Developing a progress assessment model for age friendly primary health care initiatives

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Abstract

Background In response to the significant increase in the global aging population, countries have increasingly prioritized Age-Friendly Primary Health Care (AFPHC) to address the unique needs of older adults. This study aims to develop a comprehensive model for assessing the progress of PHC systems in achieving the goals of an elderly-centered services.

Method A qualitative study design was utilized to develop the progress assessment model for AFPHC initiatives. This process involved a literature review (academic databases and manual search), semi-structured interviews, an expert panel discussion, and the Delphi technique for achieving consensus on the final model. Participants in the semi-structured interviews were selected based on specific inclusion criteria, which required professionals and stakeholders to have a minimum of two years of experience in care for older adults and active involvement in PHC. Additionally, older adults with a university education who had accessed PHC services in Iran at least three times were included. The expert panel was composed of multidisciplinary professionals who met similar criteria, ensuring a diverse and informed perspective.

Findings According to literature review results, 16 main domains and 28 sub-domains were identified. In the next step, through interviews, 7 main domains and 71 indicators were extracted. After summarizing the results of literature reviews, and interviews, and analyzing the results of the Delphi technique, the initial model with 7 main domains, including policymaking and planning processes related to older adults, principles of respect and interaction with older adults, education for older adults, principles of care and provision of services to older adults, access to PHC facilities, physical environment, specialized facilities and equipment, and human resources, was finalized along with the 60 indicators.

Conclusion The developed model for assessing progress of AFPHC Initiatives offers a comprehensive framework by focusing on key domains and indicators tailored to the needs of older adults. This model serves as a practical tool for assessing the progress of AFPHC, facilitating improvements in the quality and accessibility of PHC services for older adults.

Keywords Primary Health Care, Age-Friendly, Aged, Progress Assessment, Indicators

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Introduction

The global population is aging at an unprecedented rate, driven by declining fertility and mortality rates, increased life expectancy, and shifts in the age structure of societies [1]. This demographic transformation has emerged as one of the most significant economic, social, and healthcare challenges of the 21st century [2]. According to estimates, the global population aged 60 and above is expected to grow from 1 billion in 2019 to 2.1 billion by 2050, particularly in developing countries [3–5]. Similarly, the aging population in Iran is undergoing significant demographic shifts. By 2050, it is projected that individuals aged 60 and older will constitute 31% of the population, with those aged 65 and older accounting for 22% [6]. This trend underscores the pressing need for healthcare systems worldwide to adapt to the specific demands of aging populations, including chronic disease management and specialized elderly care [3, 4].

Currently, developed countries have focused on articulating goals, needs, priorities, and developing comprehensive plans concerning the needs of older adults [7]. Additionally, all countries worldwide recognize aging as a significant social phenomenon and strive to make continuous and concerted efforts to implement social support programs and address their natural needs [8]. One of the most important aspects is the development of Primary Health Care (PHC) services tailored to the needs of older adults [9, 10]. However, assessments conducted reveal significant deficiencies in providing adequate services to the older adult population, despite considerable progress and achievements in this field [11, 12]. Therefore, the WHO emphasizes the critical importance of access to and alignment of healthcare facilities with the needs of older adults and advocates for older adult-friendly environments by introducing principles of prevention, providing guidelines aimed at improving PHC services for older adults globally [13]. To address the unique needs of older adults, several models have been introduced globally. A well-known example is the World Health Organization's "Age-friendly Primary Health Care" (AFPHC) model, which focuses on meeting the physical, emotional, and social needs of elderly [14]. Similarly, the "Age-Friendly Health Systems Initiative" in the United States adopts the "4Ms" framework—What Matters, Medication, Mentation, and Mobility—as a structured approach to enhance health system preparedness for delivering specialized care to older populations [15].

The implementation of AFPHC faces several challenges. A key barrier is the lack of buy-in from healthcare providers, which limits the integration of age-friendly practices into routine care [16]. Many providers also lack proper training in geriatric care, leading to an inability to address the unique needs of older patients effectively [17]. Financial constraints further restrict the ability to implement essential programs, while the complex health issues of older adults require a coordinated approach that current systems often cannot offer [18]. Additionally, outdated healthcare policies, such as insurance plans, do not fully support the changing needs of the aging population [19]. These challenges hinder the successful integration of age-friendly practices into existing healthcare systems [20]. Overcoming them is essential for creating an effective AFPHC assessment framework, which is a crucial step in ensuring that healthcare systems worldwide can meet the needs of aging populations.

Based on our best knowledge and an initial literature review, significant gaps exist in assessing the provision of AFPHC for older adults, particularly due to the lack of comprehensive and suitable indicators. Therefore, this study aims to address this gap by developing a progress assessment model for AFPHC initiatives.

Method

This was a qualitative study using a grounded theory approach, aimed at developing a progress assessment model for AFPHC. Grounded theory is a qualitative research method that utilizes various data collection methods such as literature review, interviews, observation, and expert panels to generate new evidence about the phenomenon under study. This method is used when the research literature on the topic is not sufficiently rich [21]. The research question guiding this study was: How can a robust and practical model be developed to assess the progress of AFPHC initiatives? The study's objective was to provide new and actionable knowledge to address this question and offer insights that have received limited attention in scientific communities. Throughout this study, the Consolidated Criteria for Reporting Qualitative Research [22] (COREQ) criteria have been followed for reporting qualitative research. This study was conducted in four steps: literature review, interviews with stakeholders and older adults, expert panel discussions, and the Delphi technique.

Step 1 Identification of domains and sub-domain for assessing progress of AFPHC initiatives worldwide through literature review.
Literature review was utilized to identify domains and sub-domain for assessing progress of AFPHC initiatives. A search was conducted from the beginning of 2002 to the end of 2023 using PubMed, Google Scholar search engine, and relevant websites. In this phase, any scientific documents (articles, reports) reporting suitable domains, sub-domain, or indicators for assessing AFPHC in English or Persian were included in the study.

Search strategy in PubMed: (((((((((Standard*[Title/Abstract]) OR (indicator[Title/Abstract])) OR (index[Title/Abstract])) OR (assess*[Title/Abstract]))

OR (evaluat*[Title/Abstract])) OR (monitoring[Title/Abstract])) OR (model[Title/Abstract])) OR (framework[Title/Abstract])) AND (((((elderly[Title/Abstract]) OR (older[Title/Abstract])) OR (aging[Title/Abstract])) OR (senior[Title/Abstract]))) AND ((((("primary health care"[Title/Abstract]) OR ("primary health services"[Title/Abstract])) OR ("community health services"[Title/Abstract])) OR ("Age-Friendly"[Title/Abstract])) OR ("Age-friendly primary health care"[Title/Abstract]))

   * Filters applied: Full text, English.

   Hand-searching of selected journals and article references, examination of published governmental and organizational reports, websites of various countries, and other available information sources were also conducted.

   The titles of retrieved articles and documents were screened, and abstracts and full texts were reviewed for eligibility. After completing the initial screening, selected articles underwent further evaluation in the second step of selection and screening. Again, two members of the research team independently reviewed the articles to determine their relevance and suitability for inclusion in the study. Any disagreements between the two individuals were resolved through discussion and consensus. However, in cases where consensus could not be reached or further expertise was needed, consultation with a third person with more expertise in the specific field was sought. Endnote X8 reference management software was used for organization, reading titles and abstracts, and identifying duplicate entries. The PRISMA: 2020 flowchart was used to report the results of the selection and screening process. Based on the data extraction, an initial data extraction form was designed using Microsoft Word 2010 software, considering initial literature reviews, research team opinions, and input from a few experts. After finalizing the data extraction form, two researchers independently extracted information from the entered articles and documents. Any ambiguities were resolved through discussion with the research team. The data extraction table included author, publication year of the article or report, country, document type - report or article (article type), study objective, data collection tools and methods, main domains, and sub-domains/sub-categories. Content analysis was used to analyze the extracted data, a method commonly used for identifying, analyzing, and reporting themes present in texts [23]. The analysis was conducted in the following stages: multiple reviews of the data, collecting information to develop initial codes, searching for themes, developing themes (creating a conceptual map), defining and labeling themes, summarizing and categorizing themes, and finally, a reassessment of analysis validity by two researchers to reach consensus.

Step 2 Stakeholder and expert perspectives on domains and indicator for assessing progress of AFPHC initiatives.

In this study, according to the specialized nature of the subject and the need for the opinions of experts and people with the experience and responsibility of providing care and services to the elderly, 10 experts and responsible people were included. Also, considering that the main target group of this study was the elderly and it was necessary to seek the opinions of the older adults with different characteristics in terms of cultural, social, and educational level, 7 older adults with the mentioned characteristics participated in this study. The inclusion criteria for professionals and stakeholders included having at least two years of experience and involvement in activities related to older adults, working in PHC, having an interest in the study topic, and willingness and capability to participate in the study.

   For participant selection, purposive sampling method was employed in this study. In this method, individuals are selected as participants who have the richest and most comprehensive information and can appropriately provide their insights to the researchers [24, 25]. Sampling continued until data saturation was reached, meaning that researchers felt that no new information would be obtained by continuing sampling [26]. In this study, a total of 17 participants were involved in this step.

   The data collection was conducted using semi-structured interviews with participants in the study, with their consent, and their perspectives were recorded immediately after each interview. Additionally, note-taking was performed during the interview sessions. In this step, a semi-structured interview guide was used to conduct the interviews. The semi-structured interview guide was developed by researchers based on literature review. After drafting the interview guide, two pilot interviews were conducted by one of the research team members to test the semi-structured interview questions. After confirming the clarity and comprehensibility of the refined interviews by all research team members, the data form was used for all participants. Participants were individually interviewed using the semi-structured interview method. During the interviews, some questions were adjusted, and participants were encouraged to provide more explanation with prompts such as "Can you elaborate a bit more on your response?" or "What do you think about this topic, and what does it mean to you?" All interviews were conducted in Persian and Turkish languages by the same two researchers and lasted an average of 50 min. In total, 985 min of audio recordings were made during the interviews. The interviews were transcribed verbatim by the researchers. After completing all interviews, the study data were transcribed for analysis. Finally, 10 stakeholders and 7 highly educated older adults participated in this study (Table 1).

Table 1 Sociodemographic and characteristics of study participants (*n* = 17)

Characteristic	Category	Number of Participants	
		Professionals	Older adults
Sex	Female	4	5
	Male	6	2
Age (Mean)		43.7 ± 13.2	62.3 ± 3.1
Education Level	Diploma	-	2
	Bachelor	1	4
	Master	1	1
	Doctoral or Higher	8	-
Professional Background	Geriatric Health	5	
	Health Policy	2	
	Public Health	2	
	Health management	1	

In this study, data were analyzed using thematic analysis method based on the approach defined by Braun and Clarke (2006) [27]. Since the study was based on an inductive approach, no predefined themes were identified. The recorded interviews were transcribed and manually coded using Microsoft Word 2016 software. In case of disagreement in coding, the suggestions and consensus of a third researcher were used. Then, the content of each code was summarized and reviewed for themes until no new themes emerged. Initial coding was completed, and concepts and coding were discussed and reviewed multiple times by all researchers before the final version was classified before the expert panel session. The codes were determined based on the recommendations of Gibbs (2007), and codes with similar meanings were grouped into subcategories, categories, and themes. Finally, main and sub-themes were named and defined [28].

To enhance the rigor and validity of the study, four criteria proposed by Guba and Lincoln [29] were utilized. Credibility and Confirmability: For these criteria, immersion and review by colleagues were employed, along with using the opinions of experts and stakeholders. After concluding the sessions and summarizing participants' opinions, a summary of their statements based on the notes taken during the sessions was presented to them to correct any misunderstandings and ambiguities. Dependability: For this criterion, two individuals were involved in coding.

Transferability: For this criterion, the opinions of stakeholders and experts, as well as purposive and heterogeneous sampling, were used.

Step 3 Initial Development of Domain and Indicator for assessing progress of AFPHC initiatives - Expert Panel.
In this step, utilizing the results from previous steps (including literature review and interviews with stakeholders) and holding an expert panel with the participation of research team members and some informed stakeholders, the initial domains and indicators for assessing progress of AFPHC initiatives were developed. The initial domains extracted from the literature review and interviews for assessing AFPHC included:

- Policy-making and planning processes related to older adults.
- Principles of respect and interaction with the older adults.
- Education for the older adult.
- Principles of care and service provision to the older adults.
- Access to PHC centers.
- Physical environment, facilities, and equipment tailored to the needs of the older adults.
- Human resources (providing appropriate and specialized services to the older adults).

In this step, according to the results of a literature review, semi-structured interviews, a draft of the model was prepared by the research team. The expert panel members' specialized opinions were then used to refine and complement the domains of the model and the related indicators. A few days before the panel session, information regarding the study's objectives, instructions on data collection methods, and the content obtained from literature reviews and interviews were emailed to the panel participants. At the beginning of the session, the session leader explained the session's objectives, and during the session, participants were informed that their participation was voluntary, and they could leave the session if they wished. All conditions were mentioned during this session. The panel consisted of eight members and lasted approximately 120 min. The entry criteria for the panel were similar to those of the second step. These sessions were conducted in person.
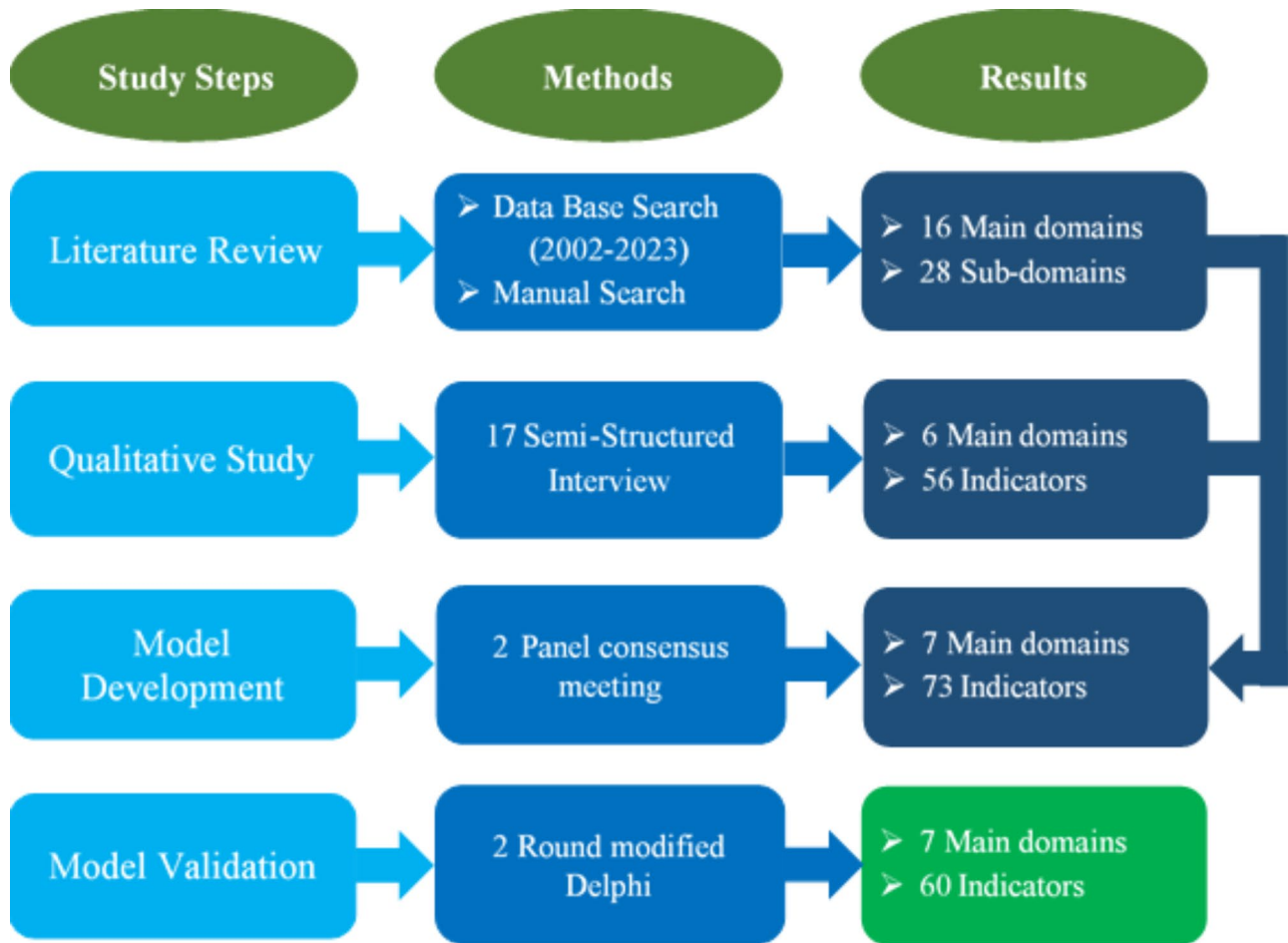
Step 4 Validation of the progress assessment model for AFPHC initiatives through Delphi method.
In this step, after designing the initial plan, the Delphi technique was utilized to gather opinions from stakeholders and finalize the model. A modified Delphi form, previously used by researchers [30] (Table 2). In this form, each stakeholder rated each indicator on two criteria: importance (whether the indicator is important and should be prioritized) and feasibility (how feasible it is to gather information on this indicator). Stakeholders first expressed their overall opinion by selecting one of three options: "Disagree," "Neutral," or "Agree." Then, based on their previous selection, they assigned a score from 1 to 9 to each indicator (1 to 4 = Disagree, 5 = Neutral, 6 to 9 = Agree). In this step, indicator that received a median score of 7 or higher were accepted as final. Indicators

Table 2 Delphi form used in validating the indicators for assessing progress of AFPHC initiatives

Area:						
Indicator Title:						
Brief Description of the Indicator:						
Your Comments and Suggestions:						
	Feasibility			Importance		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree
	4 3 2 1	1	2 3 4	4 3 2 1	1	2 3 4

with a median score between 4 and 7 proceeded to the second round of Delphi, while indicators with a median score below 4 were removed from the study.

The Delphi questionnaire consisted of three sections: a brief introduction about the study's objectives and necessity, a guide on completing the forms, and the forms themselves. The Delphi forms were sent to participants via email, allowing two weeks for completion. After this period, a reminder email was sent.

Results

Main domains and related indicators for the assessing progress of AFPHC initiatives were reviewed and selected in four main steps. In the first step, 16 main domains and 28 sub-domains were extracted through literature review. In the next step, 6 main domains and 56 indicators were identified. Based on the previous two steps results, the preliminary model was developed with 7 main domains and 73 indicators. In the final step, throughout two rounds of Delphi technique, these indicators were reviewed, and 13 of the 73 indicators were removed. Finally, 60 indicators were selected to develop the AFPHC progress assessment model (Fig. 1).

Literature review

In total, a search of the PubMed database yielded 1978 studies. After initial removal of irrelevant articles, 1122 articles entered the screening phase. In the first screening phase, two researchers independently screened articles based on their titles and abstracts. In this phase, 988 articles were removed due to irrelevance. Full-text was not available for 7 articles. In the second screening phase, researchers examined the full text of the remaining articles. After reviewing the full text, 122 more articles were excluded due to irrelevance or not meeting the inclusion criteria. Ultimately, 5 articles from PubMed and 4 articles and reports from other sources were identified and included in the study (Appendix 1 - Data Extraction Table).

By reviewing the extracted articles and reports, initially, 44 main domains and 140 sub-domains were identified from the studies. After summarizing the results of the literature review and removing duplicate items and merging similar ones, 16 main domains and 28 sub-domains were obtained (Table 3).

Qualitative study

Through the analysis of semi-structured interviews conducted with stakeholders and older adults, 6 main domains and 56 indicators were extracted. These six main domains included:

1. Policy-making processes related to older adults (11 indicators).

Fig. 1 Development flow of Progress Assessment Model for Age-Friendly Primary Health Care Initiatives

2. Adherence to principles of respect for older adults (7 indicators).
3. Education for older adults (6 indicators).
4. Principles of providing services to older adults (12 indicators).
5. Access to PHC centers (9 indicators).
6. Facilities and equipment specific to older adults (11 indicators).

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After refining and completing the main domains and indicators with input from an expert panel, a preliminary model was formulated with 7 main domains and 73 indicators.

Validation of Progress Assessment Model for Age-Friendly Primary Health Care initiatives

Following the initial model development, a Delphi form of proposed indicators was subjected to validation and presented to a panel of 15 experts. In the first round of Delphi, 8 indicators were eliminated due to median

scores less than 4 (6 indicators in the feasibility criteria, 1 indicator in the importance criteria, and 1 indicator in both feasibility and importance criteria). Subsequently, 16 indicators (with a median score ranging from 4 to 7) proceeded to the second round of Delphi, involving 10 participants. After the second round of Delphi, 3 more indicators (all due to low feasibility) were removed, concluding the Delphi process. Finally, the finalized model comprised 7 main domains and 60 final indicators (Table 4).

The average of median scores for each of the main domains were calculated (Fig. 2). All of main domain's scores were equal and higher than score of seven.

Discussion

A progress assessment model for AFPHC initiatives was developed and validated through literature reviews, semi-structured interviews with stakeholders and older adults, expert panels, and two rounds of Delphi technique. The model consists of 7 main domains and 60 indicators: Policy making and planning processes related to older adults (12 indicators), Principles of respect and interaction with

Table 3 Main domains and sub-domains of Age-Friendly Primary Health Care initiatives extracted from literature

Main domains	(1) Education and information, (2) Health service management system, (3) Physical environment, (4) Provision of assistive tools to increase accessibility, (5) Development of ethical codes for healthcare providers, (6) Population change trends and epidemiology, (7) Older adults in the current population structure and future outlook, (8) Demographic transitions and social planning, (9) Population aging and disease burden, (10) Population aging and healthcare system, 11. Lifestyle and disease, 12. Population aging and healthcare needs, 13. Health economics, 14. Nature of care, 15. Level of compliance, 16. Functional domains
Sub-domains	(1) Transportation, (2) Signage, (3) Facilities and equipment, (4) Physical environment, (5) Counseling and guidance process, (6) Costs, (7) Communications, (8) Referral system, (9) Dissemination of healthcare knowledge, (10) Medication management, 11. Older adults care standards, 12. Staff communication skills, 13. High waiting times due to staff shortages, 14. Staff unawareness of older adult's patients' multi-morbidity, 15. Lack of respect and inadequate responsiveness to older adult's patients' needs, 16. Lack of old adult -friendly atmosphere, 17. Fertility issues, 18. Mortality rates, 19. Stress, 20. Dementia and Alzheimer's, 21. Social atmosphere, policies, and trends, 22. Care communication and processes, 23. Staff education, screening, and assessment, 24. Care philosophy (social services), 25. Supportive environment (legal, service-related, emotional, social), 26. Caregiving environment (hygiene safety, health promotion, medical accuracy, active response) 27. Physical standards (entrance width, proper step height, emergency exits, etc.), 28. Equipment standards (wheelchair accessibility, medical equipment, etc.)

older adults (7 indicators), Education for older adults (9 indicators), Principles of care and service provision for older adults (14 indicators), Access to AFPHC (8 indicators), Physical environment, facilities, and equipment tailored to the needs of older adults (4 indicators), and Human resources (6 indicators).

Considering the importance emphasized by the WHO on the necessity of access to and alignment of healthcare facilities with the needs of older adults, a framework is recommended. In the model presented by the WHO for aligning healthcare facilities as much as possible with the conditions of older adults, emphasis has been placed. Given that most frameworks and models introduced by this organization provide general conditions for all countries to achieve the desired ideal conditions, there is a need for tools such as indicators to be available to measure the performance of friendly PHC for older adults and plan for its improvement. Therefore, in this study, we attempted to increase the quality of healthcare by presenting a localized model tailored to the country and older adults' conditions by collecting the opinions of

stakeholders through qualitative methods, analyzing and categorizing information, and developing final indicators for AFPHC to enhance the quality, clarity, and practicality of indicators and guidelines in this area.

Although many countries attempted to integrate and implement the concept of AFPHC introduced by the WHO in 2002 into their healthcare systems, literature reviews indicate that less attention has been paid to the use of performance indicators. Performance indicators play a crucial role in transparency, accountability, and quality. Furthermore, another importance of indicators is to demonstrate the extent to which goals are achieved [31, 32]. Designing a set of performance indicators is the first step towards improving performance in various areas [33].

In this regard, performance assessment indicators have been developed and used in many aspects of medical sciences to improve healthcare standards [34]. Another advantage of developing and introducing indicators is that these indicators can be used in different countries with minor adjustments tailored to the local conditions of each country. Therefore, researchers and officials from other countries (especially those with average and low income) can use the patterns of indicators introduced in this study and modify them according to the conditions of their healthcare system, PHC structures, economic and social structures, and other local conditions of their country. Use them to assess the performance of friendly PHC for older adults and plan for its improvement.

In this study, an attempt was made to develop comprehensive and complete indicators in various domains using models and evidence available in other countries and obtaining opinions from stakeholders and older adults themselves. The WHO model includes 3 main domains (1. Education and information 2. Health service management system 3. Physical environment) and 4 sub-domains (1. Access to facilities 2. Development of old adult -friendly ethical codes for healthcare workers 3. Improvement of overall care procedures 4. Development of a comprehensive approach focusing on older adult individuals) [13]. A study by Jean Woo, et al. in China (2013) evaluated guidelines provided by the WHO in 13 different domains (including (1) Transportation (2) Guidance center signage (3) Facilities and equipment (4) Physical environment (5) Counseling and guidance process (6) Costs (7) Communications (8) Referral system (9) Health knowledge dissemination (10) Drug consumption management 11. Older adults care standards 12. Communication skills of staff) in PHC centers [35]. A study by Jessica Tavares, et al. in Portugal (2011) discusses and evaluates the principles presented by the WHO and the effects of these principles on the healthcare system. The implementation of WHO principles for operationalization in PHC systems has been discussed. The main

Table 4 Main domains and indicators of the Progress Assessment Model for Age-Friendly Primary Health Care initiatives

Main Domains	Indicators
Policies and Planning Processes Related to Older Adults	1. Number of programs developed under the title of aging compared to the total number of PHC programs.
	2. Number of specific objectives set for PHC for older adults compared to the total number of specific objectives in the strategic program.
	3. Number of interventions and special programs designed and implemented for older adults.
	4. Existence of periodic evaluations for special programs for older adults.
	5. Implementation of necessary actions to overcome implementation barriers of the national aging document.
	6. Existence of programs to encourage older adults to seek services from reputable sources (through media, etc.).
	7. Implementation of annual community-based needs assessment programs.
	8. Existence of serious programs and actions to provide long-term care for older adults.
	9. Utilization of evidence and experiences from different countries in providing services to older adults.
	10. Formulation and implementation of supportive laws for older adults.
	11. Development of quantitative and qualitative preventive programs tailored to older adults in various areas.
	12. Allocation of budget for specific programs for older adults compared to the total budget for PHC.
Principles of Respect and Interaction with Older Adults	1. Existence of specific ethical codes in the ethical charter for providing services to older adults.
	2. Existence of written programs to honor and respect older adults.
	3. Formulation and implementation of transparent processes for addressing complaints from older adults.
	4. Development and implementation of educational programs on how to communicate with and honor older adults for healthcare providers.
	5. Evaluation program to identify old adult abuse and determine appropriate actions in a safe and confidential environment.
	6. Formulation of necessary actions to prevent and reduce old adult abuse in society.
	7. Collaboration with various organizations, including media, to educate families and enhance the dignity of older adults in society.
Education for Older Adults	1. Design and implementation of needs assessment programs for impactful educational areas in older adult health.
	2. Volume/number of educational contents for older adults compared to the total educational contents for PHC.
	3. Number of studies conducted on the effectiveness of PHC for older adults compared to the total studies in medical care.
	4. Number of healthcare facilities with sufficient conditions and resources for educating older adults compared to the total number of healthcare facilities.
	5. Existence of trained human resources in the field of older adult education.
	6. Number of physicians practicing geriatric medicine compared to the total number of physicians.
	7. Availability of suitable educational tools for older adults (large print, appropriate colors, simple and concise content, etc.).
	8. Number of families of older adults educated compared to the number of older adults covered.
	9. Formulation and implementation of educational programs using user-friendly health apps.
Principles of Care and Service Delivery for Older Adults	1. Determination of the compatibility of PHC with the physical, mental, and other characteristics of older adults.
	2. Number of programs developed for older adults compared to the total number of implemented programs for older adults.
	3. Existence of home care programs for older adults.
	4. Ratio of hospitalized older adults to total healthcare providers.
	5. Development and implementation of appropriate programs to assess and prevent depression in older adults.
	6. Development and implementation of appropriate programs to assess and prevent osteoporosis in older adults.
	7. Development and implementation of appropriate programs to assess and prevent hypertension and heart diseases.
	8. Development and implementation of appropriate programs to assess and prevent falls among older adults at home.
	9. Provision of dental care services for older adults.
	10. Development and implementation of programs to evaluate medication conditions and review medication interactions for older adults.
	11. Updating service delivery processes for older adults according to the best available evidence.
	12. Number of WHO-recommended care services currently implemented in the field of aging.
	13. Existence of home-based patient follow-up programs specifically for older adults.
	14. Number of culturally and ethnically adapted care services compared to the total number of care services.

Table 4 (continued)

Main Domains	Indicators
Access to PHC Facilities for Older Adults	1. Continuous monitoring and reporting of reasons for older adults' non-attendance at healthcare centers (disability, inadequate services, inappropriate treatment, etc.).
	2. Number of healthcare facilities providing PHC services compared to the total number of older adults in the area.
	3. Number of identified and registered older adults in the healthcare system compared to the total elderly population in that area.
	4. Population of older adults residing in suburban and rural areas compared to the total older adult population.
	5. Average waiting time for older adults to receive services.
	6. Existence of effective communication processes and methods to inform older adults about accessing healthcare services.
	7. Implementation of categorization programs for older adults based on mobility and physical capabilities.
	8. Number of healthcare facilities equipped with rehabilitation equipment for older adults compared to the total number of healthcare facilities.
Physical Environment, Facilities, and Equipment Tailored to Older Adults' Needs	1. Number of healthcare facilities standardized for providing services to older adults according to available standards compared to the total number of healthcare facilities.
	2. Number of specific equipment available for older adults compared to the specified equipment appropriate for older adults.
	3. Ratio of available equipment for older adults to the older adult population covered by the facilities.
	4. Number of healthcare facilities equipped with rehabilitation equipment for older adults compared to the total number of healthcare facilities.
Human Resources (providing suitable and specialized services to elderly)	1. Ratio of specialist human resources in geriatrics to the total healthcare providers
	2. Ratio of geriatric medicine specialists to the older adult population
	3. Ratio of employed geriatric medicine specialists to the total specialized human resources
	4. Existence of periodic performance evaluation policies for staff to determine their skills in providing services to older adults
	5. Number of experienced staff in the field of geriatrics compared to the total staff
	6. Number of hours of in-service training relevant to geriatrics compared to the total training hours
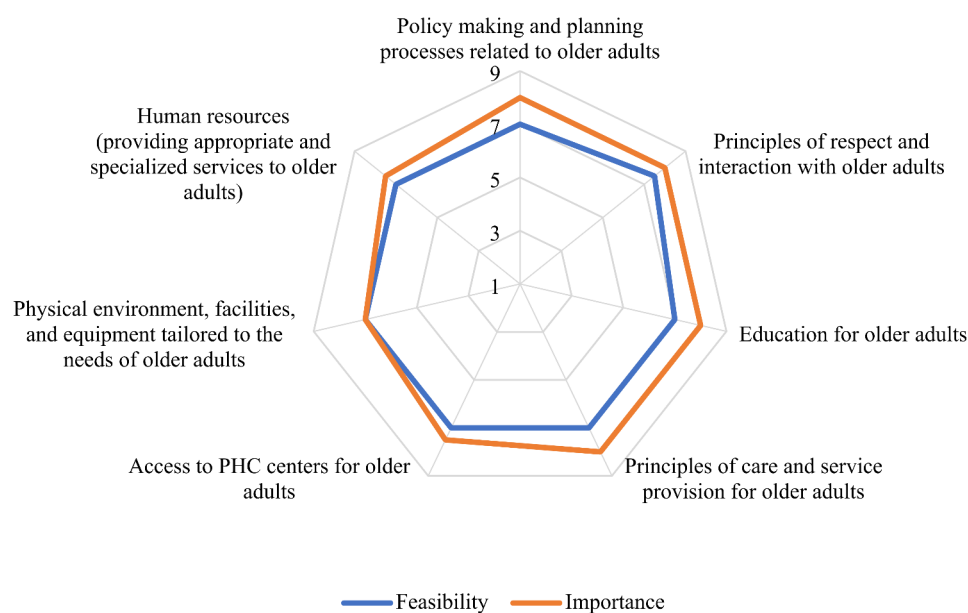
Fig. 2 Validity Scores of Key Domains in the Progress Assessment Model for Age-Friendly Primary Health Care Initiatives

domains of this study include: (1) Level of compliance (2) Level of conformity (3) Functional areas. Although the principles presented by the WHO have been considered, innovative aspects have also been identified in other areas. As for the sub-domains, the 13 domains are more or less similar to the proposed domains in the present study, hence the resemblance to our study. Researchers of this study have examined the operationalization of WHO principles and investigated who and with what

tools should evaluate it [36]. A study by Hoontrakul, et al. in Thailand (2013) examined three main domains: appropriate behavior towards the older adults, appropriate services for the older adults, and appropriate environment for the older adults. It considers positive thinking and social capital as effective factors in developing PHC and introduces solutions such as awareness of behavioral change concepts and suitable environments as necessary for the development of older adults-friendly services

and activities. It identifies four areas, including positive thinking, social capital, specialized forces, and health policies, as influential factors in the development of PHC [37]. A study by Khalil Ali Mohammadzadeh, et al. in Iran (2019) examined the characteristics of centers and proposed a framework suitable for current center criteria and features, emphasizing two important features: caregiver-supportive environment and caregiver-centricity, aiming to address the PHC needs of the older adults by creating a legal, emotional, and social environment. The findings of the study indicate that healthcare safety, older adults' health improvement, responsiveness, and treatment accuracy are factors that improve older adult's care. Understanding the experiences and needs of the older adults has been evaluated to design and present an appropriate framework based on the current characteristics of healthcare centers [38].

Despite the completion of the current study and existing research in this area, there is a need for more precise and comprehensive models and tools for assessing the performance of AFPHC and planning for its improvement. However, the finalized indicators in this study can be used by officials not only for assessing PHC centers but also for developing indigenous indicators. Policymakers can use the provided indicators in each domain to enhance the alignment and compatibility of healthcare centers with the needs of older adults and strive for ideal conditions. Nevertheless, several limitations existed in this study despite the use of literature reviews and input from stakeholders and older adults to develop and validate progress assessment model for AFPHC initiatives for the first time. Some of these limitations include the lack of access to high-level stakeholders and policymakers and not benefiting from their opinions. Furthermore, since this study involved various groups of individuals including older adults, experts, academics, and stakeholders in interviews, there were sometimes conflicting opinions in this area, making it challenging for us to summarize and make decisions regarding standards.

Conclusion

In this study, a progress assessment model for AFPHC initiatives was developed through literature reviews, semi-structured interviews with stakeholders and older adults, expert panels, and validated using two rounds of Delphi technique, consisting of 7 main domains and 60 indicators. Due to the lack of progress evaluation tools, paying attention to the indicators suggested in this study can be a good start to identify and solve the existing challenges in order to achieve AFPHC. Despite the completion of the current study, there is a need for more precise and comprehensive models and tools for assessing the progress of AFPHC initiatives and planning for its improvement adapted to the local conditions of each

country. Implementing the proposed indicators in this study in PHC facilities and disseminating them through guidelines and regulations, justifying and educating professionals and managers, as well as conducting a study to assess the current status of healthcare centers using the developed indicators in this study, is recommended.

Abbreviations
PHC   Primary Health Care
AFPHC   Age-Friendly Primary Health Care
WHO   World Health Organization

Supplementary Information
The online version contains supplementary material available at https://doi.org/10.1186/s12875-025-02741-0.

Supplementary Material 1

Data availability
The anonymized datasets analyzed during the current study are not publicly available due to concerns regarding participants' confidentiality but are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
This is a report of database from B.Sc thesis registered in Tabriz University of Medical Sciences with the Number IR.TBZMED.REC.1400.543. All participants were informed of the study methods and benefits of the process. Written and signed informed consent was obtained from participants before beginning the study.

Consent for publication
All participants were required to express their informed consent for publication prior to data collection.

Competing interests
The authors declare no competing interests.

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