Health Research Policy and Systems

RESEARCH

Open Access

Development and psychometric validation of an age-friendly health system assessment tool in the Iranian context

Badriyeh Karami[1], Maryam Tajvar[2*], Abbas Ostadtaghizadeh[3] and Mehdi Yaseri[4]

Abstract

Evaluating health system interventions for elderly care necessitates a context-specific, credible and dependable instrument. This research was dedicated to creating and validating a tool to assess the health system's age-friendliness. The study unfolded in two pivotal stages: the generation of items utilizing a hybrid model and the psychometric appraisal of the tool, encompassing both validity and reliability assessments. From an initial pool of 522 items derived from a systematic scoping review and qualitative analysis, a concise assessment tool emerged, featuring 52 items across 6 domains: governance, information, resources, service delivery, community engagement and outcomes. The 52-item tool offers a straightforward, substantiated and robust means to gauge age-friendliness, pinpoint health system deficiencies and facilitate strategic planning on the basis of its insights.

Keywords Age-friendly, Health system, Assessment tool, Psychometric validation, Iran

Introduction

Population ageing is a natural and inevitable process that is occurring all over the world [1], with the proportion of individuals aged 65 years and older projected to increase from 10% in 2022 to 16% by 2050 [2]. This demographic shift is expected to intensify the prevalence of chronic diseases; [3, 4]. Current statistics indicate that 88.7% of those older than 65 years have at least one chronic condition, 71.7% have two and 3.51% have three or more. Additionally, the likelihood of health issues such as falls, Alzheimer's disease and disabilities is rising, leading to greater healthcare demands and hospitalizations among the elderly [5].

In response to these trends, the concept of an age-friendly health system (AFHS) has been introduced by international entities and health systems in countries with significant elderly populations [6]. The AFHS are designed to optimize care for older adults by reducing healthcare-associated risks and enhancing satisfaction with the care they receive. These systems strive to provide the highest value of care by proactively promoting the health and wellbeing of older individuals, addressing potential health concerns, preventing avoidable injuries and improving the quality of care for those with serious illnesses or nearing the end of their lives. Additionally, AFHS extend support to family caregivers, recognizing their crucial role in the care process [7]. The goal is to address the specific health needs of this population [8]. AFHS aim to minimize healthcare-related harm, enhance patient satisfaction and ensure the elderly receive the highest quality of care [7].

*Correspondence:
Maryam Tajvar
mtajvar@sina.tums.ac.ir
[1] Behavioral Diseases Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran
[2] Department of Health Management, Policy and Economics. School of Public Health, Tehran University of Medical Sciences, Tehran, Iran
[3] Department of Health in Emergencies and Disasters. School of Public Health, Tehran University of Medical Sciences, Tehran, Iran
[4] Department of Epidemiology and Biostatistics, School of Public Healt, Tehran University of Medical Sciences, Tehran, Iran

The initiative for AFHS is grounded in key aspects of geriatric care models, including leadership committed to ageing concerns, the application of evidence-based care, specialized training for caregivers of the elderly and effective care teams that prioritize measurable outcomes. It emphasizes a coordinated approach to care, involving collaboration with other organizations and engagement with patients, their families and caregivers [9].

Evaluating health systems for their age-friendliness and identifying factors that influence their performance is of utmost importance. This study aimed to develope and psychometrically evaluate a measurement tool specifically tailored to assess AFHS in the context of Iranian society. While previous research in Iran has explored age-friendly characteristics within specific elements of the healthcare system, such as hospitals or pharmacies, these studies employed limited checklists or researcher-devised instruments [10]. However, a comprehensive evaluation of the health system as a whole, considering the unique context of Iran, remains lacking. The existing studies have limitations, including restricted data sources, a small number of indicators and a lack of consideration for the opinions and preferences of elderly individuals in the design of measurement tools. Our study seeks to address these gaps by developing a robust and contextually appropriate assessment tool.

Methods

Study design

This exploratory sequential mixed method design was conducted in two main phases, including item generation and psychometric evaluation, which will be described in detail. For item generation, after conducting a systematic scoping review, a qualitative study was performed. In addition, in the second phase, a psychometric evaluation of the assessment tool was conducted.

Phase 1: item generation

Systematic scoping review: development of the conceptual model, themes and items

In this phase of study, for the development of the AFHS concept, according to the results of a systematic scoping review conducted on the basis of Arksey and O'Malley's model, an AFHS conceptual framework was designed, and its article was published [11]. On the basis of the results of this stage, 139 items were extracted.

Conducting qualitative study

To delineate and ascertain the concept of an AFHS, along with its domains and components within Iranian society, a qualitative study employing content analysis was undertaken in 2021. This phase adhered to the guidelines proposed by Graneheim [12]. Interviewees were chosen through purposeful sampling, and the interviews were carried out and recorded. Subsequent to the extraction of semantic units, a deductive classification was applied, anchored in the conceptual framework established in the preceding phase. The procedural steps of the qualitative study are outlined below:

Study participants

The concept of an AFHS is inherently complex and requires a multidisciplinary approach. To thoroughly explore this concept and its facets, it was essential to select interviewees capable of covering all domains and components. Initially, the research team developed guidelines for conducting the interviews, which were then carried out as semi-structured, in-depth discussions with both experts in Iran's health system and older adults. The experts chosen for this study were seasoned professionals with extensive knowledge and experience in gerontology and the health of older adults. Input was sought from specialists across various sectors, including the Geriatric Health Department of the Ministry of Health, academic institutions with geriatric disciplines (e.g. geriatric medicine, nursing and gerontology) and individuals involved in planning for the elderly. Additionally, contributions were gathered from experts at health centres in Tehran and other universities, policy-makers from the Ministry of Health and health centre managers. A systematic and intentional sampling method was employed to select these experts, whose ages ranged from 40 to 70 years and whose healthcare experience spanned 12–30 years. Specifically, the distribution of work experience among the interviewees was as follows: three individuals with 12 years, two with 15 years, one with 13 years, two with 16 years, one with 18 years, two with 20 years and one with 30 years of experience. Furthermore, 10 older adults from the community, aged between 61 and 85 years, were also interviewed to provide a comprehensive perspective.

Data collection and processing

To ensure uniformity in data collection and interviewing, the research team crafted a guide with specific questions. This guide underwent expert review to confirm its validity. The initial interview was conducted as a pilot, overseen by a professor experienced in qualitative research. Once the guide, questions and interviewees were finalized, interviews were arranged and carried out in adherence to interviewing principles, such as clarifying study goals, maintaining confidentiality, securing consent and respecting participants' time. Expert interviews were both in-person and virtual, lasting between 45 and 70 min. For elderly participants, interviews took place in open, public settings and were shorter, ranging from

20 to 45 min, to accommodate their needs. The process continued until data saturation was achieved, meaning no new information was gleaned from additional interviews, a state referred to as "informational redundancy" [13]. This is when interviewers consistently hear the same feedback from participants [14]. Each interview was transcribed and coded immediately, resulting in 383 distinct codes. The demographic details of the experts and older adults, all of whom contributed to the full psychometric validation, are outlined below in Tables 1 and 2:

Table 2 Demographic characteristics of older people who participated in the interviews

Characteristics		*N* (%)	Total (%)
Gender	Female	1 (10%)	10 (100%)
	Male	9 (90%)	
Education	BSC	4 (40%)	10 (100%)
	Diploma	3 (30%)	
	Under diploma	3 (30%)	
Job status	Non-employment	3 (30%)	10 (100%)
	Retired	7 (70%)	

Data analysis

Data collection and analysis were conducted concurrently. Following Graneheim's qualitative research guidelines, the transcribed interviews were meticulously examined to extract semantic units. Each unit was then recoded and assigned a unique code. These codes were subsequently grouped by identifying similarities, aligning them with the previously established conceptual framework. To ensure the codes' validity and reliability, they were validated with select interviewees and independently reviewed by two researchers.

Integration of the results of qualitative and quantitative stages (pool items)

In this phase, the item pool was created by integrating indicators from the scoping review and qualitative study. Some indicators were similar or merged, suggesting the potential for further refinement. The goal was to eliminate duplicates to form a unique, non-repetitive set of indicators. The draft tool underwent multiple reviews by the research team and experts, who consolidated overlapping questions. After incorporating feedback and making necessary adjustments, the research team approved the initial version of the tool. Consequently, a preliminary assessment tool with 128 questions was established to evaluate the AFHS. The subsequent steps will involve assessing the tool's validity and reliability.

Phase 2: psychometric evaluation

Face validity

The face validity of the AFHS assessment tool was scrutinized through both qualitative and quantitative lenses. For the qualitative aspect, drafts were disseminated to 20 experts across various fields for feedback on each item's clarity, relevance and potential for confusion. Their insights led to subsequent revisions.

Quantitatively, the impact score (IS) for each item was determined. The same panel of experts rated the significance of each item on a scale from 1 (strongly disagree) to 5 (strongly agree). The IS was then computed using the formula: impact score = frequency (%) × importance [15]. An IS exceeding 1.5 was deemed acceptable [16].

Content validity

To ascertain the content validity of the AFHS assessment tool, a blend of qualitative and quantitative methods was employed. Initially, 20 specialists critiqued the grammar, phrasing, item placement and scaling for qualitative

Table 1 Demographic characteristics of experts who participated in the interviews

Characteristics		*N* (%)	Total (%)
Gender	Female	3 (25%)	12 (100%)
	Male	9 (75%)	
Education	GP (MPH)	1 (8.3%)	12 (100%)
	PhD	11 (91.7%)	
Field of knowledge	Healthcare management	5 (41.7%)	12 (100%)
	Health in emergencies and disaster	1 (8.3%)	
	Health economist	1 (8.3%)	
	Health policy-maker	2 (16.7%)	
	Geriatric nursing	1 (8.3%)	
	General practitioner (geriatric MPH)	1 (8.3%)	
	Laboratory sciences	1 (8.3%)	

content validity [17]. Their feedback prompted revisions to each item. For quantitative content validity, the content validity ratio (CVR) and content validity index (CVI) were calculated. The CVR was determined by asking specialists to rate each item's necessity on a 3-point scale, with the formula:

$$CVR = (nE - N/2)\% N/2$$

where *nE* is the number of experts who labelled an item as Essential, and *N* is the total number of experts [18]. A CVR of 0.42 or higher is considered satisfactory for 20 specialists [19]. For the CVI, experts rated each item's relevance on a 4-point scale. The CVI was computed by dividing the sum of relevant but needs revision and completely relevant scores by the number of experts. A CVI score above 0.79 indicates acceptable content validity [20].

Participants and setting

Given the specialized nature of the AFHS assessment tool, it was administered to a select group of 20 health system managers. These individuals were chosen from various departments, including senior positions such as the vice president of treatment, deputy of health, deputy of development and human resources and directors of the health deputy focussing on elderly health at the Ministry of Health. Additionally, representatives from the Secretariat of the National Aging Council, Welfare Organization and insurance organizations were included. The questionnaire was presented in person at the offices of these managers, who were then asked to evaluate each question using a Likert scale ranging from 0 to 10.

Reliability

The reliability of the AFHS assessment tool was evaluated by using the test–retest stability approach with the Wilcoxon test. Accordingly, 20 specialists were asked to complete the assessment tool twice with a 2-week time interval. Then, the interclass correlation coefficient (ICC) was calculated. ICC values greater than 0.4 [21] and greater than 0.7 were considered acceptable.

Results

Phase 1: item generation

From the initial 522 codes – 139 from the scoping review and 383 from qualitative interviews – a reduction process was undertaken to eliminate duplicates and merge similar items. Expert feedback helped narrow down the pool to 159 unique, non-repetitive indicators, resulting in a tool with 224 distinct indicators. The draft underwent multiple reviews by the research team and experts, who consolidated items with overlapping meanings. This collaborative effort led to a consensus on the tool's content, aligning it with the AFHS conceptual framework. The finalized tool, comprising 128 items, was now ready for psychometric evaluation.

Phase 2: psychometric evaluation

Face validity

The initial assessment tool, featuring 128 items, was presented to 20 experts who had contributed to the foundational conceptual framework. They were requested to evaluate the items for clarity, simplicity and understandability, as well as their organization within the tool. Following their feedback, the tool was refined, resulting in a reduction to 115 items. These experts were then asked to complete the tool to establish its quantitative face validity. On the basis of the impact scores (IS) calculated, 30 items were removed. The outcome was a streamlined tool with 85 questions, ready for the subsequent phase of content validity determination (Table 3).

Content validity

During the qualitative validity phase, the tool's items were refined with input from experts. Subsequently, the quantitative phase involved calculating the content validity ratio (CVR) for each item using the Lawshe table. With 20 experts, items scoring below 0.42 were eliminated. No new items were suggested by the experts, resulting in a tool with 60 items.

The content validity index (CVI) was then determined on the basis of each item's relevance, as rated by the experts. Items with a CVI score above 0.79 were retained, leading to a final selection of 52 items. These items span six domains: governance, information, resources, service

Table 3 Demographic characteristics of experts participating in the psychometric evaluation process

Characteristics		*N* (%)	Total (%)
Gender	Female	12 (60%)	20 (100%)
	Male	8 (40%)	
Education	GP (MPH)	1 (5%)	20 (100%)
	PhD	19 (95%)	
Field of knowledge	Healthcare management	8 (40%)	20 (100%)
	Health in emergencies and disaster	1 (5%)	
	Health economist	1 (5%)	
	Health policy-maker	1 (5%)	
	Geriatric nursing	4 (20%)	
	General practitioner (geriatric MPH)	1 (5%)	
	Environmental health	2 (10%)	
	Health and social welfare	1 (5%)	
	Geriatric psychology	1 (5%)	

delivery, social participation and outcomes, forming a comprehensive tool to assess the age-friendliness of health systems (Table 4).

Reliability

The reliability of the AFHS assessment tool was verified through two distinct methods:

Test–Retest Reliability The tool was distributed to 20 managers twice, with a 2-week interval. The Wilcoxon signed-rank test, a non-parametric method suitable for ordinal data and small sample sizes, was employed due to the data not meeting the assumptions required for parametric testing [22]. The lack of significant differences in scores over the two administrations (p-value = 0.59) suggests the tool's stability and consistency over time.

Inter-rater reliability Three evaluators independently assessed the AFHS using the tool. The intraclass correlation coefficient (ICC) and Cronbach's alpha were calculated to measure observational reliability. An ICC of 0.86 and a Cronbach's alpha of 0.94 indicate a high level of internal consistency and agreement among the evaluators' assessments.

These results collectively demonstrate the tool's reliability, ensuring that it produces stable and consistent evaluations when applied by different users or at different times.

Discussion

The study successfully developed an AFHS assessment tool with robust psychometric properties. The finalized tool comprises 52 items across 6 domains: governance, information, resources, service delivery, community involvement and outcomes. Each item is rated on a 10-point Likert scale, yielding a total score range of 0 –520, where higher scores indicate a more AFHS.

Governance. This domain assesses the health system's leadership in addressing the health needs of older adults, emphasizing the importance of a well-informed management, multi-sectoral policy-making and the inclusion of specialists, older adults and their families in decision-making processes.

Information. It focusses on the necessity of an integrated medical information system for the elderly, accessible across all health centres, alongside a functional referral system and a performance monitoring system that utilizes standard indicators to identify and address system weaknesses.

Resources. Every health system needs proper supply and allocation of resources to perform its tasks properly. The AFHS also needs to build infrastructures that are suitable for the needs of older people. The needs of older people for long-term care centres and day care centres should be met. This dimension of the AFHS emphasizes that the provision of mobility aids and equipment for adults is one of the duties of this system. Additionally, considering the high costs of health services for elderly individuals, financial access to health services for all the elderly without catastrophic costs should be provided through the establishment of long-term care insurance and proper rehabilitation. In addition, proper training and employment of various specialists in the field of geriatrics is one of the important components evaluated in this domain of the AFHS.

Service delivery. This domain evaluates the health system's infrastructure and resource allocation, ensuring they cater to the needs of older adults, including long-term care facilities, mobility aids and financial accessibility to health services without incurring catastrophic costs.

The service delivery domain underscores the importance of timely preventive services and screenings to mitigate disabilities and diseases among the elderly. It also emphasizes the need for acute and inpatient services to cater to the unique needs of older adults, advocating for the proper implementation of clinical guidelines by healthcare professionals. Additionally, this domain considers the benefits of home care and efforts to minimize hospital stays for the elderly.

Community involvement. reflects the essential role of societal sectors, including families, NGOs, charities and the private sector, in providing comprehensive health services to meet the diverse needs of older adults.

Outcomes. The outcomes domain focusses on the tangible results of an AFHS, such as the satisfaction of the elderly with the quality of health services and insurance coverage, as well as their contentment with long-term care facilities.

For future research, it is recommended that this tool be utilized to evaluate health systems across various populations and cultural contexts, identifying strengths and areas for improvement. Additionally, studies exploring the tool's potential applications in health system planning and evaluation could provide valuable insights into its effectiveness.

This comprehensive approach ensures that the health system is responsive to the evolving needs of an ageing population, aiming to enhance their quality of life and healthcare experience.

Conclusions

The development of this AFHS assessment tool represents a significant step forward in evaluating healthcare services for the elderly in Iran. Its comprehensive nature, grounded in cultural and local contexts, allows for a nuanced understanding of the system's effectiveness. The

Table 4 Domains and items of assessment tool for age-friendly health systems (AFHS)

Domains	Sub-domains/items
Governance	1. Top managers of the health system are familiar with the concept of an AFHS
	2. Various organizations are involved in the policy-making of the health of the elderly (Ministry of Welfare, various insurances, welfare, municipality, pension fund, education, etc.)
	3. Experts are involved in policy-making and decision-making in the field of elderly health
	4. Older people and their families participate in the policy-making and decision-making of the AFHS
	5. Research results are used in health system policy-making and decision-making
	6. Policy-making is based on the needs of the elderly (the needs of the elderly are taken into account in the design, implementation and evaluation of the elderly care program)
	7. Different dimensions of health (physical, mental, social, etc.) are considered in programs related to the health of elderly individuals
	8. The government of health has specific and written plans to prepare the infrastructure for the ageing of the population (increasing the ratio of the elderly)
	9. The capacity of the educational system is used for the students of different levels for education related to the health of the elderly (to understand the problems of elderly individuals, the needs and characteristics of elderly individuals, how to interact with them, etc.)
	10. The capacity of public media is used to teach health-related topics to elderly individuals
Information	Research and development
	11. To identify health needs and organize and provide services, academic research projects are carried out in the field of geriatric health
	Monitoring and evaluation
	12. There is a comprehensive system of monitoring, evaluation and supervision to evaluate the efficiency and quality of geriatric health services using standard indicators at the top of the health system
	13. There is a feedback system at all levels of providing services to elderly individuals. (After referring the patient from one level to another level, the patient's condition will be reported to the referring level)
	Documentation and instructions
	14. The integrated electronic system of elderly health information works correctly and with quality in all levels of care. (Including hardware system, software, human resources, electronic file quality performance)
	15. There are guidelines related to treatment (second-level care), rehabilitation (third-level care), disease and disability prevention (primary geriatric care), fall prevention, treatment and rehabilitation of fallers

Table 4 (continued)

Domains	Sub-domains/items
Resources	Human resources
	16. The number of health manpower required to provide services to the elderly in all health departments has been determined and provided
	17. There is a comprehensive evidence-based method for proper policy-making and legislation in the field of allocation and use of human resources needed to provide services to elderly individuals
	18. The skills needed by employees to provide service to the elderly in all health sectors have been determined
	19. Adequate and high-quality training and retraining professional skills courses are held for the employees regarding geriatric care management (GCM)
	20. The necessary conditions and motivation (providing financial and psychological support, daily leave, etc.) to work with the elderly have been provided for the employees providing services to the elderly (officially and informally)
	21. In different centres, services are provided to the elderly through specialized, trained and efficient human resources
	22. Comprehensive and multidisciplinary networks of various health professionals' work together to provide services to elderly individuals
	Infrastructures
	Drugs and equipment
	23. There is a management system for the pharmaceutical services of the elderly [supervision and review of prescription methods, rational use of drugs with a focus on the special needs of drug care and simultaneous use of several drugs (polypharmacy)]
	24. The health system provides all medical equipment and assistive devices for elderly individuals
	Service provider centres
	25. The physical environment and facilities of health service centres have been secured to prevent the elderly from falling
	26. Service provider centres equipped with necessary healthcare facilities are built and designed according to the health problems of elderly individuals
	27. Care centre and hospice (daily, full-time) elderly care is established and available in sufficient numbers
	Financing
	28. Insurance plans for health services specific to the elderly (including rehabilitation services and long-term care, home treatment, medical equipment, mobility aids, etc.) have been provided
	29. Service packages tailored to the diverse needs of the elderly (such as basic medicines and affordable technologies) have been developed by insurance companies
	30. The costs of health services for the elderly can be paid (the elderly have access to health services without an unbearable financial burden.)

Table 4 (continued)

Domains	Sub-domains/items
Service delivery	Primary care
	31. Health centres fully implement primary care (health promotion, implementation of guidelines for prevention and screening of geriatric diseases, health counselling, lifestyle, priority in vaccination) for elderly individuals
	32. The high-risk elderly identification program is carried out by implementing appropriate interventions
	33. Comprehensive Geriatric Assessment (CGA) (including medical assessment, functional assessment, psychological assessment, social assessment and environmental assessment) is implemented
	Secondary care
	34. Integrated models of service delivery (from primary care to end-of-life care) are implemented in health services provider centres
	35. The health system fully implements the guidelines related to the treatment of geriatric diseases
	Tertiary care
	36. There is sufficient supervision on the quality of service provision in long-term care centres
	37. The system of long-term person-centred care and hospice care has been established at home and in the community
	38. The health system fully implements the guidelines related to the rehabilitation of diseases and disabilities of the elderly (stroke, fall, etc.)
	Common features for primary, secondary and tertiary care
	39. There is a monitoring system for the process and admission time, hospitalization and discharge of the elderly from health service provider's centre
	40. After discharge from the health service provider centre at any level, post-discharge support is provided to elderly individuals
	41. All the health services needed by the elderly are provided through the government sector
	42. When visiting the service centres, necessary trainings are provided to enable elderly individuals, their families and caregivers
	43. If possible, providing services and care for the elderly is done at home and among the family (with the support of the health system)
	44. In the health service centres, the geriatric health program is specially designed by the geriatric expert team on the basis of the needs of elderly individuals
	45. In the health service centres, separate space and facilities for the elderly have been provided to provide services to them
	46. The health system actively provides services to elderly individuals
	47. In health service provider centres, there is access to geriatric health experts to provide various health services (including training of employees, caregivers, elderly, family, etc.)
Community involvement	48. The capacity of the private sector (residence, human resources, etc.) is used in providing health services to elderly individuals
	49. The health system has an effective relationship with non-governmental organizations in the field of geriatric health
Outcome	50. The elderly are satisfied with the way health services are provided
	51. Due to the facilities and appropriate services of long-term care centres/sanitary homes, the elderly feel good about living in these centres
	52. The elderly are satisfied with the coverage of health services by insurances

tool's robust psychometric validation process and high reliability ensure that it can serve as a reliable instrument for policy-makers and healthcare providers to identify areas of strength and opportunities for improvement within the health system.

The tool's six domains – health governance, information, resources, service delivery, community involvement and outcomes – cover a broad spectrum of factors that contribute to an age-friendly health system. This breadth ensures that the tool not only assesses the current state, but also guides future enhancements tailored to the needs of the elderly population. By incorporating indicators that resonate with the mental and functional realities of Iranian society, the tool also offers a culturally relevant

framework that can be used to compare AFHS across different regions and cultures. Such comparisons could lead to a deeper understanding of global best practices and the adaptation of successful strategies to local contexts.

Overall, the tool's design and validation process underscore its potential as a comprehensive and adequate measure of the AFHS, particularly within the unique cultural setting of Iran. It sets a precedent for future research and application in the ongoing effort to optimize healthcare for older adults.

Acknowledgements
The authors would like to express their deepest gratitude and appreciation to the Ethics Committee of Tehran University of Medical Sciences (TUMS).

Author contributions
B.K., A.O.T. and M.T. were responsible for conception or design of the work; B.K. for data collection; B.K., A.O.T. and M.T. for data analysis and interpretation; and B.K., A.O.T., M.Y. and M.T. for drafting the article, critical revision of the article and final approval of the version to be submitted.

Funding
The authors received no specific funding for this work.

Availability of data and materials
The datasets used and/or analysed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
This study was approved by the Ethics Committee of the TUMS (IR.TUMS.SPH.REC.1395.1542). The personal information of all participants was guaranteed. In addition, before starting the study and conducting interviews with the experts and elderly participating in the study, informed consent was obtained from all individuals and/or their legal guardian(s). In addition, in the qualitative phase, voices of participants were recorded with their permission, and instead of their names, specific codes were used in the interview texts. All measures and activities in this study were performed based on accepted scientific principles and ethical considerations in accordance with relevant guidelines and regulations (Declaration of Helsinki).

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

Received: 24 October 2023 Accepted: 19 September 2024
Published online: 10 October 2024

References

1. Goharinezhad S, et al. A qualitative study of the current situation of elderly care in Iran: what can we do for the future? Glob Health Action. 2016;9(1):32156.
2. Population Division of the United Nations Department of Economic and Social Affairs (UN DESA). World Population Prospects 2022: summary of results. Available at: https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/undesa_pd_2022_wpp_keymessages.pdf
3. Maghsoudi A, Mohammadi Z. The study of prevalence of chronic diseases and its association with quality of life in the elderly of Ewaz (south of Fars province), 2014. Navid No. 2016;18(61):35–42.
4. Pourhabib A, et al. Effects of aerobic and resistance exercise program on sleep quality in the elderlies with heart failure. J Babol Univ Med Sci. 2018;20(11):63–7.
5. Ghaffari F, Alipour A, Fotokian Z. The effects of education on nurses' ability to recognize elder abuse induced by family members. Nurs Midwifery Stud. 2020;9(1):1.
6. Ryan J, et al. How high-need patients experience health care in the United States. Commonw Fund. 2016;43:1–20.
7. Fulmer T, Mate KS, Berman A. The age-friendly health system imperative. J Am Geriatr Soc. 2018;66(1):22–4.
8. (ACICBL) A.C.o.I.C.-B.L. Preparing the current and future health care workforce for interprofessional practice in sustainable, age-friendly health systems 17th annual report to the secretary of health and human services and august 2019 the U.S. Congress 2019.
9. Mate KS, et al. Creating age-friendly health systems—a vision for better care of older adults. Healthcare. 2018;6(1):4–6.
10. Ahmadi A, Seyedin H, Fadaye-Vatan R. Towards age-friendly hospitals in developing countries: a case study in iran. Health Promot Perspect. 2015;5(1):42–51.
11. Karami B et al. Developing a conceptual framework for an age-friendly health system: a scoping review. Int J Health Policy Manag. 2023;12:7342.
12. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. Nurs Educ Today. 2004;24(2):105–12.
13. Sandelowski M. Theoretical saturation. SAGE Encyclopedia Qual Res Method. 2008;2:875–6.
14. Grady MP. Qualitative and action research: a practitioner handbook. Arlington: Phi Delta Kappa International; 1998.
15. Lang TA, et al. Nurse–patient ratios: a systematic review on the effects of nurse staffing on patient, nurse employee, and hospital outcomes. JONA J Nurs Administration. 2004;34(7):326–37.
16. Polit DF, Yang FM. Measurement and the measurement of change: a primer for the health professions, vol. 3. Philadelphia: Wolters Kluwer; 2016.
17. Haynes SN, Richard D, Kubany ES. Content validity in psychological assessment: a functional approach to concepts and methods. Psychol Assess. 1995;7(3):238.
18. Rungtusanatham M. Let's not overlook content validity. Decision Line. 1998;29(4):10–3.
19. Lawshe CH. A quantitative approach to content validity. Pers Psychol. 1975;28(4):563–75.
20. Polit DF, Beck CT. The content validity index: are you sure you know what's being reported? critique and recommendations. Res Nurs Health. 2006;29(5):489–97.
21. Govender R, Schlebusch L. Suicidal ideation in seropositive patients seen at a South African HIV voluntary counselling and testing clinic. Agnes Karll Schwest Krankenpfleger. 2012;15(2):94–8.
22. Campbell MJ. Statistics at square one. Hoboken: John Wiley & Sons; 2021.

Publisher's Note