은 죽음으로부터 오는 공포에서 벗어나길 희망하는 적극적 방어 개념으로[12], 죽음불안의 하위영역 중 ‘죽음 연관사건에 대한 두려움’이 높게 나타났다. 요양병원 노인은 요양병원에 거주하면서 연 평균적으로 매주 다른 노인의 죽음에 노출되고[10], 이로 인해 발생하는 죽음불안이 임종과 죽음에 대해 공포, 혐오감 및 부정과 같은 다양한 감정을 초래하고 임종치료선호도를 적극적으로 표명함으로써 임종치료 수행도를 높이는 것으로 사료된다. 이러한 결과를 바탕으로 의료인은 요양병원 노인을 대상으로 죽음불안 감소를 위해 죽음 준비교육을 노년 초기

에 제공함으로써 남은 생애를 긍정적으로 재평가하고 재정립하도록 돕는 것이 요구된다[9], 또한 요양병원 내 의료인은 요양병원 거주 연도가 높고 중증질환으로 죽음에 임박하여 그 불안이 높은 환자를 대상으로 임종치료선호도를 항목별로 분석하는 등의 체계적인 조사 및 관리를 해야 할 것을 제안한다.

본 연구에서 요양병원 노인의 사회적 지지가 임종치료선호도의 영향요인으로 나타났고, 이는 두 변수 간의 관계를 확인한 선행연구가 부재하여 직접 비교하기는 어려우나 요양병원 환경의 특성을 고려하여 지속적인 사회적 지지가 제공되는 것이 중요함을 시사한다. 그러나 요양병원 노인은 질병관련 지식이 부족하고 가족으로부터 장기간 분리되어 의료인에게 의존적이므로[4], 가족과 의료인으로부터의 복합적인 지지가 필요한 상태이다. Kim와 Lee [16]의 연구에서 재가 노인의 사회적 지지가 5점 만점에 4.05점인 반면에, 본 연구의 요양병원 노인의 사회적 지지는 5점 만점에 3.19점으로 요양병원 노인의 사회적 지지가 상대적으로 낮게 보고되고 있으므로, 요양병원 노인의 사회적 지지를 강화할 필요가 있다. 요양병원 노인이 자신의 임종치료를 대해 스스로 의사결정하는 것뿐만 아니라 가족 및 의료인과의 지지를 통해 지속적으로 자신의 임종치료선호도에 대해 의논할 수 있도록 의료인은 이러한 병원환경을 조성하여 노인의 삶의 질을 높게 유지할 수 있는 전략을 세우는 것이 요구된다.

본 연구 결과 요양병원 노인의 이전 중환자실 입원 경험이 임종치료선호도에 영향을 미치는 것으로 나타났고, 이는 만성질환자 노인을 대상으로 수행한 연구에서 중환자실 입원 경험이 임종치료선호도에 영향을 미친 것으로 나타난 연구 결과와 유사하다[25]. 중환자실 입원은 연명의료, 심폐소생술, 죽음 등을 간접적으로 경험하게 하고 이러한 경험이 요양병원에 거주하는 노인의 임종과 죽음을 다시 생각하는 계기가 되어[26], 임종치료선호도에 영향을 미친 것으로 사료된다. 요양병원 내 중환자가 발생하면 해당 병원 내에서 전실을 하기도 하나 대학병원이나 종합병원으로 전원을 가는 경향이 높다[27]. 이에 요양병원 노인이 중환자실 이용을 위해 전원을 가기 전에 본인의 임종치료선호도를 명확하게 가족 및 의료인과 의논하여 결정할 수 있도록 지지하고, 중환자실 입원의 경우에도 필요시 임종치료를 대한 자율적 의사결정을 독려하는 등의 중재가 요구된다.

요양병원 노인의 질병중증도가 낮을수록 임종치료선호도에 영향을 미치는 것으로 나타났고, 이는 두 변수 간의 관계를 확인한 선행연구가 부재하여 직접 비교는 어려우나 요양병원 노인은 중증질환을 가진 경우 사망과 질병에 대한 부담이 급증하면서 임종치료선호도를 명확히 표현하지 않게 된다고 보고한 선행연구와 유사하다[22]. 본 연구에서 요양병원 노인은 의료 정도에 해당하는 경우가 많아 적극적인 치료와 생명연장에 관심이 있고 이러한 질병상태가 임종치료선호도에 영향을 미친 것으로 사료된다. 따라서 노인이 요양병원을 초기에 방문하는 질병중증도가 낮은 시기부터 임종치료선호도에 대한 적극적인 홍보를 통해 자신의 임종치료 수준을 결정할

수 있도록 지지할 것을 제안하고, 요양병원 노인의 질병중증도 차이에 따라 임종치료선호도의 수준을 확인하여 대상자별 그 선호도를 관리하는 중재가 요구된다.

결론적으로 본 연구는 요양병원 노인의 죽음불안, 사회적 지지가 임종치료선호도에 미치는 영향을 확인하였고, 요양병원 노인의 임종치료선호도를 명확히 파악하고 향상시키는 방안을 마련하는 데 필요한 기초자료를 제공한다는 점에서 의의가 있다. 또한 요양병원 노인은 임종기에 의료진이 임종치료선호도와 사전의사결정을 고려하여 치료해 줄 것이라 믿는 긍정적인 태도를 가지고 있으므로[4]. 요양병원 노인이 가족 및 의료진과 함께 의사소통하여 임종치료선호도를 포함한 사전연명의료의향서에 대한 결정을 할 수 있도록 지지할 필요가 있다. 본 연구 결과를 바탕으로 의료인은 요양병원 노인과 임종치료선호도에 관해 주기적인 의사소통이 필요함을 인식하고 이들이 자기결정을 통해 명확한 임종치료선호도를 작성하도록 지지해야 한다.

본 연구의 제한점 및 제안점은 다음과 같다. 첫째, 본 연구에서 사용한 임종치료선호도 측정도구가 선행연구에서 타당도와 신뢰도 검증된 도구나 본 연구에서 Cronbach's α 값이 .48, ~.81로 그 범위가 광범위하여 향후 사용 시 제한점을 개선하여 사용할 것을 제안한다. 둘째, 본 연구 대상자는 1개 지역 2개 요양병원에 입원하고 있는 노인을 대상으로 수행한 연구로 그 결과를 일반화하는 데에는 한계가 있으므로, 향후 지역과 요양병원 수준을 다양화하고 요양병원 노인의 질병 특성을 구체화하여 연구를 수행할 것을 제안한다. 마지막으로 요양병원 노인의 임종치료선호도 영향요인을 확인하기 위해 죽음불안과 사회적 지지 이외에도 요양병원 특성과 가족의 특성을 포함하여 포괄적으로 영향요인을 확인할 것을 제안한다.

결론 및 제언

본 연구는 155명의 요양병원 노인을 대상으로 죽음불안, 사회적 지지가 임종치료선호도에 미치는 영향을 확인하기 위한 서술적 조사 연구이다. 요양병원 노인의 죽음불안, 사회적 지지, 중환자실 입원 경험, 질병중증도가 통계적으로 유의한 영향요인으로 나타났다. 본 연구 결과를 바탕으로 의료인은 요양병원 노인이 죽음불안을 표현할 때 임종치료선호도를 구체적으로 파악하여 환자의 특성에 적합한 임종치료를 제공하는 것이 중요하다. 요양병원에 거주하는 노인이 가족, 동료 환자, 의료인 등으로부터 폭넓은 범위와 지속적 지지를 받음으로써 임종치료선호도를 적합한 시기에 표현하고 스스로 결정할 수 있도록 시스템을 마련하고 전략을 수립해야 한다. 요양병원 노인의 중환자실 입원 경험이나 질병중증도 수준에 따라 이들이 필요로 하는 임종치료선호도를 미리 파악하고 중재하는 노력이 요구된다.

이러한 연구결과는 향후 요양병원 노인을 대상으로 죽음에 대해 올바르게 수용하고 긍정적이고 의미 있는 삶을 영위하며 자신의 가

치관에 맞게 임종치료선호도를 작성하는 데 기여할 수 있을 것이다. 본 연구의 결과를 바탕으로 요양병원 노인을 대상으로 임종치료선호도의 요인을 파악하고 그에 따른 임종치료선호도를 반영한 프로그램을 개발 및 적용하여 효과를 검증하는 것이 필요하다. 또한 건강한 노인과 구별되는 요양병원 노인의 임종치료선호도 특성을 비교하여 각 노인의 특성에 적합한 간호중재 개발 및 적용을 제언한다.

ORCID

Ji Hun Joung, <https://orcid.org/0009-0000-9507-5870>

Heeok Park, <https://orcid.org/0000-0002-8194-0373>

Authors' contribution

Study conception and design acquisition - JHJ and HP; Data collection - JHJ; Analysis and interpretation of the data - JHJ and HP; Drafting - JHJ and HP; Critical revision of the manuscript - JHJ and HP; Final approval - JHJ and HP

Conflict of interest

Heeok Park has been a member of editorial committee of the Journal of Korean Gerontological Nursing since 2017. She is not involved in the review process of this manuscript. Otherwise, there was no conflict of interest.

Funding

None.

Data availability

Please contact the corresponding author for data availability.

Acknowledgements

This article is a revised version of the first author's thesis.

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심장수술 후 노인 환자의 중환자실에서의 섬망 발생률 및 위험요인: 후향적 조사연구

류정옥¹, 홍(손)귀령²

¹서울아산병원 전문 간호사, ²한양대학교 간호대학 교수

Prevalence and risk factors of delirium of older adults after cardiac surgery at the intensive care unit: A retrospective study

Jeong-Ok Ryu¹, Gwi-Ryung Son Hong²

¹Advanced Practice Nurse, Department of Nursing, Asan Medical Center, Seoul, Korea

²Professor, College of Nursing, Hanyang University, Seoul, Korea

Received: October 25, 2023

Revised: February 6, 2024

Accepted: February 18, 2024

Corresponding author:

Gwi-Ryung Son Hong
College of Nursing, Hanyang
University, 222 Wangsimni-ro,
Seongdong-gu, Seoul 04763, Korea
TEL: +82-2-2220-0701
E-mail: grson@hanyang.ac.kr

Purpose: The purpose of this study is to identify the prevalence and risk factors of delirium of older adults after cardiac surgery at the intensive care unit (ICU). **Methods:** A retrospective descriptive correlational study design was used. Among 675 older adults who admitted to ICU after cardiac surgery in a tertiary hospital from May 2021 to April 2022, 528 were selected for data analysis. Data were collected through electronic medical records. Delirium and pain intensity were evaluated using the Confusion Assessment Method-Intensive Care Unit and Critical Care Non-verbal Pain Scale, respectively. **Results:** The incidence rate of delirium was 41.3% (n=218). Multivariate logistic regression analysis of the variables identified that ICU length of stay (odds ratio [OR]=1.77, $p<.001$), anesthesia time (OR=1.21, $p=.016$), pain intensity (OR=1.14, $p=.044$), and age (OR=1.07, $p=.002$) were identified as risk factors of delirium after cardiac surgery. **Conclusion:** ICU length of stay, anesthesia time, pain score, and advanced age should be considered as the prevention and management of delirium at the intensive care unit of older adults after cardiac surgery.

Keywords: Delirium; Risk factors; Aged; Cardiac surgical procedures; Intensive care unit

서론

1. 연구의 필요성

수술과 마취 기술의 발달로 인하여 노인 환자에게도 수술을 권유하는 경우가 많아지면서 수술을 시행 받는 노인 환자 수가 증가하고 있다. 2022년 국민건강보험공단에서 발표한 주요 수술 통계 연보에 의하면 33개 주요 수술에서 65세 이상 노인이 차지하는 비율이 2011년 31.2%에서 2021년 41.4%로 급격하게 증가하고 있는 추세

이다[1]. 경제협력개발기구(Organization for Economic Co-operation and Development)가 언급하는 주요 수술은 백내장 수술, 편도절제술, 관상동맥우회수술 등 15개 수술과 환자의 의료비 부담이 크거나 최근 수술인원이 많이 증가하고 있는 치핵수술, 일반척추수술, 뇌종양수술, 위절제술 등 18개 수술을 말한다. 심장수술에서도 65세 이상 노인이 차지하는 비율이 2011년 40.7%에서 2021년 48.2%로 증가하였다[1].

노인은 수술 후에 통증, 섬망, 인지장애, 심장 및 폐 합병증, 출혈, 요로감염 등의 합병증이 발생하기 쉽기 때문에 더 높은 수준의 관리

가 필요하다[2]. 수술 후 섬망은 수술 첫 주 동안 또는 퇴원할 때까지 인지, 주의력, 의식의 일시적인 변동으로 정의되는 증후군으로 수술 후 노인 환자의 최대 50%에서 발생하는 매우 흔하고 심각한 합병증이다[3]. 노인 수술 환자의 수술 후 섬망과 부작용의 연관성에 대한 체계적 문헌고찰과 메타분석[3]에 의하면 섬망이 있는 노인 환자는 사망률, 수술 후 합병증(심폐합병증, 신경학적 합병증, 요 정체, 수면 장애, 영양문제, 감염, 욕창, 낙상 등), 계획되지 않은 중환자실 입실, 병원 재원기간의 연장, 집 이외의 장기요양시설로 퇴원의 위험이 증가하였고 이는 의료비용의 상승을 초래하였다.

수술 후 섬망의 발생기전은 완전히 밝혀지지 않았지만 신경염증, 신경전달물질의 변화로 알려져 있다[4]. 심폐우회로를 사용하면 내피기능 장애 및 혈액-뇌 장벽 파괴로 인해 전신 염증이 발생하게 되고 미세 색전증의 위험을 증가시켜 다른 수술에 비해 심장수술 후에 섬망의 발생률이 높게 나타나고 있다[5]. 또한 심장수술 후에는 전신 마취 상태로 중환자실로 입실하고 있고 혈액학적 상태가 안정이 된 후에 의식회복과 기관 내관 발관을 시도하고 있다. 따라서 중환자실에서 의식이 깨어나게 되어 익숙하지 않은 주변 환경과 불안정한 혈액학적 상태, 기관 삽관, 다양한 약물 사용 등으로 인해 섬망 발생에 취약할 수 있다[6].

수술 기술과 여러 가지 노력에도 불구하고 심장수술 후 섬망의 발생은 4.1%~54.9%로 다양하게 나타나고 있다[7]. 심장수술 후 섬망은 수술 후 3.35 ± 4.05 일에 발생했으며 5.97 ± 5.36 일 동안 지속되었다[8]. 수술 후 섬망의 발생은 환자의 예후에 부정적인 영향을 미치지만, 최대 40%가 예방 가능하고[3], 조기에 발견되면 빠른 시일 내에 회복될 수 있는 증후군이다. 따라서 섬망 발생 관련 위험요인을 파악하여 예방하고 조기 진단 및 중재로 부정적인 결과를 최소화하는 것이 중요하다[9]. 특히 65세 이상 노인들은 젊은 사람들에 비해 섬망을 임상적으로 인지하기 어려워 놓치기 쉽고 우울증이나 치매로 잘못 진단되기도 하는 저활동형 섬망 발생이 유의하게 높게 나타나는 경향이 있어 더욱 더 주의 깊게 살펴야 할 필요가 있다[10].

심장수술 후 섬망 발생의 위험요인에 대한 체계적 문헌고찰, 메타분석, 예측 모델을 포함한 많은 연구들이 보고되고 있다[5-8, 11-16]. 선행연구를 살펴보면 심장수술 후 섬망 발생의 위험요인은 수술 전, 수술 중, 수술 후 요인으로 나눌 수 있다. 수술 전 요인은 나이[5, 7, 8, 11-13], 성별[5], 교육수준[5, 13], 인지장애[7, 11], 동반질환(당뇨병, 뇌졸중, 심방세동, 만성 폐쇄성 폐질환, 불면증 등)[5, 7, 11, 13, 14], 체질량 지수(body mass index, BMI) [13], 우울[5], 알코올 및 약물 남용[14], 흡연[14]이, 수술 중 요인은 혈액 손실 정도[5], 수술명[5, 6, 13], 마취 약물[5], 심폐우회술 시간[5, 13], 그리고 수술 후 요인은 혈액학적 수치 albumin, creatinine, C-reactive protein (CRP) [5, 6, 12], 기계 환기시간[5, 7, 12, 15], 중환자실 재실 기간[6, 15, 16], 억제제 사용[5] 등이 유의하게 보고되었다. 심장수술 후 섬망 발생의 위험요인으로 유의하지는 않았지만 수술 후 통

증[6, 17], 미국 마취과 학회 신체 상태(American Society of Anesthesiologists Physical Status, ASAPS) 등급[8], 급성 생리학 및 만성 건강 평가(Acute Physiology And Chronic Health Evaluation II, APACHE II) 점수[10], 수술시간[14], 마취제[14], 진통제 종류[17]는 섬망 발생과 관련된 변수로 언급되었다.

심장수술을 받은 노인 환자를 대상으로 섬망 발생률과 위험요인에 대한 국외 문헌에 따르면 섬망 발생률이 25.6% [14]와 50% [16]로 나타났다. 흡연, 음주, 동반질환(만성 폐쇄성 폐질환, 심방세동), 기관 삽관시간, 발관 후 심박 수, 발관 후 저산소증은 심장수술 후 노인 환자의 섬망 발생과 관련이 있었지만 수술명, 마취제 종류, 수혈은 관련이 없었다[14]. 또한 심장수술 후 섬망의 발생은 노인 환자의 중환자실 재실 기간과 병원 재원기간의 독립적인 위험인자로 보고되었다[16].

이와 같이 국내외 많은 연구에서 심장수술 후 섬망 발생의 위험요인은 다양하게 나타나고 있으나 섬망의 발생기전이 아직 명확하지 않고 대상자의 특성에 따라 섬망 발생 관련 위험요인은 다를 수 있어 지속적인 연구가 필요하다. 국내에서도 섬망 발생률 및 위험요인에 대한 많은 연구[4, 6, 9, 18]들이 보고되고 있지만 심장수술 환자를 대상으로 하는 연구[6]는 몇 편 없으며 특히 섬망에 취약한 노인만을 대상으로 한 연구는 거의 없는 실정이다. 따라서 심장수술 후 중환자실에 입실한 노인 환자의 섬망 발생률을 확인하고 섬망 발생 관련 주요 위험요인을 파악함으로써 섬망을 조기 발견하고 섬망 발생을 예방하기 위한 맞춤형 간호중재에 대한 기초 자료를 제공하고자 한다.

2. 연구목적

심장수술 후 노인 환자의 중환자실에서의 섬망 발생률 및 위험요인을 파악함으로써 수술 후 섬망을 조기 발견하고 섬망 발생 예방 간호중재 프로그램을 개발하기 위한 기초 자료를 제공하기 위함이며 구체적 목적은 다음과 같다.

- 심장수술 후 노인 환자의 중환자실에서의 섬망 발생률과 섬망 양상을 확인한다.
- 섬망 발생군과 비발생군의 일반적 특성 및 임상적 특성을 비교한다.
- 섬망 발생 관련 위험요인을 확인한다.

연구방법

Ethic statement: This study was approved by the Institutional Review Board (IRB) of Asan Medical Center (IRB No. 2022-1662). Obtaining informed consent was exempted by the IRB because this study was secondary data analysis of existing data.

1. 연구설계

2021년 5월 1일부터 2022년 4월 30일까지 전신 마취를 통해 심장수술을 받고 중환자실로 입실한 노인 환자의 섬망 발생률 및 위험요인을 파악하기 위한 후향적 조사연구이며, 본 연구는 Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) 보고 지침(<http://www.strobe-statement.org>)에 따라 기술하였다.

2. 연구대상

심장수술 후 중환자실로 입실한 노인 환자의 섬망 발생률 및 위험요인을 파악하기 위해서 중환자실 내 성인 심장수술 환자의 섬망 발생률 및 위험요인을 후향적으로 조사한 선행연구[6]의 연구기간이 1년임을 참고하여 2021년 5월 1일부터 2022년 4월 30일까지 1년 동안의 의무기록을 확인하였다.

본 연구의 선정기준은 기간 내에 심장수술을 위해 입원하여 전신 마취를 통해 수술을 받고 중환자실로 입실했던 환자, 65세 이상 환자, 중환자실 혼돈 사정 방법(Confusion Assessment Method-Intensive Care Unit, CAM-ICU)으로 섬망을 사정하여 섬망 발생 유무가 기록되어 있는 자, 수술 후 24시간 이내에 의식이 회복되어 의사소통이 가능하여 통증 사정 기록이 되어 있는 자로 하였다. 제외기준은 중환자실 입실 후 24시간 이내 사망한 자, 의무기록 자료가 누락된 자였다. 1년 동안 서울 소재 A 상급종합병원에 심장수술을 위해 입원하여 전신 마취를 통해 수술을 받고 수술 후 중환자실로 입실한 노인 환자 약 675명 중 선정기준에 부합하지 않은 147명을 제외한 528명을 대상으로 하였다.

3. 연구도구

1) 섬망 발생 및 아형

섬망은 CAM-ICU [19]로 사정하여 의무기록에 기록된 섬망 양성, 음성 여부를 조사하였다. CAM-ICU는 중환자의 섬망을 평가하기 위해 개발된 도구로 2단계로 평가한다. 1단계는 리치몬드 흥분 진정 척도(Richmond Agitation Sedation Scale, RASS)를 이용하여 환자의 진정상태를 평가한다. -5점(무의식)에서 +4점(공격적)까지 10점 척도로 구성되어 있다. -4, -5점이면 깊은 진정상태로 언어 자극에 전혀 반응할 수 없는 상태이므로 섬망 사정을 중지하고, -3점 이상인 경우 2단계로 넘어가게 된다. 2단계는 섬망의 4가지 특성(정신상태의 변동, 주의력 결핍, 비체계적 사고, 의식수준의 변화)별로 주어진 상황이나 질문에 대하여 적절하게 답하거나 따르는지 확인하여 양성여부를 평가한다. 개발 당시 CAM-ICU 도구의 민감도는 95%~100%, 특이도는 89%~93%였으며[20], 한글판 도구의 민감도

는 89.9%, 특이도는 77.4%였다[19].

A 상급종합병원에서는 섬망 사정도구를 이용하여 섬망에 대해 정기적으로 평가해야 한다는 중환자임상진료지침[21]의 권고에 따라 중환자실에 입실한 모든 환자는 매 근무조마다 CAM-ICU로 섬망 발생 유무를 사정하고 있다. 본 연구는 의무기록을 확인하여 중환자실에 입실하여 퇴실할 때까지 CAM-ICU로 측정된 결과 1회 이상 양성으로 평가된 경우 섬망군으로 하고 섬망 발생 시작일과 기간을 조사하였다. 섬망의 아형은 RASS 점수를 바탕으로 -3~0점이면 저활동형 섬망, +1~+4점이면 과활동형 섬망, 같은 날 과활동형과 저활동형의 특징을 모두 보인 경우 혼합형 섬망으로 구분하였다[22].

2) 대상자의 일반적 특성 및 임상적 특성

본 연구에서 심장수술 후 섬망 발생 관련 위험요인을 확인하기 위해 조사한 대상자의 일반적 특성 및 임상적 특성은 다음과 같다. 심장수술 후 섬망 발생 관련 위험요인에 대한 국내 후향적 조사연구[6], 국외 종합 검토[5], 메타분석[7,15], 조사연구[8,12-14,16], 예측 모델[11], 체계적 문헌고찰[15]에서 유의하게 나온 변수인 나이, 성별, 교육수준, BMI, 동반질환, 수술명, 심폐우회술 시간, 중환자실 재실 기간, 병원 재원기간, 혈액학적 수치(albumin, creatinine, CRP), 억제대 적용기간, 기관 삽관기간 외에도 수술 후 섬망 발생 관련 위험요인[2,4,9,10,11,17,21]으로 언급된 변수들 중 후향적으로 조사 가능한 변수인 시각 및 청각 장애유무, ASAPS 등급, 마취 시간, APACHEII 점수, 수술 후 통증 강도, 진통제 사용(자가 통증 조절기 사용기간), 카테터 수를 추가로 조사하였다.

(1) 일반적 특성

대상자의 일반적 특성은 나이, 성별, 교육수준, BMI를 조사하였다. 나이, 성별, 교육수준은 입원 당시의 간호정보조사지, BMI는 수술 당일 마취 기록지를 통해 확인하였다.

(2) 임상적 특성

대상자의 임상적 특성은 동반질환(당뇨, 고혈압) 유무, 시각 및 청각장애 유무, 수술명, ASAPS 등급, 마취시간, 심폐우회술 유무 및 시간, APACHEII 점수, 중환자실 재실 기간, 병원 재원기간, 혈액학적 수치(albumin, creatinine, CRP), 수술 후 통증 강도, 억제대 적용기간, 기관 삽관기간, 자가 통증조절기 사용기간, 카테터 수를 조사하였다.

동반질환(당뇨, 고혈압) 유무, 시각 및 청각 장애 유무는 수술을 위해 입원한 당시의 간호정보조사지를 통해 확인하였다. 수술명은 수술 기록지, ASAPS 등급과 마취시간은 마취 기록지, 심폐우회술 유무 및 시간은 체외순환 기록지를 통해 확인하였다. 마취시간과 심폐우회술 시간은 시작에서 종료까지의 시간을 조사하였다. APACHEII 점수는 중환자실에 입실한 뒤 24시간 이내에 나이, Glasgow Coma

Scale, 혈액학적 및 생리학적 지표 등을 이용하여 질병의 중증도를 평가하고 환자의 예후를 예측하기 위해 임상에서 사용하는 척도로 (0~71점) 점수가 높을수록 중증도가 높고 사망 위험이 높음을 의미한다[23]. 본 연구에서는 심장수술을 하고 중환자실 입실 후 24시간 이내에 작성된 값을 조사하였다. 중환자실 재실 기간과 병원 재원 기간은 중환자실과 병원 입원일부터 퇴실일까지 기간을 일로 계산하여 조사하였다. 혈액학적 수치(albumin, creatinine, CRP)는 중환자실 입실 후 처음 측정된 결과를 조사하였다.

수술 후 통증 강도는 통합통증기록지에 기록된 통증 사정 기록을 조사하였다. A 상급종합병원의 심장수술 후 중환자실로 입실한 환자는 의식이 회복되어 주관적으로 통증을 표현할 수 있을 때까지는 중환자 통증 사정도구(Critical Care Non-verbal Pain Scale, CNPS)로, 의식이 회복되고 난 후에는 숫자등급척도(Numerical Rating Scale, NRS)로 근무조마다 통증을 사정하고 있었다. 심장수술 후 통증은 처음 24시간 동안 가장 심하고 그 이후에는 감소한다[24]는 연구에 따라 본 연구에서는 수술 후 24시간 동안 CNPS와 NRS로 사정된 통증 강도를 확인하고 각각 가장 높게 측정된 점수를 조사하였다.

CNPS는 주관적인 통증 사정이 어려운 기계호흡 환자와 진정제를 투여 받고 있는 무의식 환자 등 구두 의사소통이 불가능한 중환자를 대상으로 2012년 국내에서 개발된 통증 사정도구이다[25]. 구성이 간단하나 환자의 다양한 상태를 반영하는 3개 항목이 포함되어 있어 객관적인 통증 측정이 가능하며 측정이 간편하고 각 문항의 표현이 구체적이고 이해하기 쉬운 용어로 구성되어 있어 간호사들이 쉽게 사용할 수 있다[25]. 얼굴표정, 신체반응, 기계 호흡 순음 또는 언어반응으로 구성되어 있으며 각 문항은 4점 척도로서 통증 행동이 전혀 없는 경우는 0점, 가장 극심한 통증 행동은 3점으로 0점부터 9점까지 측정된다[25]. 1분 이상 관찰 후 가장 높은 통증 점수를 측정하고 측정된 점수가 클수록 통증 정도가 심해지는 것을 나타내며 3점을 통증 관리가 필요한 시점으로 제시하고 있다[26].

억제대 적용기간은 억제대 적용에서 제거 시까지의 기간, 기관 삽관기간은 수술 후 중환자실 입실부터 자발호흡이 가능하여 기관 삽관 튜브를 제거한 시기까지의 기간, 자가 통증조절기 사용기간은 자가 통증조절기 적용을 시작한 날부터 제거한 날까지의 기간을 각각 일로 계산하여 조사하였다. 카테터 수는 수술 후 중환자실 입실 시의 개수를 조사하였다.

4. 자료 수집

자료 수집은 임상연구심의위원회(Institutional Review Board, IRB)와 간호부 승인을 받은 후 진행하였다. 전자의무기록 열람에 대해 간호부와 마취통증의학과와 허락을 받은 후 의무기록팀으로부터 전자의무기록 열람을 승인 받고 자료를 수집하였다. 2023년 4월 1일부터 7월 31일까지 자료 수집을 시행하였으며 연구 자료에 대해

데이터 융합팀에 연구정보서비스를 의뢰하여 관련 데이터를 파일로 받고 부족한 자료는 연구자가 직접 전자의무기록을 확인하였다.

5. 자료 분석

수집된 자료는 SPSS/WIN 27.0 통계 프로그램(IBM Corp.)을 이용하여 분석하였으며 구체적인 방법은 다음과 같다. 섬망 발생률과 양상, 일반적 특성 및 임상적 특성은 빈도, 백분율, 평균과 표준편차의 기술통계방법을 사용하여 분석하였다. 일반적 특성, 임상적 특성에 따른 섬망 발생 유무는 연속형 변수는 independent t-test, 범주형 변수는 χ^2 test, Fisher's exact test를 이용하여 분석하였다. 섬망 발생 관련 위험요인을 확인하기 위하여 단변량 로지스틱 회귀분석(univariate logistic regression)에서 유의한 차이를 보인 변수만을 포함시켜 다중 로지스틱 회귀분석(multivariate logistic regression)을 이용하여 분석하였다.

6. 윤리적 고려

본 연구는 서울시 소재의 서울아산병원 IRB의 승인(IRB No. 2022-1662)을 받았다. 해당 IRB에서 전자의무기록을 이용한 후향적 연구로 피험자 사전 동의를 면제받았으나 수집된 대상자의 개인정보에 대한 비밀보호를 위해 모든 자료는 연구자 이외에는 인식할 수 없도록 식별 코드화하여 조사지에 기록하였으며 연구목적 이외에 용도로 사용하지 않았다. 또한 자료 파일에 암호를 설정하여 타인의 접근을 제한하였다.

연구결과

1. 심장수술 후 노인 환자의 중환자실에서의 섬망 발생률과 섬망 양상

심장수술 후 노인 환자의 중환자실에서의 섬망 발생률과 섬망 양상은 Table 1과 같다. 전체 대상자 528명 중 섬망 발생률은 218명(41.3%)이었다. 섬망 발생 시기는 수술 당일 82명(37.6%), 수술 후 1일째에 115명(52.8%), 수술 후 2일 이상에 21명(9.6%)이었다. 섬망 발생 기간은 1일 이내 135명(61.9%), 2일 이내 39명(17.9%), 3일 이내 19명(8.7%), 3일 초과 25명(11.5%)이었다. 섬망 양상은 저활동형 섬망이 149명(68.3%), 혼합형 섬망이 42명(19.3%), 과활동형 섬망이 27명(12.4%)이었다.

2. 섬망군과 비섬망군의 일반적 특성에 따른 비교

섬망군과 비섬망군의 일반적 특성을 비교한 결과는 Table 2와 같

다. 섬망군과 비섬망군의 일반적 특성을 비교한 결과 나이와 교육수준에서 유의한 차이가 있었다. 대상자의 평균 나이는 71.2 ± 5.0 세였고 섬망군에서는 72.3 ± 5.1 세, 비섬망군에서는 70.4 ± 4.8 세로 섬망군에서 통계적으로 유의하게 많았다($t = -4.29, p < .001$). 교육수준에 따라 통계적으로 유의한 차이가 있었으며 초졸 이하와 고졸일 때 섬망군의 비율이 높았다($\chi^2 = 7.91, p = .048$). 성별과 BMI는 통계적으로 유의한 차이가 없었다.

3. 섬망군과 비섬망군의 임상적 특성에 따른 비교

섬망군과 비섬망군의 임상적 특성을 비교한 결과는 Table 3과 같다. 섬망군과 비섬망군의 임상적 특성을 비교한 결과 청각장애 유무, 수술 종류, 마취시간, 심폐우회술 시간, APACHEII 점수, 중환자실 재실 기간, 병원 재원기간, 통증 사정도구 CNPS로 측정한 통증 강

도, 기관 삽관기간, 자가 통증조절기 사용기간, 카테터 수에서 유의한 차이를 보였다.

청각장애가 있는 경우는 섬망군에서 34명(15.6%)으로 더 많았고($\chi^2 = 51.68, p < .001$), 수술 종류는 관상동맥치환술, 대동맥류 수술, 복합수술은 섬망군이 많았고 판막치환술, 기타 수술은 비섬망군이 더 많았다($\chi^2 = 11.18, p = .025$). 섬망군이 마취시간($t = -4.49, p < .001$), 심폐우회술 시간($t = -2.81, p = .005$), 중환자실 재실 기간($t = -3.68, p < .001$), 병원 재원기간($t = -3.25, p = .001$), 기관 삽관기간($t = -3.18, p = .002$), 자가 통증조절기 사용기간($t = -2.55, p = .011$)이 더 길었고 APACHEII 점수($t = -2.09, p = .037$), 통증 사정도구 CNPS로 측정한 통증 강도($t = -1.97, p = .049$)가 더 높았으며 카테터 수($t = -4.71, p < .001$)도 더 많았다. 하지만 당뇨병, 고혈압, 시각장애 유무, 심폐우회술 유무, ASAPS 등급, albumin, creatinine, CRP, 통증 사정도구 NRS로 측정한 통증 강도, 억제대 적용기간은 통계적으로 유의한 차이가 없었다.

4. 섬망 발생 관련 위험요인

심장수술 후 노인 환자의 중환자실에서의 섬망 발생 위험요인을 분석하기 위해서 단변량 로지스틱 회귀분석에서 통계적으로 유의하게 도출된 변수를 다변량 로지스틱 회귀분석에 투입한 결과는 Table 4와 같다. 단변량 로지스틱 회귀분석에서 유의하게 나온 변수는 나이, 마취시간, APACHEII 점수, 중환자실 재실 기간, 병원 재원기간, 통증 사정도구 CNPS로 측정한 통증 강도, 기간 삽관기간, 자가 통증조절기 사용기간, 카테터 수였다. 유의하게 나온 변수로 다변량 로지스틱 회귀분석을 한 결과 심장수술 후 노인 환자의 중환자실에서의 섬망 발생 관련 위험요인은 나이, 마취시간, 중환자실 재실 기간, 통증 사정도구 CNPS로 측정한 통증 강도였다. 즉, 섬망 발생 관련 위험은 나이가 많아질수록 1.07배(95% confidence interval

Table 1. Prevalence and Subtypes of Delirium Among Older Adults After Cardiac Surgery in Intensive Care Unit (N=528)

Variable	Category	n (%) or mean \pm SD
Delirium	Yes	218 (41.3)
	No	310 (58.7)
Onset of delirium	POD 0	82 (37.6)
	POD 1	115 (52.8)
	POD \geq 2	21 (9.6)
Delirium period (day)		2.28 \pm 5.71
	\leq 1 day	135 (61.9)
	\leq 2 days	39 (17.9)
	\leq 3 days	19 (8.7)
	>3 days	25 (11.5)
Delirium subtypes (n=218)	Hypoactives	149 (68.3)
	Mixed	42 (19.3)
	Hyperactives	27 (12.4)

POD=Postoperative day; SD=Standard deviation.

Table 2. Comparison of General Characteristics Between Delirium and Non Delirium (N=528)

Characteristic	Classification	Total (n=528)	Delirium (n=218)	Non delirium (n=310)	χ^2 or t	p-value
Age (year)	Total	71.2 \pm 5.0	72.3 \pm 5.1	70.4 \pm 4.8	-4.29	<.001
Gender	Men	286 (54.2)	124 (56.9)	162 (52.3)	1.10	.294
	Women	242 (45.8)	94 (43.1)	148 (47.7)		
Education	\leq Elementary school	155 (29.4)	70 (32.1)	85 (27.4)	7.91	.048
	Middle school	92 (17.4)	34 (15.6)	58 (18.7)		
	High school	170 (32.2)	79 (36.2)	91 (29.4)		
	\geq College	111 (21.0)	35 (16.1)	76 (24.5)		
BMI (kg/m ²)	Total	24.12 \pm 7.34	23.77 \pm 3.77	24.37 \pm 9.04	0.93	.355
	Underweight (<18.5)	20 (3.8)	12 (5.5)	8 (2.6)	3.09	.378
	Normal (18.5~22.9)	197 (37.3)	81 (37.2)	116 (37.4)		
	Overweight (23.0~24.9)	142 (26.9)	58 (26.6)	84 (27.1)		
	Obese (\geq 25.0)	169 (32.0)	67 (30.7)	102 (32.9)		

Values are presented as mean \pm standard deviation or n (%). BMI=Body mass index.

Table 3. Comparison of Clinical Characteristics Between Delirium and Non Delirium (N=528)

Characteristic	Classification	Total (n=528)	Delirium (n=218)	Non delirium (n=310)	χ^2 or t	p-value
DM	Yes	156 (29.5)	64 (29.4)	92 (29.7)	0.01	.937
	No	372 (70.5)	154 (70.6)	218 (70.3)		
HTN	Yes	302 (57.2)	121 (55.5)	181 (58.4)	0.43	.510
	No	226 (42.8)	97 (44.5)	129 (41.6)		
Visual impairment	Yes	113 (21.4)	43 (19.7)	70 (22.6)	0.62	.431
	No	415 (78.6)	175 (80.3)	240 (77.4)		
Hearing impairment	Yes	34 (6.4)	34 (15.6)	0 (0)	51.68	<.001
	No	494 (93.6)	184 (84.4)	310 (100)		
Type of surgery	Valve replacement	292 (55.3)	107 (49.1)	185 (59.7)	11.18	.025
	CABG	106 (20.1)	50 (22.9)	56 (18.1)		
	Aortic dissection	50 (9.5)	26 (11.9)	24 (7.7)		
	Complex surgery	54 (10.2)	28 (12.8)	26 (8.4)		
	Etc.	26 (4.9)	7 (3.2)	19 (6.1)		
Anesthesia time (hour)		5.07±1.35	5.39±1.38	4.85±1.29	-4.49	<.001
CPB	Time (minute)	115.92±51.74	124.39±55.26	110.24±48.52	-2.81	.005
	Yes	429 (81.3)	171 (78.4)	258 (83.2)	1.92	.165
	No	99 (18.8)	47 (21.6)	52 (16.8)		
Disease severity	APACHEII score	66.79±13.94	68.29±13.42	65.73±14.23	-2.09	.037
	ASAPS class	3.16±0.43	3.20±0.45	3.14±0.41	-1.65	.100
ICU LOS (day)		2.06±4.05	2.96±6.13	1.43±0.79	-3.68	<.001
Hospital LOS (day)		14.55±16.75	17.54±20.19	12.45±13.47	-3.25	.001
Albumin (g/dL)	Normal 3.5~5.2	40 (7.6)	12 (5.5)	28 (9.0)	2.28	.131
	Abnormal	488 (92.4)	206 (94.5)	282 (91.0)		
Creatinine (mg/dL)	Normal 0.7~1.4	304 (57.6)	132 (60.6)	172 (55.5)	1.35	.246
	Abnormal	224 (42.4)	86 (39.4)	138 (44.5)		
CRP (mg/dL)	Normal ≤0.6	2 (0.4)	1 (0.5)	1 (0.3)	0.06	.802
	Abnormal	526 (99.6)	217 (99.5)	309 (99.7)		
Pain score	CNPS	0.99±1.52	1.15±1.64	0.88±1.42	-1.97	.049
	NRS	3.37±1.75	3.36±1.86	3.38±1.67	0.09	.923
Duration of restrain (day)		2.04±4.48	2.12±1.51	1.97±5.72	-0.38	.706
Duration of intubation (day)		1.62±0.86	1.76±1.15	1.52±0.54	-3.18	.002
Duration of PCA (day)		3.47±0.91	3.59±0.98	3.39±0.86	-2.55	.011
Number of catheters		9.45±1.40	9.79±1.42	9.22±1.34	-4.71	<.001

Values are presented as *n* (%) or mean±standard deviation. APACHEII=Acute Physiology and Chronic Health Evaluation II; ASAPS=American Society of Anesthesiologists Physical Status; CABG=Coronary artery bypass graft; CNPS=Critical Care Non-Verbal Pain Scale; CPB=Cardiopulmonary bypass; CRP=C-reactive protein; DM=Diabetes mellitus; Etc.=Heart transplantation, atrial septal defect closure, septal myectomy, myxoma removal; HTN=Hypertension; ICU=Intensive care unit; LOS=Length of stay; NRS=Numeral Rating Scale; PCA=Patient controlled analgesia.

Table 4. Risk Factors of Delirium (N=528)

Variable	Univariate			Multivariate		
	OR	95% CI	p-value	OR	95% CI	p-value
Age	1.08	1.04~1.12	<.001	1.07	1.03~1.11	.002
Anesthesia time	1.35	1.18~1.54	<.001	1.21	1.04~1.41	.016
APACHEII score	1.01	1.00~1.03	.039	0.99	0.98~1.01	.882
ICU LOS	1.97	1.62~2.39	<.001	1.77	1.43~2.19	<.001
Hospital LOS	1.03	1.01~1.05	.003	1.01	0.99~1.02	.437
Pain score (CNPS)	1.12	1.00~1.26	.045	1.14	1.00~1.29	.044
Duration of intubation	1.59	1.17~2.16	.003	0.90	0.63~1.29	.566
Duration of PCA	1.29	1.06~1.57	.012	0.97	0.77~1.21	.775
Number of catheters	1.35	1.19~1.54	<.001	1.09	0.94~1.27	.274

APACHEII=Acute Physiology and Chronic Health Evaluation II; CI=Confidence interval; CNPS=Critical Care Non-Verbal Pain Scale; ICU=Intensive care unit; LOS=Length of stay; OR=Odds ratio; PCA=Patient controlled analgesia.

[CI]=1.03~1.11, $p=.002$), 마취시간이 길어질수록 1.21배(95% CI=1.04~1.41, $p=.016$), 중환자실 재실 기간이 하루 길어질수록 1.77배(95% CI=1.43~2.19, $p<.001$), 그리고 CNPS로 측정된 통증 강도가 1점 증가할수록 1.14배(95% CI=1.00~1.29, $p=.044$) 높아지는 것으로 나타났다.

논의

본 연구는 심장수술 후 노인 환자의 중환자실에서의 섬망 발생률 및 위험요인을 조사함으로써 수술 후 섬망을 조기 발견하고 섬망 발생 예방 간호중재 프로그램을 개발하기 위한 기초 자료를 제공하고 자 시도되었다.

본 연구결과 심장수술 후 노인 환자의 중환자실에서의 섬망 발생률은 41.3%로 나타났다. 심장수술 후 노인 환자의 섬망 발생률이 50%로 나온 연구[16]보다는 낮으나 25.6%가 나온 연구[14]보다는 높은 것으로 나타났다. 본 연구는 섬망 사정을 평균 2일 동안 중환자실에서만 CAM-ICU를 이용하여 사정하였지만 Kirfel 등[16]의 연구에서는 수술 후 첫 5일 동안 중환자실과 병동에서 CAM-ICU, 혼돈 사정 방법(CAM), 섬망 관찰척도(Delirium Observation Scale) 등의 여러 가지 사정도구를 이용하여 사정하였다. 따라서 섬망 사정기간과 사정도구에 따라 섬망 발생률에 영향[15]을 미친 것으로 생각된다. 또한 Spiropoulou 등[14]의 연구는 본 연구와 같이 심장수술 후 중환자실에 입실한 노인 환자를 대상으로 하였으나 심장수술에서 섬망 발생률이 높은 대동맥류 수술[6]이 포함되지 않았고 기관 삽관기간이 24시간 이내가 89.5%를 차지하였다. 그렇지만 본 연구에서는 대동맥류 수술이 포함되었고 기관 삽관기간이 평균 1.62일로 나타나 수술 종류와 기관 삽관기간의 차이로 본 연구에서 섬망 발생률이 높게 나온 것으로 사료된다. 이는 연구 대상자의 특성과 환경, 연구 방법에 따라 섬망 발생률이 차이가 있는 것으로 생각되며 지속적인 연구가 필요함을 알 수 있다.

섬망 발생 시기는 수술 당일(37.6%)과 1일째(52.8%)에 대부분 나타났다 섬망 발생 기간은 평균 2.28 ± 5.71 일로 1일 이내(61.9%)가 가장 높게 나타났다. 외과계 병동 노인 수술 환자에서 수술 후 1일째(58%)에 섬망이 가장 많이 발생하였고 섬망 발생 기간이 평균 2.16 ± 1.28 일이었다는 연구[18]와 유사하다. 본 연구 결과로 심장수술 후 노인 환자에서 수술 후 1일 이내에 섬망 발생에 유의하여 사정해야 함을 제안한다.

반면에 성인 환자를 대상으로 심장수술 후 중환자실에서 섬망이 3.35 ± 4.05 일에 발생했으며 5.97 ± 5.36 일 동안 지속되었다는 연구[8]와 차이가 있다. Sugimura 등[8]의 연구는 10년 전인 2013년에 심장수술을 받은 성인 환자를 대상으로 하여 본 연구와 섬망 발생 시기와 기간의 차이가 있는 것으로 보인다. 지난 몇 년 동안 수술 후 섬망은 의료진의 관심을 끌지 못했고 치료에 있어서도 병원마다 차이

가 있었지만 최근 수술 후 섬망에 대한 관심이 증가하여 이에 대해 많은 연구가 이루어지고 있다[15]. 대한중환자의학회 표준화 위원회에서는 중환자실에서의 적절한 치료를 제공하기 위해 2013년 성인 중환자실 통증, 초조, 섬망 임상지침을 개발하여 섬망에 대한 치료적 접근 및 관리에 상당한 발전이 있었다[21]. 이후 2018년 중환자실 환자의 통증, 초조/진정, 섬망, 부동성, 수면장애 예방 및 관리를 위한 임상진료지침 개발, 2021년 개정하는 등 섬망을 예방하고 관리하기 위한 노력을 기울이고 있다[21]. 이러한 연구에서 섬망 위험요소, 섬망 사정도구로 섬망에 대한 정기적 평가, 약물 및 비약물 중재프로그램을 제시하고 있다. 이로 인해 섬망을 조기 발견하고 다성분 비약물 중재프로그램인 인지능력자극, 수면의 질 개선, 각성 개선, 조기 재활[15,21], 청각 및 시각장애 감소, 가족 참여[21] 등을 시행함으로써 섬망에 대한 예방과 관리가 가능하게 되어 10년 전과 비교하여 본 연구에서 섬망의 발생 시기와 발생 기간이 감소한 것으로 생각된다.

다만, 본 연구에서는 중환자실 재실 기간 동안만의 섬망 사정 결과를 확인하고 퇴실 후 병동에서의 기록은 확인하지 않아 실제 섬망이 발생한 기간은 더 길었을 가능성도 배제할 수 없다. 최근 수술 환자의 고령화로 인하여 섬망 고위험군이 증가함에 따라 일반 병동에서도 섬망 환자의 발생 가능성이 높아지고 있다[18]. 외과계 병동에서 노인 수술 환자의 섬망 발생률은 4.3% [18]로 나타났고 위험요인도 다양하게 나타나고 있어 병동에서의 노인 섬망 발생 및 간호에 대한 연구가 필요함을 알 수 있다. 따라서 심장수술 후 중환자실에서뿐 아니라 퇴원까지 섬망 발생에 대한 연구 시에는 다른 결과가 나타날 것으로 예상된다.

섬망 양상은 저활동형 섬망이 많이 나타났다. 이는 중환자실과 병동에 입원한 18세 이상 성인환자를 대상으로 섬망 아형별 위험요인을 분석한 연구[27]에서 고령이 저활동형 섬망의 위험요인으로 나타난 결과와 유사하다. 그러나 외과 중환자실에 입실한 19세 이상 성인 환자의 섬망 아형별 관련요인을 분석한 연구[23]에서는 과활동형 섬망 환자의 나이가 저활동형 섬망 환자보다 많았다는 결과와는 다르다. 이는 대상자의 특성과 임상환경에 따라 섬망 아형은 다르게 나타나는 것으로 생각된다. 저활동형 섬망은 기관 삽관기간 연장, 중환자실 재실 기간 연장, 사망률 증가, 욕창 발생 증가, 도구적 일상생활 수행능력(Instrumental Activities of Daily Living) 의존성 증가[22] 등의 부정적 결과를 가져온다. 또한 과활동형 섬망은 과도한 행동, 빠른 말투, 분노, 공격성, 빠른 움직임, 자극에 대한 과반응의 증상을 보여 발견이 쉽지만 저활동형 섬망은 언어저하, 움직임 둔화, 나태함, 무관심, 무기력함 등과 같은 증상의 특성상 발견이 어려워 감별이 늦어지게 되거나 우울증이나 치매로 잘못 진단되기도 한다[27]. 따라서 구조화된 선별도구를 이용하여 저활동형 섬망의 조기 발견에 관심을 가져야 하고 나아가 아형별 특성에 맞는 간호중재가 필요하다고 할 수 있다. 또한 RASS 점수 평가 항목에 따라 환자의 의식, 움직임, 눈 맞춤, 목소리 및 물리적 자극에 대한 반응에 대하여 중

점적으로 확인한다면 저혈동형 섬망을 조기 발견할 수 있을 것이다.

본 연구결과 섬망 발생 관련 위험요인은 중환자실 재실 기간, 마취 시간, 통증 사정도구 CNPS로 측정한 통증 강도, 나이 순으로 나타났다. 중환자실 재실 기간은 섬망 발생 관련 첫 번째 위험요인이었다. 이는 심장수술 후 섬망 발생의 결과 및 위험요인에 대한 체계적 문헌고찰과 메타분석[7,15]에서도 유의하게 언급된 위험요인이었다. 본 연구결과 중환자실 재실 기간이 하루 길어질수록 섬망 발생률은 1.77배 증가하였다. 이는 심장수술 후 18세 이상 성인 환자를 대상으로 수술 후 섬망의 위험요인에 대해 메타 분석한 국외 선행연구[7]에서의 1.40배보다는 높고 중환자실 내 19세 이상 성인 심장수술 환자를 대상으로 한 국내 선행연구[6]에서의 1.72배와 비슷한 결과이다. 많은 연구[6,7,15,16]에서 중환자실 재실 기간이 길어질수록 수술 후 섬망 발생의 위험이 높았고 수술 후 섬망의 발생은 중환자실 재실 기간을 연장시키는 결과를 가져왔다. 심장수술 후 섬망이 발생한 환자는 인지장애, 의식 저하, 행동이상 등을 일으켜 뇌혈관 질환, 출혈, 감염, 탈수, 욕창, 호흡저하 및 정맥혈전증 등의 합병증[15]이 나타날 수 있으며 이는 중환자실 재실 기간의 연장을 가져오게 되고 사망률과 간호 업무량 및 의료비용 상승의 부정적 결과를 초래하게 된다[16]. 따라서 섬망 발생 고위험군 환자를 파악하여 중환자실 입실 초기에 섬망 예방 및 관리를 위한 중재가 적용되도록 하는 것이 필요하다. 또한 심장수술 후 중환자실 재실 기간에 영향을 미치는 요인을 파악하고 이를 최소화할 수 있는 방안을 담당 의료진뿐 아니라 영양 관리를 위한 영양사, 약물관리를 위한 약사, 능동적 재활제공을 위한 재활치료사 등과 함께 다학제적으로 모색해야 할 것이다.

마취시간은 섬망 발생 관련 유의한 두 번째 요인이었다. 본 연구는 마취시간이 길어질수록 섬망 발생률이 1.21배 증가하였다. 척추 수술을 받은 18세 이상 성인 환자의 중환자실과 병동에서 섬망 발생 위험요인을 조사한 국내 선행연구[9]에서는 마취시간이 길어질수록 섬망 발생이 1.22배 증가하여 본 연구와 유사한 결과를 보였으나 외과계 병동 노인 수술 환자의 섬망 발생 위험요인을 조사한 국내 선행연구[18]에서는 마취시간이 유의한 차이를 보이지 않았다. 마취를 위해 사용하는 약과 마취방법들은 섬망을 발생하는 원인으로 여겨지므로 [11] 마취시간이 길어질수록 마취제에 대한 노출시간이 길어지게 되어 섬망 발생에 영향을 미친 것으로 생각된다. 따라서 마취시간을 줄이기 위해 수술 전 마취 평가 계획에서부터 환자 상태를 정확하게 파악하고 집도 과와 마취통증의학과가 상의하여 환자 맞춤형 최적의 마취와 수술 방법을 선택하고 필요 시 타과 의료진, 적절한 약물 선택을 위한 약사, 마취기 관리를 위한 의공학팀과 함께 다학제적으로 협력하여야 한다. 또한 의료진 간에 정확한 의사소통으로 수술준비 지연, 집도의 도착 지연 등과 같이 인적 요인으로 인한 마취시간 지연이 발생하지 않도록 노력하여야 한다. 뿐만 아니라 새로운 수술 기술과 마취방법, 마취제가 지속적으로 개발되고 있어 이에 따른 수술 후 섬망 발생률과 위험요인을 조사하는 연구도 필요할 것으로 사료된다.

섬망 발생 관련 세 번째 위험요인은 CNPS로 사정한 통증 강도였다. CNPS로 측정한 통증 강도가 1점 증가할수록 섬망 발생률은 1.14배 높아졌다. 이는 척추수술 후 70세 이상 노인 환자의 섬망과 통증과의 관계를 살펴본 선행연구[28]에서 섬망이 발생한 환자의 수술 후 1, 2, 3일째 유의하게 통증이 더 높았다는 결과와 유사하지만 중환자실 내 심장수술 후 성인 환자에서 수술 후 통증과는 유의한 관계를 보이지 않은 국내의 선행연구[6,17]와는 차이가 있었다. 통증과 섬망 사이의 상호작용은 복잡하고 다 방향적이며 특히 노인의 경우 통증이 섬망의 위험요인일 수 있지만 통증 관리를 위해 제공되는 진통제가 오히려 섬망의 위험을 증가시킬 수 있다[29]. 따라서 통증으로 인해 섬망 발생 위험이 증가되었는지 통증 관리를 위해 사용한 진통제의 부작용으로 인해 섬망 발생 위험을 증가시켰는지 시간적 우선순위를 조사하는 전향적 연구가 필요하다. 통증은 매우 주관적이므로 자가 보고를 통해 가장 잘 평가되지만 의식수준의 변화, 기관 내 삽관, 진정제 투여 등의 여러 가지 이유로 통증을 표현할 수 없는 환자들의 통증을 정확하게 평가할 수 있는 도구로 국내에서 CNPS가 개발되었다[25]. CNPS는 객관적인 통증 관찰도구로 1분 이상 얼굴표정, 신체반응, 기계 호흡 순음 또는 언어반응을 관찰 후 가장 높은 통증 점수를 측정[26]하는데 심장수술 후에는 마취에서 회복되지 않은 상태로 중환자실로 입실하여 혈액학적 상태가 안정되면 의식 상태를 회복하도록 하고 있어 환자의 통증상태를 CNPS로 사정하고 있다. 간호사는 환자와 가장 많은 시간을 보내는 의료인으로 환자의 통증을 정확하게 평가하여 적절한 통증 관리를 받을 수 있도록 하는 것이 중요하다[30]. 하지만 간호사는 환자의 수술 후 통증을 과소평가하고 있고 통증 관리에 대한 지식과 이해의 부족으로 수술 후 환자들은 적절한 통증 관리를 받지 못하고 있다[30]. 따라서 심장수술 직후 의사소통이 불가능하여 주관적으로 통증을 표현하지 못하는 환자들은 면밀히 살피고 객관적인 평가도구를 이용하여 통증을 정확하게 사정하고 중재를 제공하여야 할 것이다.

나이는 섬망 발생 관련 유의한 네 번째 위험요인이었다. 나이는 여러 연구[8,11-13,30]에서 섬망 발생 관련 유의한 위험요인이었다. 본 연구에서는 나이가 많아질수록 섬망 발생률이 1.07배 증가하였다. 국외 선행연구에서 심장수술 후 나이에 따라 섬망 발생이 1.06~1.11배[8,12,13] 증가하여 본 연구와 비슷한 결과를 보였다. 나이의 증가가 섬망 발생의 위험요인인 이유는 여전히 불분명하지만 [8] 노인들은 여러 만성 질환, 신체기능의 저하, 다약제 복용 등으로 인해 수술 후 섬망 발생이 증가할 수 있다[2]. 따라서 간호사는 수술 후 노인 환자들을 주의 깊게 사정하여 섬망을 조기에 발견할 수 있어야 하고 섬망 발생 위험요인에 대한 지속적인 평가 및 섬망 예방 간호중재를 실시하여야 할 것이다.

본 연구는 서울시 소재 일개 상급종합병원의 심장수술 후 노인 환자를 대상으로 전자의무기록을 분석한 후향적 조사연구로 연구결과를 일반화하는 데 제한점이 있다. 하지만 본 연구는 심장수술 후 노

인 환자의 섬망 발생에 대한 위험요인을 파악함으로써 간호 교육적 측면에서 수술 후 노인 환자 간호를 위한 교육 자료로 사용될 수 있고 간호 실무적 측면에서 섬망 발생을 예측하여 향후 섬망 예방 및 관리를 위한 간호중재프로그램 개발을 위한 기초 자료를 마련했다는 데 의의가 있다. 또한 간호 연구적 측면에서 국내에서 연구되지 않은 섬망 발생의 고위험군인 심장수술 후 노인 환자의 중환자실에서의 섬망 발생률과 위험요인에 대한 최초로 시도된 연구라는 점에서 의의가 있다.

결론 및 제언

본 연구결과 심장수술 후 노인 환자의 중환자실에서의 섬망 발생률은 41.3%였으며 발생 시기는 수술 후 1일 이내, 섬망 아형은 저활동형 섬망이 많이 나타났다. 섬망 발생 관련 위험요인은 중환자실 재실 기간, 마취시간, CNPS로 측정된 통증 강도, 나이 순으로 유의하게 분석되었다. 따라서 심장수술 후 노인 환자의 중환자실에서 섬망 발생을 예방하기 위해 의료진들은 다학제적으로 협력하여 중환자실 재실 기간과 마취시간을 최소화하기 위한 노력을 기울여야 하고 의식이 돌아오지 않고 의사소통이 잘 되지 않아 주관적으로 통증을 표현하지 못하는 기간 동안에는 통증을 사정하여 적절한 통증 관리를 해야 할 것이다. 또한 나이가 많은 환자일수록 더욱더 주의 깊게 사정하여 섬망을 조기에 발견할 수 있어야 하고 섬망 발생 위험요인에 대한 지속적인 평가 및 섬망 예방 중재를 실시하여야 할 것이다.

본 연구결과를 토대로 다음과 같이 제언한다. 첫째, 후향적 연구로 섬망 발생을 조사하였기 때문에 실제 섬망 발생이 누락되었을 가능성이 있으므로 전향적 조사방법을 적용한 반복 연구를 제언한다. 둘째, 섬망 발생한 환자의 통증 사정 및 관리에 대한 전향적 연구가 필요하다. 셋째, 본 연구결과에서 확인된 섬망 발생 관련 위험요인을 포함한 섬망 예방을 위한 효과적인 간호중재 프로토콜을 개발하고 실무에 적용하는 실험연구 및 효과평가 연구를 제언한다.

ORCID

Jeong-Ok Ryu, <https://orcid.org/0009-0003-8162-3161>

Gwi-Ryung Son Hong, <https://orcid.org/0000-0001-7460-4972>

Authors' contribution

Study conception and design - JOR and GRSH; Supervision - GRSH; Data collection and processing - JOR; Analysis and interpretation of the data - JOR and GRSH; Literature search - JOR; Writing - JOR; Critical review of the manuscript - JOR and GRSH; Final approval - GRSH

Conflict of interest

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

Funding

None.

Data availability

Please contact the corresponding author for data availability.

Acknowledgements

None.

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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 경우에는 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 위반여부는 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 지체없이 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, 심사자의 관계 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 학위논문을 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 한국간호학회 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 연구결과와 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 굵지 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: $p < .001$, $r = .14$, $R^2 = .61$
 - 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 $M \pm SD$, t, χ^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 숫자 이후에 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.org>에서 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 기재한다.
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: McGraw 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.
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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.

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5. 학술회의나 심포지엄의 자료(Proceedings)

- 저자. 발표자료명: 부제. In: 편집자, editor(s). 모음집명. 학술회의명; 학술회의일자; 개최지. 발행지: 출판사; 출판연도. p. 페이지수. 순으로 기재한다.
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6. Web 자원

1) 전자저널

- 저자. 논문명. 연속간행물명 [자료유형]. 출판일 [인용일자]; 권(호): 페이지수. Available from: URL 순으로 기재한다.
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2) Web 자료

- 저자. 제목[자료유형].출판지: 출판사; 출판일[update 날짜; 인용일자]. Available from: URL
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7. 이차 자료에서의 인용

- 이차 자료는 일차 자료를 찾을 수 없는 불가피한 상황에서만 사용하고, 일차자료에서 인용되었음을 참고문헌에 밝힌다.
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■ 논문 심사

1. 투고된 원고의 1차 심사는 이중맹검법을 사용하여 2인의 심사위원이 심사하며 심사결과 '수정 후 게재'로 판정한 논문은 1인의 출판위원이 최종 심사를 한다. 석사학위 논문과 박사학위 논문은 심사를 받은 후 게재할 수 있다. 심사에 관한 세부사항은 별도의 규정에 따른다.
2. 원고채택 여부는 논문심사위원 및 출판위원회에서 결정한다. 채택된 논문의 게재 순서는 최종 원고 완성일자와 접수된 순서를 감안하여 출판위원회에서 정한다. 출판에 관한 세부사항은 별도의 규정에 따른다.
3. 게재논문 인쇄의 교정은 저자가 하며, 게재료, 특수 조판대, 별책대, 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 제기된 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.
6. 이 규정은 2011년 1월부터 시행한다.
7. 이 규정은 2012년 1월부터 시행한다.
8. 이 규정은 2012년 5월부터 시행한다.
9. 이 규정은 2013년 1월부터 시행한다.
10. 이 규정은 2013년 8월부터 시행한다.
11. 이 규정은 2014년 1월부터 시행한다.
12. 이 규정은 2014년 8월부터 시행한다.
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.
27. 이 규정은 2023년 10월부터 시행한다.

논문을 투고하실 때는 반드시 다음의 사항들을 검토하셔서 □에 V로 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 관련하여 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)

1. 저작권 이양

본 논문이 노인간호학회지에 출간될 경우 그 저작권을 한국노인간호학회에 이양합니다. 이에 노인간호학회는 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 내용에 대해 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 구성된 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 심사과 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 원하여 한하여 심사하며 간호학 석사 및 박사 학위논문은 심사하고 게재할 수 있다.
5. 투고자격과 투고요령에 부합되지 않는 원고는 접수하지 않는다.
6. 논문 1편당 심사위원은 2인으로 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'으로 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. 2인의 심사위원 중 1인이 '게재불가'로 판정하였을 경우 편집위원회에서 최종 게재 여부를 판단하며, 2인이 '게재불가'로 판정하였을 경우에는 게재할 수 없다.
13. 심사내용은 저자 이외의 사람에게서는 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.
6. 이 규정은 2023년 10월부터 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 주제넘 및 연구방법론에 합당한 2명의 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.

General Information

Journal of Korean Gerontological Nursing is the official publication of the Korean Gerontological Nursing Society. This journal provides up-to-date knowledge for nursing educators, practitioners, and researchers of gerontological nursing field in Korea where seen as one of the fastest aging societies in the world. The journal emphasizes articles on the issues most important for addressing emerging clinical issues in acute and long-term care for older people. In addition, this journal aims to contribute to the exchange of information and the spread of knowledge at the national and international level on the future prospects and countermeasures for the care issues related to aging. The Journal accepts manuscripts reporting quantitative, qualitative, methodological, philosophical, and theoretical research, meta-analyses, integrative and systematic reviews, and instrument development, with the aims of improving the wellness and quality of care of the older adult population. Manuscripts in other categories will be considered by the Editorial Board.

The official title of the journal is 'Journal of Korean Gerontological Nursing' (pISSN 2384-1877, eISSN 2383-8086) and the abbreviated title is 'J Korean Gerontol Nurs'. The journal is published in February 28th, May 31th, August 31th, and November 30th. All submitted manuscripts are peer-reviewed by three reviewers. The text may be written in Korean or English. The abstracts, acknowledgements, tables, figures, and references should be written in English. The articles in this journal are indexed in National Research Foundation of Korea (NRF) database (Korea Citation Index). The circulation number is 500. Full text is available in the following URL address of the Journal: <http://www.jkgn.org> This Journal is indexed in SCOPUS, CINAHL, ScienceCentral, Google scholar and KCI. All rights reserved to the Korean Gerontological Nursing Society. No portion of the contents may be reproduced in any form without written permission of the publisher.

Research and Publication Ethics

The Journal of Korean Gerontological Nursing Editorial Board

is sensitive to ethical responsibility and expects authors to respect and to be responsive to the rights of the research participants.

The policies on the research and publication ethics of JKGN follow the guidelines set by Korean Association of Medical Journal Editors, the Committee on Publication Ethics (COPE, <http://publicationethics.org/>), Ministry of Education and National Research Foundation of Korea with respect to settlement of any misconduct.

Research Ethics

All manuscripts should be prepared in strict observation of research and publication ethics guidelines recommended by the Council of Science Editors (CSE, <http://www.councilscienceeditors.org/>), International Committee of Medical Journal Editors (ICMJE, <http://www.icmje.org/>), and Korean Association of Medical Journal Editors (KAMJE, <http://www.kamje.or.kr/>). Any study involving human subjects or human data must be reviewed and approved by a responsible institutional review board (IRB). Please refer to the principles embodied in the Declaration of Helsinki (<https://www.wma.net/what-we-do/medical-ethics/declaration-of-helsinki/doh-oct2008/>) for all investigations involving human subjects and materials. Experiments involving animals should be reviewed by an appropriate committee for the care and use of animals. The authors must be able to state that the research involving humans or animals has been approved by a responsible IRB and conducted in accordance with accepted national and international standards.

Authorship

An author is considered as an individual who has made substantive intellectual contributions to a published study and whose authorship continues to have important academic, social, and financial implications. Researchers should adhere to the authorship criteria of ICMJE, 2019 (<http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html>), which state that

“authorship credit should be met on all of the following: 1) substantial contributions to conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; 2) drafting the work or revising it critically for important intellectual content; 3) final approval of the version to be published; and 4) agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are investigated and resolved appropriately.” All other contributors should be listed in the acknowledgments section. These authorship criteria are intended to reserve the status of authorship for those who deserve credit and can take responsibility for the work. The authors are obliged to participate in the peer review process for other submitters’ manuscripts.

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Conflict of interest exists when an author (or the author’s institution), reviewer, or editor has financial or personal relationships that inappropriately influence his/her actions (such relationships are also known as dual commitments, competing interests, or competing royalties). All authors should disclose their conflicts of interest, i.e., (1) financial relationships, (2) personal relationship, (3) academic competition, and (4) intellectual passion. These conflicts of interest must be included as a footnote on the title page or in the acknowledgement, section. Each author should certify the disclosure of any conflict of interest with his/her signature.

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publication ethics not stated in these instructions, International standards for editors and authors by the Committee on Publication Ethics(COPE)(<https://publicationethics.org/resources/resources-and-further-reading/international-standards-editors-and-authors>) can be applied.

Process to manage the research and publication misconduct

When the Journal faces suspected cases of research and publication misconduct such as a redundant (duplicate) publication, plagiarism, fabricated data, changed in authorship, undisclosed conflicts of interest, an ethical problem discovered with the submitted data, complaints against editors, and other issues, the resolving process will follow the flowchart provided by the Committee on Publication Ethics(<https://publicationethics.org/guidance/Flowcharts>). The Editorial Board of JKGN will discuss the suspected cases to reach a decision. In no case shall the Editorial Board of JKGN encourage such misconduct, or knowingly allow such misconduct to take place. JKGN will not hesitate to publish errata, corrigenda, clarifications, retractions, and apologies when needed.

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1. Anyone with an interest in gerontological nursing and related disciplines can become an author.
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Editor-in-Chief

Dukyoo Jung, PhD, RN.
Editorial office of the JKGN
College of Nursing, 52, Ewhayeodae-gil, Seodaemun-gu, Seoul
03760, Republic of Korea
Email: djung@ewha.ac.kr Fax: +82-2-3277-2850

Managing Editor

Leeho Yoo
Tel: +82-10-2899-2184 Email: jkgneditor@gmail.com
Fax: +82-2-3277-2850

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Original article: These include full papers reporting original research, on gerontological nursing.

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Editorials: These include comments by organizations or individuals on topics of current interest, by invitation only.

Case report: Description of clinical cases should be unique and provide discussion that help advancement of nursing practice for better outcomes.

Manuscript Preparation

1. Manuscripts should be written in Korean or English. Manuscripts written in English should be submitted with a certificate of English editing.
2. Manuscripts should be typed in a 12-point font, double-spaced, in either Times New Roman or Courier, with a margin of at least one inch on all sides, and should be prepared according to the Citing Medicine: The NLM (National Library of Medicine) Style Guide for Authors, Editors, and Publishers, 2nd ed. If there are any discrepancies between the JKGN guidelines and the NLM Manual, the former has precedence.
3. The length of manuscript is limited to 6,000 words (excluding title page, abstract, references, tables, figures, and any supplemental digital content).
4. All manuscript pages are consecutively numbered throughout the paper (including references and tables). Original manuscripts should be no more than 20 double-spaced pages in length including tables, figures, and references. An abstract, notes, references, tables, and figures should be on separate pages. Illustrations submitted should be clean originals or digital files.

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1. Title page: The title page should include the name, title, affiliation, and ORCID numbers of all authors. This page should also include a mailing address, phone and fax numbers, acknowledgments, and authorships. Information identifying the authors should not appear elsewhere in the manuscript.

- 1) Title - the title should be concise and informative, and limited to 100 characters.
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- 4) Running title - for all submissions except editorials, provide a short title limited to 45 characters.
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- 10) Word, reference, and table/figure count - for the abstract (if applicable), main text, references, and tables/figures.

2. Abstract: Abstracts are limited to 250 words, and should be

typed double-spaces on a separate page. It should cover the main factual points, including statements of the purpose, methods, results, and conclusion. The abstract should be accompanied by a list of three to five keywords for indexing purposes; be very specific in your word choice. Use the MeSH keywords (<http://www.nlm.nih.gov/mesh/meshhome.html>).

3. Text

Text should include the following sections: Introduction and Objectives, Methods, Results, Discussion, and Conclusion.

- 1) **Introduction and Objectives:** Clearly state the need for this study and the main question or hypothesis of the study.
- 2) **Methods:** Describe the study design, setting and samples, ethical considerations, measurements/instruments, data collection/procedure, and data analysis used.

- *Present an “Ethics statement” immediately after the heading “Methods” in a boxed format*

Example:

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.

- *Description of participants*

Ensure correct use of the terms sex (when reporting biological factors) and gender (identity, psychosocial or cultural factors), and, unless inappropriate, report the sex or gender of study participants, the sex of animals or cells, and describe the methods used to determine sex or gender. If the study was done involving an exclusive population, for example in only one sex, authors should justify why, except in obvious cases (e.g., prostate cancer). Authors should define how they determined race or ethnicity and justify their relevance.

- *Software*

References to software programs used should be stated in the methods section. Example: Analyses were performed using SPSS, version 26 (IBM Corp. Armonk, NY, United States).

- Authors are encouraged to describe the study according

to the reporting guidelines relevant to their specific research design, such as those outlined by the EQUATOR Network (<http://www.equator-network.org/home/>) and the United States National Institutes of Health/National Library of Medicine (http://www.nlm.nih.gov/services/research_report_guide.html)

- 3) **Results:** This section should be clear and concise.

- 4) **Discussion:** This section should explore the significance of the reported findings.

- 5) **Conclusion:** State the conclusions and recommendations for further study. Do not summarize the study results.

4. References

1) In-text Citation

References follow the NLM style. Reference should be numbered serially in the order of appearance in the text, with numbers in brackets ([]). When multiple references are cited together, use commas to indicate a series of non-inclusive numbers (e.g., [1], [2,3], [4-6], or [7-9,13]). If a reference is cited more than once, use the original reference number. If there are one or two authors, include the last name of each. If there are three or more authors, include only the last name of the first author followed by “et al.” (e.g., Beck [3], Roberts & Gere [7], Vandervoort et al. [12]).

2) Reference lists

Number of references should be 30 or less for a regular article except for a manuscript on research (Systematic Review, Structural Equation Model, etc) which have no limit on references. Prepare the reference list as follows:

- *Journal articles*

Up to 6 authors

Elham H1, Hazrati M, Momennasab M, Sareh K. The effect of need-based spiritual/religious intervention on spiritual well-being and anxiety of elderly people. *Holistic Nursing Practice*. 2015;29(3):136-43. <https://doi.org/10.1097/HNP.0000000000000083>

More than 6

authors 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.2010.03.01>

- *Books*

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

- *Technical and research report*

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 October. Report No. HETA 2009-0206-3117.

- *Electronic Media*

Wilcox LS. 2010 life tables for Korea. Biological Procedures Online [Internet]. 2005 Nov [updated 2005 Sep 12; cited 2007 Jan 5]; 8(1):194-215. Available from: http://kostat.go.kr/portal/korea/kor_nw/3/

5. Tables / Figures

- 1) Tables/Figures should be self-contained and complement, but not duplicate, information contained in the text. Tables/Figures should be numbered consecutively in Arabic numerals. Each table and figure should be placed on a separate page and in English. There should be no more than five tables and figures in total.
- 2) The title of the table shall be placed on top of the table and the first letters of important words shall be capitalized (e.g., Table 1. Overall Responses to Question Types). The title of the figure shall be placed below the figure with the first letter capitalized (e.g., Figure 1. Scatter plot for study variables between cancer survivors and their spouses.). When there are two or more figures for the same number, alphabets shall be placed after the Arabic number. (e.g., Figure 1-A, Figure 1-B).
- 3) Always, define abbreviations in a legend at the bottom of a table/ figure, even if they have already been defined in the text. List abbreviations in alphabetical order.
- 4) All units of measurements and concentrations should be designated. And when reporting decimal numbers, the significance level shall be rounded off to three decimal places; means, standard deviations, and a test statistic, to two decimal places; and percentages and mean age, to one decimal place (e.g., $p = .005$, 32.84 ± 3.47 , 90.6%, 56.4 years).

Review Process

Similarity Test

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회장	박명화	(충남대학교 간호대학)	mhpark@cnu.ac.kr
부회장	조은희	(연세대학교 간호대학)	ehcho@yuhs.ac
총무 이사	백수미	(중원대학교 의료보건대학 간호학과)	godqhrgrksdlstod@jwu.ac.kr
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