Health Technol Assess Action 2026;10(1):38-47
doi:10.18502/htaa.v10i1.21566
https://htainaction.tums.ac.ir

Health Technology Assessment in Action

Mixed-Method Study

Developing a National Accreditation Model for Cardiac-Pulmonary Rehabilitation Centers in Iran

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Abstract

Introduction: Accreditation has become more prevalent across different health system sectors, as it aims to enhance the performance of healthcare facilities. Therefore, this study aimed to develop a national accreditation model for cardiac-pulmonary rehabilitation centers.

Methods: This mixed-method study used the literature review, the Delphi technique, and quantitative methods for benchmarking excellent related accreditation models, assessing the extracted standards and measures from excellent models based on expert's perspective, conducting the pilot study, respectively. During the Delphi stage, 26 experts assessed the developed measures based on "importance" and "feasibility" criteria. The pilot phase of the model included self-assessment, external evaluation, and final improvement of the developed model.

Results: The accreditation models employed in the United States, France, and Egypt, as well as those utilized by hospitals, outpatient clinics, and primary care facilities in Iran, were considered reference models. Eleven functional dimensions were met based on benchmarking. The initial design of the model included 11 dimensions, 35 standards, and 263 measures. After eliminating 18 measures and adjusting to 34 others, the final number totaled 245. The mean scores of assessed measures in importance and feasibility criteria were 8.23 and 8.11, respectively. Subsequently, the essential components of the model were identified and developed. The performance score of the assessed rehabilitation center in compliance with standards was estimated at 0.73 and 0.23 in the self-assessment and external survey phase of the pilot study.

Conclusion: Given the model's comprehensiveness and the endorsement it has received from experts and stakeholders, its implementation is anticipated to establish a solid basis for the ongoing enhancement of cardiac-pulmonary rehabilitation centers' performance.

Keywords: Performance, Quality, Accreditation, Rehabilitation

Received: September 8, 2025, **Revised:** October 12, 2025, **Accepted:** October 29, 2025, **ePublished:** March 29, 2026

Introduction

Evaluation is a fundamental function for all managers, especially those in the healthcare fields. It is also essential in facilitating organizational advancement and attaining success. Numerous organizations in diverse fields, particularly within the healthcare sector, acknowledge the importance of evaluation processes. These organizations consistently strive to develop and implement suitable effective evaluation approaches (1, 2). Accreditation is the most widely accepted evaluation approach due to its optimum standards, emphasis on performance improvements, and cultivation of an organizational environment to enhance customer satisfaction (3). The compatibility of accreditation with the health system is further supported by the fact that it originated in the health sector, unlike other evaluation approaches, such as licensure and certification, which were imported into the health system from other sectors, including industry, services, and education (4).

Accreditation is a mechanism where in a healthcare provider is voluntarily evaluated on its capacity to deliver safe and excellent health services by a group of qualified peers from another independent organization (5). During this evaluation process, the health service provider organization becomes acquainted with the established standards and conducts a thorough self-assessment. Subsequently, the organization aligns its practices and operations to meet the prescribed requirements and standards. Once all the necessary criteria have been met, the organization undergoes evaluation by the accreditation

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organization. It is noteworthy that the concept of performance improvement develops while establishing compliance with accreditation standards and criteria (6).

With a glance to the published annual report from the World Health Organization in 2000, it becomes evident that Iran's health system needs to improve its performance compared to other nations (7). In addition, various studies have demonstrated that accreditation yields numerous beneficial outcomes in enhancing service processes, safety measures, efficiency, effectiveness, accessibility, patient and client rights, community satisfaction, and the overall quality of care. These improvements encompass various aspects, including the care environment, service provision, and the quality of care (8).

Managers and policymakers may consider using practical accreditation programs to instill a culture of continuous quality improvement and customer orientation in outpatient care if they believe that most patients in society use outpatient primary care services rather than hospitals (9). The aging of population, the alarming number of accidents, and the prevalence of chronic disorders (e.g., diabetes, heart disease, and stroke) have made rehabilitation, particularly physiotherapy and occupational therapy, one of the most essential areas of ambulatory care service provision. It should be noted that the quality and other performance metrics in rehabilitation facilities in Iran and throughout the world have improved in recent years, but this is not adequate due to the restricted nature and scope of the interventions that have been implemented (10, 11).

Objectives

Reviewing the existing literature in ambulatory care and outpatient areas, notably the facilities for cardiopulmonary disease rehabilitation in Iran, reveals the absence of a national accrediting model to evaluate centers' performance with varying dimensions and areas of service provision. Therefore, the current study seeks to develop a national accreditation model for cardiac-pulmonary rehabilitation centers in Iran.

Methods

Study Design

This mixed-methods study was performed from July 2021 to December 2022, employing various research methods at different stages tailored to the study's specific objectives.

Identifying Excellent Accreditation Models

During the initial phase of the study, the researchers aimed to identify reliable and valuable sources for modeling the accreditation model of cardiopulmonary rehabilitation centers. Therefore, they conducted a comprehensive literature review in reputable domestic and international databases/search engines, including PubMed, Scopus, Web of Science, SID, and Magiran, using the following search strategy:

((Accreditation) AND (Health) AND (Ambulatory OR Outpatient OR Clinic) AND (Rehabilitation) AND (Model OR Program OR Standard OR Measure OR Indicator))

The inclusion criteria for articles and other related evidence were limited to those written in English and Farsi and published from 2000 onwards. Data identifying a comparable accreditation model's validity and appropriateness for efficient mining/selection were selected, and an attempt was made to utilize scientifically rigorous and reputable sources. Then, the quality appraisal of the evidence obtained from the literature review was assessed using specific Critical Appraisal Skills Program tools tailored to the type of identified texts. Only texts that met the minimum criteria of the evaluation tools, achieving at least 50% of the requirements, were included in the study. The final decision regarding the appropriate reference models in developing the accreditation model was made based on obtained criteria and their related results of this phase.

Developing the Primary Model

In the subsequent phase, the researchers formulated the preliminary accreditation framework, including dimensions, standards, and assessment criteria. Moreover, the research method employed for this objective encompassed synthesizing literature review techniques, model development, and qualitative approaches (specifically, soliciting expert feedback). A comparative analysis was conducted to meet the criteria and benchmarks outlined by this functional accreditation model. This analysis focused on the performance areas of various global, Eastern Mediterranean, and Iranian reference models. The employed approach involved the utilization of a comparison matrix to assess the reference accreditation models. It should be mentioned that this matrix facilitated the evaluation of the models by considering their respective focus on various functional domains.

The process involved categorizing standards, measures, and performance indicators according to their shared content and inherent characteristics, such as those found in medical documentation. The task aimed at selecting appropriate and inclusive titles for each grouping, establishing the initial framework of the accreditation model using the identified functional and departmental areas, with a focus on priority areas, and gathering feedback on the initially compiled standards and measures from the stakeholders involved in cardiac-pulmonary rehabilitation centers (i.e., managers and personnel). In addition to the above-mentioned sources, supplementary materials were utilized to enhance the comprehensiveness of the standards/measures and inform the structure of the model format. Notably, the guidelines disseminated by the International Society for Quality in Health Care (ISQua) played a pivotal role.

Delphi Technique Phase

Subsequently, the initially compiled standards and criteria underwent examination through the Delphi technique,

supplemented by experts' insights and perspectives. The ultimate standards and criteria were established after eliminating or modifying certain elements. The research method used in this study combined quantitative and qualitative approaches, as indicated by using the Delphi technique. The Delphi technique, initially introduced by the Rand Corporation in the 1950s, serves as the chosen approach for implementing this particular objective. This technique aims to assess expert opinions and forecast forthcoming occurrences. The widespread acceptance of this method mainly stems from the fact that it allows researchers to collect feedback from specialists who are geographically or temporally separated (via the Internet or a series of questionnaires) and whose presence in the same room would be impractical for any number of reasons (12, 13). Additionally, the Delphi technique facilitates the attainment of consensus on matters that lack sufficient evidence or are characterized by significant uncertainty. Furthermore, this method employs a series of repeated rounds and systematic feedback to achieve a reliable consensus based on expert opinions. In addition, this strategy attempts to exploit the positive components of group interaction while avoiding the negative aspects associated with these groups' social difficulties, such as group thinking. As a result, the Delphi technique contains notable characteristics, such as anonymity, iteration, controlled feedback, and statistical response aggregation (14, 15).

Briefly, the process of conducting a Delphi study can be broken down into different steps, including (1) obtaining the components or cases requiring the consensus of experts through qualitative studies and evaluations and (2) developing a Delphi questionnaire based on the mentioned components or cases while considering the evaluation criteria from experts (e.g., significance, necessity, and practicability), on a 7-point or 9-point scale. Other steps were (3) providing the initial questionnaire to the experts face-to-face and via email, (4) receiving the questionnaire and analyzing the results of the first round following existing laws, (5) providing feedback on the results of the first round to the experts and allowing them to modify their scores, and (6) continuing the Delphi rounds until a final consensus is reached. In the present study, even though ten experts were sufficient to conduct Delphi (14), the researchers selected 25–30 experts to account for the potential loss of experts (reduction in the number of respondents) during the Delphi procedure.

Academic staff members formed Delphi specialists in the field of functional standards from medical science universities in the fields of physiotherapy and health management. Each expert was chosen using purposeful sampling, ensuring that the study team gets access to the most relevant and detailed data available. After completing the preceding processes, all the standards and metrics were entered into Delphi questionnaires. Then, they were prepared and presented to the experts for feedback on a 9-point scale based on importance and feasibility. The appendices section of the study includes an example of the Delphi form and the standards for reference. At this stage, the designed Delphi questionnaires were shared with the experts using face-to-face presentation for experts located in South Khorasan province and emails for experts located in other provinces. Additionally, phone conversations and email exchanges were conducted with experts to keep them involved in the study and encourage a higher response rate. After analyzing the results of each stage, questionnaires of the subsequent phases were compiled and presented to the experts. This process was repeated until a consensus was reached on the final standards.

The median index, which is less impacted by extreme or unusual answers, was employed in the Delphi study. If the median score on the questionnaires was between 1 and 4, the desired standard was deemed ineligible for further analysis and was, therefore, eliminated from the study. A passing score of 4–7 would advance the cited norm to the next round. In addition, if the final score was higher than 7, the target standard was included in the final version of the model. This section of the study also includes feedback on the results obtained in the previous round by all experts and the points each expert gave specifically to each standard, thereby allowing the expert to reflect on his own scoring and make any necessary corrections or adjustments. In the consensus process, it is determined that the consensus standard has been achieved if the difference in the scores provided by experts in two consecutive rounds of study for each question is below 15% of the total median score. In such cases, there is no requirement to include that standard in the subsequent steps of the Delphi method (16).

Providing Essential Components of the Model

The subsequent analysis identified and incorporated the essential components to develop the accreditation model. The study method utilized for this specific purpose was a literature review. This approach involved examining reference models and established frameworks within the field to inform the study's implementation. Upon examining the benchmarks set by the world's top and most prominent models, it became evident that each incorporates essential components and parts crucial for the successful adoption and implementation of their standards. The main components of an accreditation model include a content statement, measurable components, and an evaluation, rating, and accreditation approval system. Furthermore, the content statement outlines the philosophy and scope of development covered by the standard. Moreover, measurable components consist of indicators and components that facilitate the accurate measurement of the standard and enhance objectivity in reviews. Finally, all accreditation models require an approval mechanism that includes evaluation, rating, and accreditation. Following the guidelines set forth by ISQua, the prominent global accreditation body, and utilizing the obtained reference models, the essential components of the standards were merged to formulate the final model (17).

3.6. The Pilot Test Phase

During the final phase of the study, a preliminary assessment was conducted to identify and address any potential deficiencies. The current study employed a specific method that involved a combination of cross-sectional studies to evaluate pilot centers and qualitative studies in order to assess results and gather corrective feedback. Given that every innovation evolves, it is essential to acknowledge that there may initially be a discernible disparity between the theoretical aspects of the work and its practical and operational aspects. Therefore, it is crucial to thoroughly assess this gap and evaluate how the innovation can be effectively adapted to the real world. This evaluation plays a significant role in the successful implementation of the innovation. Due to this rationale, all significant, extensive, and sensitive innovations must undergo a preliminary assessment before widespread adoption and large-scale implementation, thereby ensuring that potential shortcomings are identified and addressed effectively (18). After developing the initial model, the Cardiopulmonary Rehabilitation Center of Birjand University of Medical Sciences was selected as the pilot site for the model. The model was then experimentally evaluated at this location in order to identify potential shortcomings in the standards and parameters. The process owners were involved in this evaluation, and any necessary corrective actions were taken accordingly.

To fulfill this objective, all managers and personnel at the center underwent comprehensive training on the established accreditation standards, the requisite documentation for conducting evaluations, the process of meeting evaluation requirements, and the execution of self-evaluations. After completing the self-evaluation phase, the research team conducted an external evaluation. During the pilot phase, the perspectives of managers and employees regarding the accreditation standards were also gathered through written comments in self-evaluation forms and designated spaces for feedback, as well as verbal input shared during meetings held after the self-evaluation, external evaluation, and finalization of the standards. After thoroughly examining the compiled standards and measures, appropriate adjustments and corrections were made based on the received feedback.

The internal and external evaluation phases of the pilot study heavily relied on a checklist documenting the case center's level of conformity to the standards and measures that made up the accreditation model developed for this research. The degree to which each criterion in the model was met was evaluated in this fashion and scored as "full compliance," "relative compliance," or "non-compliance" (18). The evaluation components in the checklist have been derived from the same standards and criteria approved in the Delphi study. In addition, the content validity of these components has been confirmed through the rigorous Delphi technique and the input of experts, confirming the validity of this tool. Furthermore, it is essential to note that checklists, unlike questionnaires, are specifically designed and utilized to verify scientific facts rather than gathering opinions or conducting polls. As a result, there is no requirement to assess or validate the reliability of this particular tool.

During the data analysis phase, the options of full compliance, partial compliance, and non-compliance were assigned scores of 1, 0.5, and 0, respectively. Moreover, the subsequent analyses were conducted based on these assigned scores. Additionally, the level of compliance with the standards in each case was calculated as a percentage by multiplying the points obtained for each measure, standard, field, and the total score by 100. Then, the status of the center was determined and judged in all measures, standards, functional areas, and the designed model by obtaining a score from 0 to 100 based on the defined cut-off points (18, 19).

Ethical Considerations

Primary ethical considerations were taken into account throughout this study, such as ensuring that all experts and process owners had complete autonomy in deciding whether or not to cooperate, obtaining informed consent from study participants, protecting participant confidentiality, and valuing each individual's unique contributions. Furthermore, all relevant permissions were obtained from the ethics committee, and the participants were assured of their privacy and the exclusive use of the data obtained following the study's aims.

Results

Excellent Models Identified From the Literature Review

This study identified excellent accreditation models in various specialized fields of primary health care, both in Iran and globally. Among the areas of utmost significance, the accreditation models related to hospital care, outpatient care, and primary health care and treatment are worth noting, which will be thoroughly examined in the subsequent sections.

Models of Hospital Accreditation and Their Dimensions

- In Iran, the current hospital accreditation model includes functional dimensions, such as leadership and quality management, accident and disaster risk management, human resource management and professional health, nursing service management, and health information technology and management. Other functional dimensions are environmental health, medical equipment management, provision of care to service recipients, infection prevention and control, drug management, and patient rights (20).
- The comprehensive hospital accreditation model in Iran encompasses various critical components, including but not limited to treatment accessibility and continuity, patient and family rights, patient evaluation, care provision, and medication consumption and regulation. Moreover, the enhancement of healthcare quality and safety, infection prevention and control, monitoring and management, leadership, information management,

facility administration, crisis readiness, efficient organization, and human resource management were other essential components (21).

- The hospital accreditation model in the United States, developed by the Joint Commission on Accreditation in Health Centers and its international counterpart, the Joint Committee International, has several key functional dimensions. They include access to treatment, continuity of treatment, patient and family rights, patient assessment, patient care, surgical and anesthesia care, drug use and management, patient and family education, and enhancement of patient quality and safety. The remaining dimensions are infection prevention and control, supervision, leadership and management, communication and information management, facility management and safety, as well as in-service training and professional skills (20).
- The accreditation standards of French hospitals are widely recognized as a successful and pioneering model in the field of accreditation. The above-mentioned standards has various functional areas, such as human resource management, financial resources management, informatics, infrastructure and support management, and environmental health and safety. Additionally, the other areas of focus encompass managing service quality and safety in the provision of care and treatments, implementing comprehensive risk management and quality management program, and establishing a monitoring and evaluation system. Other areas include utilizing service quality indicators and patient safety measures in the quality improvement program, ensuring patient rights and appropriate treatment, providing disease information and addressing patient satisfaction, and controlling patient pain effectively. In addition, managing end-of-life moments, maintaining accurate patient records, implementing proper patient identification protocols, and following guidelines for admitting patients and their companions. Additional areas that can be included in this list are initially examining and evaluating patients, formulating treatment plans, maintaining continuity and coordination in medical care, providing care for elderly patients, managing chronic diseases, taking care of vulnerable patients in society, handling particular conditions, and managing drugs, laboratories, and imaging. The remaining areas encompass providing health education for patients and their families, controlling the discharge process for patients, providing emergency and unforeseen care, managing operating room efficiency and invasive outpatient procedures, rehabilitation, and related activities, as well as assessing technical skills in specific cases (20).
- The Egyptian hospital accreditation model is recognized as a successful and pioneering model within the Eastern Mediterranean region. This model includes several significant functional dimensions, such as access and continuity of care, clinical safety, environmental safety, human resources, information management, management and leadership, medical records, medical staff, nursing services, patient evaluation, patient and family rights, patient care, improvement of patient quality and safety, and support services (20).

Ambulatory Care Accreditation Patterns

The accreditation model of Iran's specialized clinics is the only standard model in the field of ambulatory care in Iran and the Eastern Mediterranean region. It covers critical performance areas, such as continuous quality improvement, process-oriented promotion, safety enhancement, risk management, teamwork promotion, interdisciplinary participation, patient rights, continuity of service, and management of physical and human resources (22).

Accreditation Patterns in Primary Healthcare

- The comprehensive health center accreditation model is one of the most significant accreditation models in primary health care and treatment in Iran and the world. It encompasses various essential aspects, including access to services, community-oriented services, continuity of services, quality and safety services, service recipient rights, information management, human resource management, service efficiency, service delivery planning, service delivery evaluation, resource management, and health system research (15, 19).
- Furthermore, a model has been developed and presented for rural health and treatment center accreditation. This model focuses on key functional areas, including access to services, community-oriented services, service continuity, effective management, service quality, service safety, human resources management, information management, service recipients' rights, and specialized care (17).

Rehabilitation Accreditation Patterns

- The Commission on Rehabilitation Accreditation Facilities is a well-established international non-profit organization that operates in the health field. The institution's field of activity encompasses a range of essential areas, including elderly care, rehabilitation services, behavioral health, children and youth services, and employment and social services. This organization, which was established in 1966, operates in North and South America, Europe, Asia, and the Pacific (23).
- The Pulmonary Rehabilitation Services Accreditation Scheme is an accreditation program established in the UK in 2018. Its primary objective is to enhance the quality of pulmonary rehabilitation services. It is noteworthy that the program follows a sector model and may not address specific functional areas (24).

- The American Association of Cardiovascular and Pulmonary Rehabilitation was established to accredit hospitals that offer cardiac and pulmonary rehabilitation care. It follows a sector model and may need to address specific functional areas completely (25).

Compiling and Evaluating Primary Measures Using the Delphi Technique

The following section examines the content of all the above-mentioned patterns and, with the help of experts in the field, identifies the dimensions, standards, and functional metrics associated with cardiopulmonary rehabilitation facilities. The collected components were reclassified according to their nature, with the utmost care taken to preserve the original classifications of the reference models. Consequently, a total of 11 functional dimensions were achieved, encompassing access to services, community-oriented services, continuity of services, assessment and treatment of patients, quality and safety (specifically infection control), service recipient rights, information management, human resource management, physical resource management, service efficiency, and service delivery planning and evaluation. In addition, the original model comprised 11 dimensions, 35 standards, and 263 measures. Following removing 18 measures and modifying 34 measures, the number of domains and standards remained unchanged. However, the final model reduced the number of measures to 245 (Table 1). Additionally, the mean values of the total indices of importance and feasibility for the variables in the ultimate model were computed as 8.23 and 8.11, respectively.

Determining and Compiling Essential Components for the Model

The main components of the accreditation models, which will be discussed in detail below, were identified through an examination of the reference models and guidelines related to the design of the accreditation models. These components included the statement of purpose, the measurable elements/components (accreditation criteria), the evaluation and measurement system, the rating system of health centers, and the system for granting accreditation.

- Statement of Purpose: One of the essential components of an accreditation model is the statement of purpose, which describes the philosophy underlying the development of a standard and its scope. Accordingly, the researchers of the present study drafted a statement of purpose for each of the developed standards.
- Measurable Elements: The most fundamental components of accreditation models are indicators and components of accreditation standards that will accurately measure the standard and enhance the objectivity of assessments. Hence, measurable elements in the form of evaluation criteria were formulated for each of the developed accreditation standards. Furthermore, to increase the quality and efficiency of the developed model, experts analyzed and assessed the relevant measures rather than the original standards throughout the process of reviewing and validating the criteria using the Delphi technique.
- Evaluation/Measurement System: The yes/no scale is appropriate for determining compliance with structural/input standards, but the Likert-type rating scale (3, 5, and 7 intervals) is used for standards with a robust improvement of the quality approach, according to a review of the available scientific documents in this field. Furthermore, the level of conformity with standards can be estimated as a percentage and graded using appropriate statistical cut-off criteria. In this method, each answer option is given a proportional weight (1, 0.5, and 0 for complete compliance, partial compliance, and non-compliance). The level of conformity with each measure, standard, accreditation area, and the entire model requirements is then computed based on percentage (standard compliance).
- Rating Health Centers: ISQua's proposed approach was utilized to assign rankings for this research (Table 2); this approach categorizes accredited healthcare organizations into one of four groups, depending on how well they adhere to established criteria. An evaluated organization is given clear reasoning for its ranking, primary causes for its current state, and fundamental recommendations for improvements (18, 26).
- Accreditation Approval Mechanism: Many accrediting processes should equally weigh standards and criteria. The most important standards are referred to as core, while others are referred to as non-core. Based on the findings, the most fundamental standards/measures, which must be followed to a greater extent than others in order to be accredited, are as follows:

- Central organizational processes
- Core processes safeguarding competencies
- Processes with immediate impacts on patient safety and clinical effectiveness
- Formally approved, evidence-based standards with a clear purpose

Table 1. Confirming/Rejecting the Measures Using Delphi

Delphi Round	Number of Confirmed Measures	Number of Rejected Measures	Number of Measures Entered Into the Next Round
First	210	5	48
Second	35	13	-

Table 2. The Rating System Used in the Current Accreditation Model

Rank	Reasoning	Tips
1	Outstanding attainment of standards (Evidence of achieving standards beyond expectations) - Achieving complete or exceeding expectations of standards - Not needing any advice	- Observing improvements based on a quality improvement cycle - Observing creative improvement measures - Integrating and coordinating services beyond customer expectations - Extensively using/achieving the best performance - Managing risk/safety successfully - Having outstanding achievements
2	Adequate attainment of standards (Evidence of meeting the purpose and content of the standards) - Achieving over 60% of standards - Giving advice on maximizing promotion opportunities	- Informing the customers and employees of procedures, implementation, and documentation - Having suitable procedures, systems, and employees - Identifying and meeting the needs of customers - Observing continuous quality improvement, using evaluation results properly, and having the best performance - Establishing obligations to minimize risks - Implementing complaint and claim management processes properly and timely
3	Fairly good attainment of standards (Evidence of relative achievement and efforts toward the realization of standards) - Partially realizing (31–59%) the standards - Feeling the need to provide promotional recommendations - Being aware of risks	- Informing the customers and employees of procedures and systems; But the lack of supporting documents in this regard; Or the existence of supporting documents, but the lack of continuous implementation and the lack of awareness among customers and employees - Observing continuous quality improvements - Creating new but non-integrated processes and documentation - Feeling the need to minimize the risk in most cases
4	Poor attainment of standards (Failure to achieve standards or lack of evident efforts to achieve them) - Achieving none or a small part (less than 30%) of the standards - Feeling the need to provide promotional recommendations - Being aware of risks	- Implementing processes and systems limitedly - Lacking or observing significant defects in documentation - Ignoring customers and employees - Having non-continuous activities or no coordination - Having no minimized risk

- Standards capable of transparency in rating (18, 26).

As previously indicated, specific accreditation models assign varied values to their standards, designating some standards as core and others as non-core based on their relative values. Similarly, other models categorize and rank their standards using words like "diamond," "platinum," "gold," or "silver." Considering that the accreditation model developed during this study is brand-new and has yet to be used in practice, it is impossible to comment on the significance of its standards at this time. Instead, all the standards and measures assembled in the model are given equal weight and importance so that a logical and scientific foundation can be considered for performing the ranking in the future.

The general framework provided by ISQua for granting accreditation is as follows:

- Fulfilling all the primary standards and measures (core)
- Placing third or fourth in terms of overall conformity to standards
- Not being able to place any of the standards below a certain level

Implementing an accrediting model and making informed decisions based on the results of this implementation are necessary for establishing the primary standards and criteria. Therefore, in the current model, the criteria for awarding accreditation are "the overall status of compliance with the standards in the third or fourth rank" and "not placing any of the standards in the option of non-compliance in the proposed triple Likert-type scale."

Piloting the Developed Model

During piloting the model, "service recipient's rights" and "community-based services" were given the highest and lowest scores, respectively, in the internal evaluation, while "assessment and treatment of patients" and "quality, safety, and infection control" were given the highest and lowest scores, respectively, in the external evaluation. Furthermore, the compliance rate of the center's performance with the accrediting model's requirements and criteria in the two rounds of self-assessment and external evaluation was 0.73% and 0.23%, respectively (Table 3). Of course, substantial issues regarding the comprehensibility of various metrics and their priority and timeliness from the perspective of the self-assessment and external evaluation teams were discovered and handled.

Discussion

The accreditation model proposed in this study consisted of 11 functional dimensions, including 35 standards and 245 measures. These dimensions were developed by referencing the existing models and considering the specific activities of the intended centers. The current model demonstrates a high level of comprehensiveness, encompassing all functional dimensions outlined in reference models and the corresponding standards and metrics associated with cardiopulmonary rehabilitation centers. Table 4 compares the functional dimensions in the current model and reference models.

In the model developed in this study, the average importance and feasibility indices in the final measures were calculated as 8.23 and 8.11, respectively (on a scale

of 1–9), suggesting a high level of endorsement by the experts involved in the model. In Iran's hospital functional accreditation model (21), the outpatient care accreditation model (22), and the primary health care model (19), the average values of the above indices were 8.45 and 7.71, 7.20 and 7.53, and 7.96 and 6.96, respectively. The current model demonstrated strong performance compared to other reference models using the Delphi technique. In addition, it received the highest scores in importance and feasibility for its functional dimensions, standards, and measures, underscoring that the model holds great potential in effectively enhancing the performance of cardiopulmonary rehabilitation centers.

Various valid accreditation models have influenced the current accreditation model worldwide, including those from the Eastern Mediterranean region and Iran. It incorporates essential components, such as purpose statements, measurable elements, evaluation/measurement systems, ranking systems for health centers, and a mechanism for accreditation approval. Notably, this model has made significant advancements in these areas. When considering accreditation models, it is crucial to carefully consider these components as they play a vital role in ensuring a transparent, constructive, and beneficial assessment process (15, 18, 19, 26).

Upon reviewing the functional status of the target center in the pilot of the designed model, it was observed that the center has attained a score of 73% in the self-evaluation phase. However, the external evaluation score stood at approximately 23%, highlighting a remarkable difference of 50% between the two assessments. This issue may arise in accreditation evaluations due to two primary factors. The first factor involves the managers and employees of the center having an unrealistic perception of their performance. The second factor pertains to the need for more documentation of activities, which may hinder the center's ability to effectively demonstrate its performance's authenticity. The pilot of the accreditation model for active centers in primary health care and treatment has shown comparable results. The performance of the target center in the pilot was reported as 61% and 26% in the self-evaluation and external evaluation stages, respectively (19).

The present study had several strengths that contribute to its overall effectiveness, including utilizing a scientific and logical model in formulating and confirming the final model. This approach ensures a comprehensive and well-rounded model. Additionally, the model received high expert scores regarding its standards and metrics, further validating its quality. The study also considered all necessary components for the final model, making it clear and user-friendly.

Furthermore, users implicitly approved the model during the pilot phase, indicating its practicality and usefulness. Eventually, the study incorporated valuable inputs from experts and process owners, further enhancing its credibility and applicability. Nonetheless, one aspect that could be further improved in the study was the potential for enhancing transparency in the implementation steps and the method used to validate external reference models for review and comparison with the current model development process.

Table 3. Results of Self-Evaluation and External Evaluation Stages

Dimensions of the Accreditation Model	Self - Assessment	External Evaluation
Access to services	0.58	0.24
Community-based services	0.48	0.24
Continuity of services	0.53	0.21
Evaluation and treatment of patients	0.87	0.38
Quality, safety, and infection control	0.74	0.08
Service recipients' rights	0.95	0.29
Data management	0.82	0.30
Human resource management	0.86	0.25
Physical resource management	0.89	0.31
Service efficiency	0.65	0.11
Planning and evaluation of service delivery	0.65	0.18
Total	0.73	0.23

Conclusion

The current accreditation approach was developed using a scientific process informed by valid models, leading to

Table 4. Comparative Comparison Between the Functional Dimensions of the Current Accreditation Model and Reference Models

Excellent Accreditation Models Functional Dimensions	Hospital – The USA	Hospital - France	Hospital - Egypt	Current Hospital - Iran	Hospital Performance - Iran	Ambulatory Care	Primary Health Care	The Current Model
Access to services	✓	-	✓	-	✓	-	✓	✓
Community-based services	-	-	-	-	-	-	✓	✓
Continuity of services	✓	✓	✓	-	-	✓	✓	✓
Evaluation and treatment of patients	✓	✓	✓	✓	✓	-	✓	✓
Quality and safety	✓	✓	✓	✓	✓	✓	✓	✓
Service recipients' rights	✓	✓	✓	✓	✓	✓	✓	✓
Data management	✓	✓	✓	✓	✓	-	✓	✓
Human resource management	✓	✓	✓	✓	✓	✓	✓	✓
Physical resource management	✓	✓	-	✓	✓	✓	✓	✓
Service efficiency	-	-	-	-	-	-	✓	✓
Planning and evaluation	-	✓	✓	✓	✓	-	✓	✓

widespread support among experts and process owners even during the pilot phase. Accordingly, the researchers believe that adopting this paradigm will improve service quality and patient satisfaction at cardiac-pulmonary rehabilitation facilities. Any accrediting scheme would always require gradual evaluation based on evidence and the perspective of its stakeholders for ongoing development.

Acknowledgments

The researchers would like to sincerely thank the esteemed experts for their valuable contributions to the model's design. Moreover, they would like to express their gratitude to the managers and staff of the cardiac-pulmonary rehabilitation center for their invaluable participation in the pilot of the model. Furthermore, the National Agency for Strategic Research in Medical Education is acknowledged for its financial support. We thanks Birjand Cardiac Rehabilitation Center and Clinical Research Development Unit, Razi Hospital, Birjand University of Medical Sciences, Birjand, Iran.

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Competing Interests

The authors declared they have no conflict of interests.

Ethical Approval

This study was conducted after receiving approval from the Ethics Committee and receiving an ethical code from the National Agency for Strategic Research in Medical Education (Code: IR.NASRME.REC.1400.312).

Funding

The study was financially supported by the National Agency for Strategic Research in Medical Education.

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