의학석사 학위논문

노년 환자의 입원 진료 과정에서 미충족 요구와 장애요인 : 환자와 보호자의 관점에서 연령-친화 의료 시스템 틀을 활용한 질적 연구

Unmet needs and barriers in providing hospital care for older adults: A qualitative study using the Age-Friendly Health System framework from the perspectives of patients and caregivers

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Abstract

This study aimed to identify unmet needs and barriers to improving inpatient care for older adults at an academic hospital in Korea using a qualitative dyadic in-depth interview design and the Age-Friendly Health Systems (AFHS) framework.

Twelve participants, six patients, and six family caregivers were engaged in six semi-structured interviews. The mean age of the patients and caregivers was 77.7 and 52.7 years, respectively. The data were analyzed qualitatively according to the Consolidated Criteria for Reporting Qualitative Research guidelines. The analysis method encompassed a thematic framework analysis via the AFHS 4Ms framework, consisting of four domains 'What Matters,' 'Mentation,' 'Medication,' and 'Mobility.'

Using the AFHS 4Ms framework, we identified multiple barriers and unmet needs in the provision of inpatient care to older adults in hospitals. The main barriers identified in the 'What matters' domain were a lack of individualized care plans and shared decision-making that accounts for the variety of priorities among older patients and differences in complexity. In the 'Mentation' domain, the main issues revolved around communication barriers stemming from patient-related factors, which subsequently led to secondary issues and unmet mental health needs among older adults. In the 'Medications' domain, the primary barriers to delivering adequate and safe pharmacotherapy encompassed patient-related factors, medication characteristics, institutional factors, and prescribing cascade & polypharmacy issues. In the 'Mobility' domain, the main challenges were the limitations of rehabilitation therapy during hospitalization, the lack of transitional rehabilitation facilities for post-discharge mobility recovery, and environmental barriers that make mobility challenging for older patients.

This study highlights the need to improve inpatient care for older adults in academic hospitals in Korea. The identified unmet needs and barriers can be used to guide a more patient-centered approach for an age-friendly inpatient environment.

Keywords: geriatrics, age-friendly health systems, 4Ms framework, patient-centered care, geriatric adverse outcomes

목 차

표 및 그림 목차

Introduction

The global demographic shift towards an aging population has been ongoing for the past few decades, and in conjunction with the COVID-19 pandemic, the management of vulnerable older inpatients has become an even more crucial issue in our society.[1-3] Older patients often have complex healthcare needs that encompass multiple chronic conditions and functional impairments. These factors increase the risk of negative outcomes during their hospitalization — outcomes such as delirium, pressure ulcers, and falls.[4-6] These geriatric adverse consequences can further worsen the functional status of older patients, leading to a greater likelihood of unplanned readmission, longer hospital stays, and long-term care institutionalization following discharge. In addition, older patients are at a higher risk of death following hospitalization.[7-9]

Previous studies have shown that patient-centered approaches combined with geriatric frameworks can improve health outcomes for older adults with complex health needs during hospitalization.[3,10-12] These approaches often involve coordinating care across multiple healthcare services and various personnel, personalizing treatment to meet the unique needs of each patient, and providing education and support for self-management and transition to long-term care settings. One of the most widely adopted frameworks is the Age-Friendly Health Systems (AFHS) initiative, which aims to create age-friendly health systems through the implementation of the 4Ms framework, relating to: 'What matters,' 'Medication,' 'Mentation,' and 'Mobility. ' This framework was led by the John A. Hartford Foundation and the Institute for Healthcare Improvement (IHI) in partnership with the American Hospital Association and the Catholic Health Association of the United States.[5,13]

Although Korea is facing a rapidly aging population, hospitals have not fully adopted patient-centered geriatric care. This is because the existing medical system is largely based on a fragmented, specialty-oriented approach developed in the late 20th century.[13-17] To

address this issue, the Asan Medical Center (the largest academic hospital in Korea) established an intramural acting group, the Asan Multidisciplinary Committee for Seniors (AMCS), in 2020, with the goal of cultural adaptation and implementation of the AFHS framework in the practice system.

A previous qualitative study, which explored unmet needs and barriers faced by older inpatients, employed a qualitative focus group design involving healthcare providers and hospital employees, leading to the identification of numerous obstacles and unaddressed issues[18]. This study utilized the 4Ms framework to analyze key themes in each domain and highlighted the significance of individualized and patient-centered care. However, it had a limitation in that it focused only on healthcare providers and hospital employees as study participants, excluding the perspectives of patients and caregivers who are the recipients of care. Therefore, as a succeeding study, this study aims to conduct in-depth interviews with patients and caregivers, utilizing the 4Ms framework to perform a thematic analysis of unmet needs and barriers. This approach would reveal the differences and commonalities from the viewpoints of service providers and beneficiaries.

The ultimate objective of this study was to develop an age-friendly health system suitable for our environment and culture, encompassing both patients and the national health system. Therefore, this study used qualitative dyadic, in-depth interviews with patients and caregivers to identify unmet needs and barriers to improving older inpatient care. The intention was to leverage these insights to steer the development of more patient-centered and age-friendly inpatient care in a rapidly aging country.

Materials and Methods

Study design

This study was conducted between May 2022 and October 2022. Dyadic, semi-structured, and in-depth interviews were conducted to identify existing unmet needs and barriers for older adults receiving inpatient care at an academic hospital in Korea. The patients and their caregivers were paired as dyads, and interviews were conducted once each. Data collection and analysis followed the Consolidated Criteria for Reporting Qualitative (COREQ) research guidelines.[19]

Sampling strategy

A purposeful sampling approach was used to enroll participants for in-depth interviews. Although it may not offer high generalizability, this method allows researchers to gather valuable insights by specifically choosing individuals who align with the research objectives. Moreover, it ensures a diverse range of perspectives and experiences and optimizes the use of limited resources.[20,21]

The sample targeted dyads that included patients aged ≥ 65 years and their caregivers. These dyads were drawn from a total of nine acute inpatient units, which collectively covered 24 medical and surgical specialties/subspecialties. These units were actively involved in initiatives aimed at establishing an age-friendly health system during the study period.

The initial eligibility screening for interview participation was conducted by a geriatric internal medicine physician in cases where attending physicians had requested a geriatric care consultation. The inclusion criteria were the capability and willingness to communicate their experiences and perceptions verbally. Additionally, a prerequisite is that the dyad comprises a patient and caregiver who share a family relationship. The reason for restricting

the definition of a caregiver to a family relationship is because in Korea, most non-family caregivers are often professional caregivers employed by specialized agencies. This can result in a lack of rapport with the patient or significant individual differences in experiences related to the caregiver role for older patients. The exclusion criteria included cognitive impairments such as dementia, reduced responsiveness, very severe frailty or terminally ill (clinical frailty scale 7 or 8).

Data collection

The interviews were conducted with participating dyads to collect data. Most of the reasons for non-participation were apprehensions about the burden caused by patient participation in the interview. Each patient and caregiver dyad participates together in a single interview. Participant recruitment continued until reaching a stage of data saturation. Each interview session lasted from half to one hour.

In-depth interviews were conducted by a moderator who was a geriatric researcher analyzing a preceding qualitative study investigating the unmet needs and barriers of older inpatients using a qualitative focus group design.[18]

To ensure a comprehensive exploration of relevant subjects, a semi-structured interview guide was employed. The guide was developed based on the AFHS framework and the 4Ms, incorporating open-ended questions that delved into the participants' experiences and viewpoints on hospital care for older adults. Interviews were conducted in the patient's hospital room. The interviews were conducted in Korean and audio recorded, with participants providing written consent for the recording process.

The interview protocol included introductory questions regarding the chief cause of admission and the initial impressions of the older individuals. Subsequently, the interviews advanced to transition and key questions (listed in **Table 1**), which aimed to provide insight

into the unmet needs of older patients from the participants' experiences and perspectives (main research objectives).

Data analysis

The interviews were recorded in audio format and transcribed verbatim. These transcriptions were thoroughly reviewed to ensure accuracy and were cross-checked against the original audio recordings. For data analysis, a thematic analysis approach was employed, a qualitative content analysis method that involved coding and categorizing transcripts based on themes relevant to the research questions. The analysis was carried out independently by two geriatric researchers. Any differences in coding were resolved through discussion, and a consensus was reached. Thematic analysis followed the framework method, a systematic and rigorous approach to analyzing qualitative data.[22,23]

The transcription process was assisted by an AI-based speech recognition application called the CLOVA Note beta version (Naver Corp., Korea). We also made use of Microsoft Excel Office 365 (Microsoft Corp., Redmond, WA, USA) for charting descriptive code (initial cording), indexing, categorizing, and creating core thematic phrases (final cording).

Framework analysis

Thematic analysis, specifically employing the deductive approach known as framework analysis, served as the primary method for analyzing the qualitative research data gathered from the interviews. The AFHS 4M framework provided the guiding structure for this analysis.[22,23]

The framework analysis process encompassed five primary phases. In the initial "Familiarization stage," the researchers acquainted themselves with the data by reviewing interview transcripts and identifying potential themes. During the subsequent "Identification of

the thematic framework" phase, significant themes, topics, or points discussed in the transcripts were recognized and assigned specific codes or labels to capture their essence. The interview topic guide served as the foundation for creating overarching categories, and any emerging themes from the interviews were coded in response to pertinent questions.

Subsequently, during the "Indexing stage," codes that exhibited similarities or consistencies were clustered and named appropriately. The "Charting stage" involved reorganizing the data and thematic framework to establish a coherent structure and synthesizing the final coding framework through abstraction. Ultimately, in the "Mapping/interpretation stage," the data were interpreted, leading to the development of a narrative or storyline that elucidated the findings in connection to the research inquiries. The patterns and themes that surfaced from the data were recognized and leveraged to formulate recommendations for addressing the unmet requirements of older patients.

Through this comprehensive thematic analysis approach, the researchers successfully gleaned insightful perspectives from the interview data and drew pertinent conclusions to guide forthcoming actions and enhance healthcare for older patients.

Ethical considerations

The study was approved by the Institutional Review Board of Asan Medical Center. Prior to participating in the interviews, all participants provided written informed consent (IRB No. 2021-1485). The informed consent process included explicit permission for the publication of anonymized responses, ensuring the confidentiality and privacy of participants.

Throughout the study, confidentiality was rigorously upheld and any identifying details were carefully excluded from the transcripts before conducting the analysis. This precautionary measure was taken to safeguard participants' anonymity and privacy by complying with ethical research standards.

Table 1 Key questions included in the interview

Category	Question
Opening question	'We are planning to implement an age-friendly health system in our hospital. In this interview, we would like to hear various opinions about existing barriers and unmet needs of older adults in hospitals. First, please introduce yourself one by one including chief admission cause.' 'What is the impression that comes to your mind most commonly about older adults?' 'Today we will talk about various challenges older patients and caregivers face during hospitalization. The interview is expected to take approximately 30 minutes to 1 hour.' 'Your participation in this interview will help in improving healthcare for older adults. Even if it is not a refined expression or an academic answer, it is enough, so I would appreciate it if you felt at ease and answer according to your thoughts and feelings about the topics.'
What matters domain	'In terms of healthcare, what is your top priority requirement?' 'What do you think is the most important factor for older people to utilize healthcare services?' 'What are the biggest hurdles for older adults accessing healthcare?'
Mentation domain	'What do you personally find challenging in communicating with medical staff?' 'Have you encountered problems in communicating with medical staff?' 'What are the mental health issues faced by older people?'
Medication domain	'What are the major issues in medication administration among older adults?' 'When caring for older patients, what is the most challenging aspect of medication management?'
Mobility domain	'What is the key point in the mobility domain?' 'What challenges have you experienced in the area of mobility?' 'What do older patients need in the area of mobility?'
Open-ended question	'What are some other important issues or unmet needs for older patients and caregivers?

Results

Participant characteristics

Data saturation took place in the 6th interview. Twelve patients and their caregivers participated in interviews. The average interview duration was approximately 40 min. Among the six patients, four were female and among the six caregivers, five were female. The mean age of the patients was 77.7 years, while that of the caregivers was 52.7 years. One-third of the patients were admitted to the surgical department, whereas the rest were admitted to the internal medicine department. The average Clinical Frailty Scale (CFS) score for the patients was approximately 5.8 (details in **Table 2**).

Existing unmet needs and barriers – 4Ms Framework analysis

The 4Ms framework was applied to identify unmet healthcare needs and barriers for older adults through a thematic framework analysis of the in-depth interviews (see **Tables 3** and **4**). Through the analysis process, the interview data were categorized into the four domains of the 4Ms and summarized, eventually creating key themes.

Table 2 Participant characteristics

Interviewee dyad	Patient/ Care-giver	Mutual cohabitation status / Role relationship of caregiver to patient	Sex	Age group	Department of admission	Educational level	Clinical Frailty Scale
Dyad 1	Patient (1P)	Yes	M	65-74	Surgical	University graduate	7
	Care-giver (1C)	Yes / Spouse	F	65-74	Surgical	University graduate	2

Dyad 2	Patient (2P)	Yes	F	85-	Internal medicine	Primary school graduate	7
	Care-giver (2C)	Yes / Adult child	F	-54	Internal medicine	University graduate	1
Dyad 3	Patient (3P)	No (Single-person household)	F	65-75	Internal medicine	Primary school graduate	7
	Care-giver (3C)	No / Adult child	F	-54	Internal medicine	University graduate	1
Dyad 4	Patient (4P)	No (Two-person household)	F	75-84	Internal medicine	Primary school graduate	6
	Care-giver (4C)	No / Adult child	F	-54	Internal medicine	University graduate	1
Dyad 5	Patient (5P)	No (Single-person household)	F	75-84	Internal medicine	Secondary school graduate	3
	Care-giver (5C)	No / Adult child	F	55-64	Internal medicine	University graduate	1
Dyad 6	Patient (6P)	No (Two-person household)	M	75-84	Surgical	Primary school graduate	5
	Care-giver (6C)	No / adult child	M	-54	Surgical	University graduate	1

Table 3 Existing unmet needs and barriers identified using the 4Ms Framework analysis (What matters/ Mentation)

4Ms	Subdomain	Existing unmet needs and barriers (Exemplary quotes)
What matters	Variety of priorities in medical care service utilization	"I believe that the majority of people aspire to live a comfortable life without suffering or pain and wish to peacefully conclude their lives, rather than merely seeking to prolong their lifespan[1P]." "I was admitted to the hospital due to concerns expressed by my family caregiver, but I do not wish to undergo aggressive inpatient treatment. I merely wanted to regain my strength [2P]."
	Difference in the complexity of demands according to the vulnerability of the older person	"Physically frail older patients with reduced mobility consider the physical accessibility of medical facilities to be of paramount importance [5P]." “Older adults who do not have sufficient family care require social care support... I didn't realize it before, but now that I am getting older, when I see the old adults, it feels like looking at my own future... I also start to feel a bit anxious about whether I will receive sufficient social protection [2C].”
	Universal demand for treatment goal in older persons	"In my case, since my early 60s, I've designated a local clinic to receive medical treatment. So, if I catch a cold or experience any health issues, I go to that clinic for treatment. I think it's much more beneficial for older patients to have a comprehensive clinic designated for regular outpatient care like this. That's what I believe [1P]." "When older patients are discharged, providing more specific advice on how to lead their daily lives would be beneficial. For example, giving concrete examples of the type of lifestyle they should adopt or providing specific guidance on exercises they can perform [2C].
Mentation	Communication barriers from patient-related factors and the resulting secondary issues	"The older adults, due to physical changes such as slowing down and declining hearing, find it difficult to understand instructions and carry them out in their actions [1C]." "I don't express my pain and discomfort well... I feel sorry for causing inconvenience to my sons and daughters [5P]."
	Preferred Communication Styles for the older adults	"Even if I hear explanations about illnesses, I tend to forget them, so it would be nice to have a way to review them later [6P]." "Older patients also have a desire to understand their illnesses. However, despite this, they often

		find it difficult to grasp complex information within limited time and end up giving up [6C]."
	Unmet Needs in the Mental Health of the older adults	"I feel pathetic about myself. It's because I feel like I've already lived my whole life ... I feel sorry because I think I'm causing trouble for my sons and daughters [5P]." “A significant number of older patients come to the hospital for treatment in order to address their health-related anxieties [6P].”

Table 4 Existing unmet needs and barriers identified using the 4Ms Framework analysis (Medication / Mobility)

4Ms	Subdomain	Existing unmet needs and barriers (Exemplary quotes)
Medication	Barriers to adequate and safe medication use of older persons - Aspects of patient related factors & medication characteristics	"In the case of older patients, as the duration of illnesses tends to be long, the period of medication consumption is also extended...older patients are also vulnerable to the side effect of medications [4P]" "Powdered medications are difficult to consume due to their unpleasant taste. On the other hand, tablet medications are too large, making them difficult to swallow [3P & 3C]"
	Barriers to adequate and safe medication use of older persons - Aspects of institutional factors (healthcare system factors)	"In the case of the older person, when changes are made to their medication prescriptions, they often struggle to understand and remember, even if the medical staff explain on the spot [3C]." "The system of prescribing medication across multiple medical institutions has led to an increase in the number of medications being prescribed [5C]"
	Prescribing cascade & Polypharmacy issues	"Frail older adults seem to have experienced situations where taking one medication leads to various side effects, causing the emergence of additional symptoms and the subsequent addition of more medications. As a result, patients appear to become even more frail [4C]." "Whenever I experience additional small symptoms, the doctor keeps adding more medications, and as a result, the number of medications gradually increases. However, now I feel like I have too many medications, and I'm starting to wonder if it's really necessary to take all of them [5P]."
Mobility	Strong demand for mobility improvement and the limitations of rehabilitation therapy during hospitalization	"I wanted to regain my energy first, and exercising was very difficult. It was so strenuous that I ended up lying down often. My body feels heavy. It seems like I should exercise continuously [2P]." "There have been instances where, upon inquiring about hospitalization solely for rehabilitation purposes, the hospital rejected me by stating that I am not eligible [6P]."
	Lack of transitional rehabilitation facilities for post-discharge mobility recovery	"In my mother's case, she was discharged shortly after surgery without any period for rehabilitation. For the older patients, it seems like observing their condition for around 2 weeks after surgery and providing rehabilitation would be necessary, but I feel that secondary care is lacking [4C]."

		"It's difficult to find facilities for post-discharge rehabilitation, and there's also a lack of information about such options. Moreover, even when looking for rehabilitation hospitals, there have been cases where it's challenging to access them due to medical insurance criteria [1P]."
	Institutional and environmental barriers that make mobility challenging for the older patients	"I have frequently visited the tertiary hospital, but I always end up wandering around. Even with signs, there are times when it's difficult to find [1P]." "The situation where a hospital structure that older patients cannot navigate on their own has already been in operation is, in a way, at the heart of the issue [6C]."

‘What matters’

The ‘What matters’ domain includes key themes concerning the health outcome goals and care preferences of older adults. Within this domain, the core concepts analyzed under analysis include a spectrum of primary priorities in medical care service utilization, differences in the complexity of demands according to the vulnerability of older persons, and the universal demand for treatment goals in older persons.

The participants showed a variety of priorities in medical care service utilization. One participant said, "I believe that the majority of people aspire to live a comfortable life without suffering or pain and wish to peacefully conclude their lives, rather than merely seeking to prolong their lifespan [1P].” Another participant stated that she was admitted to the hospital because of concerns expressed by her family caregiver but did not wish to undergo aggressive inpatient treatment. She wanted to regain her strength [2P]. Additionally, some participants expressed a preference for prevention-focused medical services over treatment-focused services. For some older patients, addressing their health-related anxieties and concerns held primary importance. They expressed a desire for optimistic care plans and emotional support to help them cope with their illness. One participant said, “A considerable portion of the reasons for visiting hospitals is driven by feelings of anxiety [6P].” Similarly, some participants prioritized emotional or spiritual support (religious support).

It is important to note that the complexity of demand differs based on the vulnerability of older persons. Various aspects of vulnerability can influence the major demands and requirements for the utilization of healthcare services by older adults. Some older adults may be significantly influenced by their physical and mental vulnerabilities. One patient cited, "As I age, everything seems to wither away... I wish I could have more energy, but my vitality just doesn't seem to recover [2P]." One caregiver said, “As my mom ages, her legs are also in pain... It's challenging for her to move around [3C].” Owing to these factors, one participant argued that physically frail older patients with reduced mobility consider the physical

accessibility of medical facilities to be of paramount importance [5P]. Economic vulnerability is a significant issue for some older adults. One participant expressed anxiety about economic issues, particularly regarding unemployment situation [6P]. Another participant acknowledged, “This country has made significant progress in welfare policies, but many older people still feel economic burdens. Introducing burden-relief systems to assist these individuals is necessary [1C]." Some participants highlighted the importance of their vulnerability to social support. A participant cited, “Older adults who do not have sufficient family care require social care support... I didn't realize it before, but now that I am getting older, when I see the older adults, it feels like looking at my own future... I also start to feel a bit anxious about whether I will receive sufficient social protection [2C].” She mentioned that older patients may experience social isolation and loneliness owing to hospitalization.

In addition, there is a universal demand for treatment goals in older individuals. Older, frail adults have a high prevalence of multimorbidity. They not only experience the occurrence of new diseases but also the worsening of existing diseases. Considering these points, it is evident that an integrated healthcare system is in greater demand for older patients than a disease-centered fragmented medical system. For example, one noted that “As time goes by and as one ages, various phenomena tend to appear in old age…In my case, since my early 60s, I've designated a local clinic to receive medical treatment. So, if I catch a cold or experience any health issues, I go to that clinic for treatment. I think it's much more beneficial for patients to have a comprehensive clinic designated for regular outpatient care like this. That's what I believe [1P].” In older adults, the duration of illness and treatment periods tended to be longer for many diseases. Therefore, these patients require long-term management and care after acute treatment. In particular, there is a significant demand for post-discharge education and guidance to ensure proper self-management and understanding of patients’ health conditions. Participants argued that this helped them cope with their conditions effectively and minimized the risk of complications or readmissions. Another universal demand

in the hospitalization of older adults is the essential need for caregiving resources. For frail older persons, self-care becomes challenging, leading to the necessity for 24-hour caregivers. One caregiver noted that “Sons and daughters cannot be constantly by the patient's side. They also need to maintain their social lives [4C].” One participant cited, “I also feel sorry for asking my daughter for caregiving help [5P]."

Based on the results of the in-depth interviews in this domain, the most critical unmet needs and barriers concerning the ‘What matters’ for older adults primarily relate to the inadequate consideration of the various demands stemming from individual vulnerabilities among older patients. There is also a noticeable absence of an approach to address their individualized top-priority demands. These findings underscore the need for a patient-centered healthcare system rather than a disease-centered approach. Additionally, the universal demands of older patients for an integrated healthcare system rather than a specialty-oriented approach, chronic disease management, and the availability of caregiving resources also need to be addressed.

‘Mentation’

The ‘Mentation’ domain consists of themes related to communication issues in older adults and mental health problems such as depression and cognitive disorder. The key themes within this domain have been categorized as follows: communication barriers arising from patient-related factors and the resulting secondary issues, the preferred communication styles for older adults, and unmet mental health needs in the older adult population.

Communication barriers stemming from patient-related factors result in secondary issues. Frail older adults often encounter difficulties in communication owing to increased physical and mental vulnerabilities. One participant noted that due to physical

changes such as slowing down and declining hearing, older adults find it difficult to understand instructions and carry them out in their actions [1C]. Another one mentioned, " I feel that the medical staff sometimes speak too quickly, making it difficult for me to understand, and not only that, but I also tend to forget things even if I hear them (6P)." One participant mentioned that older adults are prone to receiving criticism for their communication issues, and when they receive such criticism, it further demoralizes them, making communication even more difficult [1C]. Some participants pointed out that due to communication challenges in older persons when instructions for actions are not effectively communicated, they often rely on physical assistance. The reliance on physical assistance can increase the risk of physical abuse. Such physically coercive behaviors can cause older adults to become demoralized and more susceptible to emotional wounds. Due to communication barriers, some older individuals rely heavily on and delegate most of their communication to caregivers. However, in such patient-caregiver relationships, the patient may not adequately express their needs because of feelings of guilt towards the caregiver. One participant stated, "I don't express my pain and discomfort well... I feel sorry for causing inconvenience to my sons and daughters [5P]."

Older adults preferred different communication styles. They desire empathetic conversations and simple explanations. They also want ample time to communicate. One participant emphasized that young people often struggle to understand the suffering of older patients. This makes her think that young people might only comprehend such situations once they grow older [5P]. Another participant pointed out "Even if I hear explanations about illnesses, I tend to forget them, so it would be nice to have a way to review them later [6P]." Participants mentioned that they wanted clear information about the outcomes, regardless of the success of the disease treatment. For example, "I don't feel good after hearing ambiguous explanations [6P]," "Older patients also have a desire to understand their illnesses. However, despite this, they often find it difficult to grasp complex information within a limited time, and

end up giving up [6C]."

The unmet mental health needs of older adults have also been emphasized. Participants mentioned that vulnerable older individuals are more prone to experiencing emotional depression. One participant cited that, "I feel pathetic about myself. It's because I feel like I have already lived my whole life ... I feel sorry because I think I am causing trouble for my sons and daughters [5P]." Some participants believed that mobility impairment negatively affected their mental and emotional well-being. Another participant mentioned that a significant number of older patients visit the hospital for treatment to address their health-related anxieties [6P].

The findings within the ‘Mentation’ domain highlight the critical importance of understanding the physical and mental vulnerabilities that underlie communication barriers in older individuals. Furthermore, they underscore the significance of preventing secondary issues, such as abuse of older people, that can arise from communication obstacles. To achieve this, implementing communication methods that are simple, empathetic, and allow sufficient time to align with the preferred approaches of older persons is crucial. Additionally, it reveals the need for adequate attention to mental health concerns such as depression and anxiety in older persons.

‘Medication’

The ‘Medication’ domain encompasses themes related to age-friendly medication use. Within this domain, the interview data were classified into following categories: barriers to the appropriate and safe use of medications by patient-related factors and medication characteristics, institutional factors (pertaining to the healthcare system), and concerns related to prescribing cascades and polypharmacy.

Patient-related factors and medication characteristics may contribute to difficulties in ensuring adequate and safe medication use. Participants indicated that older adults face difficulties in medication intake owing to various vulnerabilities, such as physical and cognitive challenges. In addition, the characteristics of medications, including their administration instructions and packaging methods, have contributed to these challenges. One caregiver noted, “After this admission, I checked and found out that my mom had missed taking some of her medication. Sometimes, when I clean at home, I come across pills in places where my mother might have taken her medicine [2C]." Participants cited that vulnerable older adults often have many illnesses, resulting in a high number of medications they need to take. Furthermore, not only is the frequency of medication intake high, but it is also difficult when the dosage is substantial. Another comment was added as follows: "In the case of older patients, as the duration of illnesses tends to be long, the period of medication consumption is also extended... Older patients are also vulnerable to the side effects of medications [4P]." The participants pointed out issues related to the characteristics of medications, such as administration instructions and packaging methods. One participant noted “When there are multiple packets of medication, it becomes confusing to take them. Even though the instructions for how to take the medication are written on the packets, it is difficult to understand in practice. It would be helpful if the instructions could be explained more simply [6P]." Most participants argued that the current generalized medication packaging method was inconvenient for older adults. Some have mentioned that the packaging method of multiple pills tied together in a single pouch is inconvenient for older adults. One participant indicated that since many older individuals have reduced dexterity, there is a higher likelihood of losing pills while attempting to remove them from the packaging [2C]. Furthermore, dyad participants expressed, "Powdered medications are difficult to consume due to their unpleasant taste. On the other hand, tablet medications are too large, making it difficult to swallow [3P and 3C].”

In addition, institutional factors (healthcare system factors) may contribute to difficulties with proper medication use among older patients. One participant stated “In the case of older persons, when changes are made to their medication prescriptions, they often struggle to understand and remember, even if the medical staff explains them on the spot. Furthermore, even if caregivers attempt to comprehend it later, it is challenging to understand the reasons for these changes. Moreover, if caregivers change, the situation becomes even more complicated [3C]." One participant stated that the system of prescribing medications across multiple medical institutions led to an increase in the number of medications prescribed [5C]. For these reasons, the participants pointed out that frail older persons require monitoring of the actual medication administration process because they find it difficult to comprehend medication instructions. They emphasized that a filtering system for redundant medications was also required.

Prescribing cascades and polypharmacy issues are crucial topics in age-friendly medication use for older patients. Prescribing cascades occur when the initial drug given to a patient causes an adverse drug event, which is misinterpreted as a new medical condition, resulting in the prescription of additional medication. As one participant noted, "My mother is taking medication for rheumatic disease, and because of that, her immune system has weakened, making her susceptible to catching colds. So, she is currently taking cold medicine, and while taking that, her stomach hurts, leading her to take medication for her stomach as well. No matter how much I think about it, I don't see any room for improvement in this situation...[4C]." Participants agreed that frail older adults often find themselves in situations where taking one medication leads to various side effects, triggering the emergence of additional symptoms and the subsequent prescription of more medications. They believed that older patients become even more vulnerable due to prescribing cascades.

Additionally, interviews highlighted polypharmacy as a significant concern. One participant mentioned, "Whenever I experience additional minor symptoms, the doctor keeps

adding more medications, and as a result, the number of medications gradually increases. However, now I feel like I have too many medications, and I'm starting to wonder if it's really necessary to take all of them [5P]." Another participant noted, "When I looked at the ingredients of the prescribed medications for my father, I noticed that there were quite a few duplicates... In cases where he had to swallow multiple pills at once, there were as many as 10. I believe it's necessary to eliminate duplicate medications [6C]." Participants aimed to reduce the medication burden for older patients and sought organized prescriptions tailored to individual circumstances."

When analyzing these findings in the 'Medication' domain, the unmet needs and barriers that should have been addressed included challenges related to older adults' vulnerabilities and inconvenient aspects of medication characteristics. The lack of an easily accessible prescription monitoring system and management of prescription cascades and polypharmacy have also been emphasized.

'Mobility'

The 'Mobility domain encompasses key themes related to individualized mobility plans and the establishment of clinical environments that facilitate mobility. Unmet needs and barriers were analyzed and categorized into three subdomains: strong demand for mobility improvement and limitations in the application of rehabilitation therapy during hospitalization; lack of transitional rehabilitation facilities for post-discharge mobility recovery; and institutional and environmental barriers that make mobility challenging for older patients.

Unmet needs and barriers underscore the significant desire of older adults for mobility enhancement, alongside constraints in the implementation of rehabilitation treatment during hospitalization. The participants mentioned that although older adults desire physical activity, they perceive exercise as a hurdle. One participant said, "I wanted to regain my energy first, but exercising was very difficult. It was so strenuous that I often ended up lying

down. My body feels heavy. It seems like I should exercise continuously [2P]." Another study noted that "While encouraged to engage in walking exercises with a walker, older patients seemed to avoid it because of the numerous obstacles in their way, making it more difficult for them to move around. It would be great to have rehabilitation exercise equipment such as a stationary bicycle available indoors during hospitalization [2P]." Most participants expressed the opinion that concurrent rehabilitation therapy during hospitalization would be beneficial: "It would be great if the rehabilitation therapy team could come for about 30 min a day to exercise with the patient…Of course, it might be impossible due to the patient's functional condition. There are limitations due to pain as well [4C]." Participants mentioned that the conditions for receiving rehabilitation therapy were stringent, making it difficult for them to access the benefits. One participant cited that “There have been instances where, upon inquiring about hospitalization solely for rehabilitation purposes, the hospital rejected me by stating that I am not eligible [6P]." Another participant mentioned, "It would be great if, during hospitalization, patients could be classified based on their medical conditions and receive proper rehabilitation guidance so that a structured system is in place for them to engage in exercise, even if only to a small extent [5C]."

The participants pointed out that there is a lack of subacute and chronic care facilities for older persons to undergo rehabilitation for various reasons after the acute phase of treatment has been concluded. One participant noted “In my mother's case, she was discharged shortly after surgery without any period for rehabilitation. For older patients, it seems like observing their condition for approximately two weeks after surgery and providing rehabilitation would be necessary, but I feel that secondary care is lacking [4C]." Another study noted that “It is difficult to find facilities for post-discharge rehabilitation, and there is a lack of information regarding such options. Moreover, even when looking for rehabilitation hospitals, there have been cases where it is challenging to access them due to medical insurance criteria [1P]." As a caregiver, one participant recounted his experiences as follows:

"My father recently underwent surgery, and I also tried to find rehabilitation facilities on my own, but not much information was available, making it difficult to find options. Even as a relatively young person, I struggled to find them, so I can imagine it is even harder for older individuals. [6C]

Institutional and environmental barriers contribute to mobility difficulties in older patients. Participants pointed out that many design structures in hospitals are difficult for older people to use. One participant noted "I have frequently visited the tertiary hospital, but I always end up wandering around. Even with signs, there are times when it is difficult to navigate [1P]. Another participant mentioned that "The surrounding spaces, such as parking lots, around the hospital also need sufficient equipment like wheelchairs to assist with mobility for visiting the hospital [3C]." One participant suggested that guidance and education regarding mobility-assistive devices that can be used during hospitalization, such as wheelchairs or walkers, are necessary [4P]. Furthermore, participants pointed out that the core issue lies in the fact that there is already a hospital structure in place that older patients cannot navigate independently.

Upon analyzing the interview data pertaining to the 'Mobility' domain, it became evident that the most significant unmet needs and barriers were prominent. Despite the considerable desire for improved mobility among older adults, limitations in the provision of rehabilitation therapy during hospitalization and the inadequacy of post-acute rehabilitation facilities upon discharge from acute care settings were notable challenges. Furthermore, there was a clear need for age-friendly facility designs that enable older patients to use them independently, reducing their reliance on external assistance.

Discussion

This study aimed to identify key themes related to unmet needs and barriers in older adults' inpatient care using the 4M framework (What Matters, Mentation, Medication, and Mobility). The results of this study indicate the need for individualized and patient-centered healthcare systems to improve hospital care for older adults. Furthermore, this study highlights the importance of understanding the physical and mental vulnerabilities inherent in communication barriers for older persons. It also addresses various barriers to older adults' medication use, such as the prescribing cascade, polypharmacy, and lack of a prescribing monitoring system. With regards to the mobility of older patients, the study highlighted the demand for concurrent rehabilitation during hospitalization, inadequate availability of post-acute rehabilitation facilities, and age-friendly facility designs.

These findings are consistent with the previous focus group interview (FGI) study which involved healthcare providers and employees participating to uncover unmet needs and barriers in older adults' inpatient care.[18] Similar to the present research, the previous FGI study also focused on the heterogeneities in the pattern of care demands among older adults within the 'What matters' domain. This confirms the importance of a patient-centered and coordinated care approach that considers the distinct needs and preferences of each older patient rather than relying solely on a disease-centered healthcare system.

Interestingly, concerning unmet needs and barriers in the 'Medication' domain, it is noteworthy that a common perception regarding prescribing cascade, polypharmacy issues, and the lack of a prescribing information sharing system was identified among patients and caregivers in the In-depth interviews, as well as among healthcare providers and employees in the FGI study. On the other hand, while the previous FGI study exclusively focused on delirium, a mental disorder, within the 'Mentation domain' of older adults, this study emphasized vulnerabilities related to older adults' mental health, including depression and anxiety disorders. It also highlights potential communication barriers for the older patients.

These findings imply that since the ‘Mentation’ domain involves mental aspects, it is particularly important to understand the inner feelings that are directly expressed through the voices of patients and caregivers.[24,25] In contrast, the emphasis on fall prevention and pressure sore management in the ‘Mobility’ domain in the FGI study, as opposed to the current in-depth study, could be interpreted as an indication of healthcare providers' proactive awareness towards preventable events that had not yet occurred.[26,27]

The research findings on "What matters" to hospitalized older patients indicate the need for patient-centered treatment goals. For patient-centered approaches, healthcare professionals must share information about treatment plans with patients and their caregivers.[28,29] Moreover, it is crucial to provide clear information about treatment outcomes and prognosis to aid the decision-making process, especially for patients and caregivers with limited medical knowledge.[30]

Furthermore, the results show that what is important in the healthcare utilization of older adults can differ depending on individual vulnerabilities, including physical, mental, economic, and social support. Therefore, a screening process for vulnerabilities could help in identifying what matters to older patients during hospitalization[31]. Various tools for screening the vulnerabilities of older people are widely known.[32] Frailty can serve as a comprehensive indicator reflecting various vulnerabilities in older patients.[7] Two prominent indicators for measuring frailty are the frailty phenotype and the frailty index.[33-35] Both indicators demonstrate correlations with multifaceted vulnerabilities in the older person, such as physical, mental, economic, and social support. However, both these indicators require considerable patient information to derive their values. For instance, physiological measurements such as hand grip strength or over 30 items related to frailty are needed. This complexity renders them unsuitable for screening purposes. In contrast, the CFS, which visually assesses frailty based on an older individual's walking ability, Instrumental Activities of Daily Living (IADL), and Activities of Daily Living (ADL) impairments, can be easily taught to multiple examiners and

requires minimal patient information.[36,37]. Therefore, it is an advantageous screening tool. For these reasons, the AMCS has incorporated CFS screening as part of its efforts to create an age-friendly health system[38]. This involves establishing a process to identify highly demanding and vulnerable patients using the CFS and providing interventions in the domains of vulnerability.

However, as echoed in this study's analysis, the vulnerabilities of older patients not only play a crucial role in directing treatment goals but also significantly influence the intensity of support provided. Older patients with high medical needs often require additional care beyond the standard, potentially straining existing nursing resources. Initiatives, such as establishing dedicated teams for highly vulnerable older patients or deploying specialized geriatric nurses, can provide viable to offer the necessary support to individuals with heightened vulnerabilities.[39,40] In particular, for older patients with economic and social vulnerabilities, a multidisciplinary approach involving a social welfare team that coordinates national support and local community resources is crucial.[3,41]

The findings also highlight the inadequacy of the current fragmented healthcare system in addressing the needs of older patients with diverse medical histories and symptoms. Consequently, there is a clear call for integrated care, rather than a specialty-oriented approach, especially for frail older adults.[42] Moreover, to address the abundance of medical information from various sources due to the complexity of these patients, the development of an integrated information-sharing platform could be considered as an alternative.[43] Additionally, the development of services such as discharge education systems, hospital-at-home models after discharge, post-discharge telephone services, and collaboration with hospice institutions would aid in achieving integrated care through the management of chronic conditions following acute care.[42,44-46]

As demonstrated by the research findings concerning the "Mentation" domain, older individuals experiencing communication difficulties are at an increased risk of being exposed

to abuse, as previously highlighted. Abuse is unacceptable, and multifaceted efforts are necessary to prevent it. In particular, efforts can commence with an awareness of ageism in communication with older adults.[47] Additionally, for older patients facing communication barriers, it could be beneficial to proactively visit vulnerable older patients during their hospitalization to inquire about their chief complaints and concerns, given that they might have difficulty actively expressing their needs. To address this concern, the AMCS has implemented a process wherein specialized geriatric nurses proactively approach patients identified as highly vulnerable through CFS screening. These nurses engage in focused communication regarding the patient's chief complaints and concerns.

In the ‘Medication’ domain of older adults, addressing unmet needs and overcoming barriers necessitates the implementation of age-friendly medication guidance. Changing the packaging of medications and improving medication instructions through visually accessible materials such as clear pictorial guides could serve as potential solutions.[48-51] Furthermore, implementing a proactive screening system for prescribing cascades and polypharmacy could be beneficial for frail patients. Patients included in the screenings would have improved their medication-related issues through medication reconciliation interventions. Developing an electronic medical record-sharing program for complex prescription information of older patients, both in inpatient and outpatient settings, could be proposed.[52] This would facilitate information sharing related to potentially inappropriate medications (PIM), prescription ingredient duplications, and polypharmacy issues, thereby offering significant assistance. In particular, regarding PIMs, existing standards such as Beer's criteria and the STOPP/START criteria are widely used in inpatient care to ensure proper medication management.[53]

Early rehabilitation programs during hospitalization can serve as effective interventions for preventing complications in older patients.[3,54] In the analysis of unmet needs and barriers within the 'Mobility' domain, it was observed that older patients exhibit varying levels of physical ability, and this variability affects the suitable extent of rehabilitation program

they can undergo. Consequently, the AMCS devised a strategy that takes into consideration the CFS as a reflection of physical ability. Based on each individual's CFS score, it provided different types of rehabilitation therapy interventions to tailor the approach accordingly. For frail older patients, post-discharge rehabilitation is often required to regain mobility. However, suitable medical facilities are scarce and difficult for patients and caregivers to find. Therefore, services that connect patients to local community rehabilitation institutions upon discharge may be beneficial.

This study has several limitations. First, the sample size of 12 participants was relatively small. Therefore, generalizing the interview content of the participants to the unmet needs and barriers of older inpatients could be challenging. It is important to highlight that only one dyad in the study had a caregiver-to-patient relationship of spouse, while the rest involved adult children as caregivers. Additionally, the study did not account for differences in socioeconomic status, including variations in educational levels during the purposeful sampling process. Notably, a substantial number of participants had high scores on the clinical frailty scale, which could affect the study's findings. Nevertheless, despite these limitations, the emergence of common themes among participants and their alignment with the results of previous FGI studies suggests that, given the nature of the thematic analysis, significant topics were effectively identified and explored. Second, the in-depth interviews were conducted in a dyadic format, which could have hindered active patient expression. One participant mentioned struggling to articulate their demands due to feelings of guilt towards their adult child caregiver. Considering this, it is possible that adequate communication was not achieved during the interviews. However, this limitation is inherent in various interview studies involving both patients and caregivers, and the study's approach aimed to mitigate bias by allowing both patients and caregivers to respond to the same set of questions at least once. Notwithstanding these constraints, the outcomes of this investigation provide valuable insights into the barriers to and potential solutions for enhancing hospital care for older adults. Furthermore, they

underscore the necessity for patient-centered, well-coordinated care that considers the distinct needs and preferences of each patient.

Conclusion

In conclusion, this study has identified several key themes related to unmet needs and barriers in enhancing healthcare for older adults within the hospital environment, aligning with the 4Ms framework. According to the analysis based on the 4M framework, the primary barriers identified in the 'What matters' domain include a lack of individualized care plans and shared decision-making, which fail to account for the diverse priorities among older patients and their varying complexities. In the 'Mentation' domain, the main issues are communication barriers resulting from patient factors, leading to secondary problems and unmet needs in the mental health of older adults. Within the 'Medications' domain, the primary obstacles to providing adequate and safe pharmacotherapy encompass patient factors, medication characteristics, institutional factors, and issues related to prescribing cascades and polypharmacy. In the 'Mobility' domain, the main challenges revolve around the limitations of rehabilitation therapy during hospitalization, the absence of transitional rehabilitation facilities for post-discharge mobility recovery, and environmental barriers that make mobility challenging for older patients.

To address these unmet needs and barriers, Asan Medical Center is currently in the process of culturally embracing and gradually expanding the utilization of the 4Ms framework. Further research involving patients, caregivers, and healthcare providers is essential to validate these findings and assess the feasibility and effectiveness of incorporating the AFHS framework into clinical operations in academic hospitals in Korea.

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국문요약

본 연구는 한국의 대학병원에서 노년 환자의 입원 진료 과정에서 의료 서비스 개선을 목표로 노년 환자의 미충족 요구와 장애요인을 찾기 위한 질적 연구이다. 연구는 환자-간병인을 대상으로 비-구조화된 짝 심층 인터뷰 (semi-structured dyad in-depth interview)를 시행하였고 인터뷰 자료 분석을 위해 연령-친화 의료 시스템 4M 틀 (Age-Friendly Health System 4Ms Framework)을 이용하였다.

연구는 총 12 명의 참가자, 환자 6 명 및 가족 간병인 6 명이 한 쌍으로 짝을 이루어 총 6 회의 준비된 인터뷰에 참여했다. 환자와 간병인의 평균 연령은 각각 77.7 세와 52.7 세였고 인터뷰 시간은 평균 약 40 분이었다. 연구는 질적 보고 통합기준 연구지침 (Consolidated Criteria for Reporting Qualitative research guidelines)에 따라 시행되고 분석되었다. 인터뷰 자료 분석은 연령-친화 의료 시스템 4M 틀을 활용한 주제 틀 분석 (thematic framework analysis)으로 진행되었다. 여기서 4M 이란 'What Matters (나에게 중요한 것)', 'Mentation (마음 건강)', 'Medication (약물)', 'Mobility (이동성)'를 나타내는 용어로 연령-친화 의료 시스템의 핵심이 되는 네 가지 영역을 나타낸다.

연구는 자료 분석을 통해 노년 환자의 입원 진료 과정에 있어 다양한 미충족 요구와 장애요인을 확인하였다. 'What matters (나에게 중요한 것)'영역에서 확인된 미충족 요구와 주요 장벽은 환자 중심의 개인화된 치료 계획의 부족과 노년 환자의 다양한 우선순위와 복잡성 차이를 고려하지 못한 의사결정 과정이었다. 'Mentation (마음 건강)'영역에서 주요 장벽은 환자 관련 요인에서 비롯된 의사 소통 문제가 있었고 이로 인해 소외, 차별 등 이차적인 문제 발생이 있었다. 그리고 이 영역에서 미충족 요구로 우울 등 노년 환자의 정신 건강 문제에 대한 주의 및 관심 또한 확인되었다. 'Medication (약물)'영역의 경우 적절하고 안전한 약물 치료에 있어서 주요 장벽으로 환자 관련 요인, 의약품 특성 요인, 의료기관 및 의료시스템 요인, 처방 연쇄 및 다제약물 문제가 확인되었다. 'Mobility (이동성)'영역에서 미충족 요구와 주요 장애요인은 입원 중 재활 치료 적용의 한계, 퇴원 후 이동성 회복을 위한 이행기 재활 시설의 부족, 그리고 노년 환자가 독립적으로 이동하기 어려운 병원의 환경적 장벽이 있었다.

본 연구의 결과는 한국의 대학병원에서 노인 입원환자의 의료 서비스 개선을 위해 환자 중심의 의료 시스템, 의사소통과 정신건강에 대한 관심, 적절하고 안전한 약물사용, 이동성 회복을 위한 서비스의 필요성을 강조했다. 연구를 통해 확인된 노년 환자의 미충족 요구와 장애요인은 연령 친화적 입원 환경을 만들기 위한 기초로 활용될 수 있으며 이를 통해 더욱 환자 중심적인 의료 시스템 확립이 이루어질 것으로 기대된다.

중심단어: 노인의학, 노년내과, 연령-친화 의료 시스템, 4M 틀, 환자-중심 의료, 노인 입원환자