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Designing a model for implementing diagnosis-related groups in Iran: An action plan approach

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Abstract

Background and Aims: Implementing diagnosis-related groups (DRGs) in different countries increases the efficiency of healthcare services, improves treatment quality, and reduces treatment costs. Due to the lack of a coherent model for its implementation, the present study aimed to develop a DRGs-based implementation action plan Model for Iran.

Methods: The present study was an applied, descriptive cross-sectional study conducted in three stages. In the first stage, a review of studies conducted in different countries was carried out. In the second stage, a model was designed for an action plan to implement the DRGs in Iran. In the third stage, the model was validated based on the Delphi technique.

Results: The DRGs-based implementation action plan model in Iran was designed in three primary axes, including the strategic approach of the DRGs-based implementation action plan, technical dimensions, and executive institutions involved in the DRGs-based implementation action plan. Validation of the designed model showed the agreement of experts (94%) for the mentioned axes.

Conclusion: The significance of tailoring a DRGs-based implementation action plan to each country's unique context is well-established. Given the intricacies of the Iranian healthcare system, we recommend an initial pilot implementation of DRGs at the hospital level, followed by a gradual national rollout.

KEYWORDS

action plan, cross-sectional, Delphi, DRGs, model

1 | INTRODUCTION

Access to healthcare services is a fundamental human need, ensuring individuals receive timely and suitable medical care, spanning primary care, specialized treatments, and hospitalizations. However, achieving equitable healthcare access is confronted by various challenges, including the utilization of diagnosis-related groups (DRGs). The progress of medical sciences and the increasing use of advanced diagnostic and treatment tools have contributed to escalating healthcare costs. As a result, healthcare financing systems play a vital role in providing affordable services to communities. To curb the rapid growth of medical expenses, reforming the healthcare financing

system becomes imperative. The financial system significantly impacts people's health and well-being, necessitating the design and modification of reimbursement mechanisms as a foundation for these reforms. By addressing these challenges and implementing necessary changes, equitable access to healthcare can be enhanced, ensuring individuals can afford and receive the care they require.[1,2]

The escalating costs of healthcare are primarily attributed to the rapid advances in medical sciences and the utilization of innovative technologies and therapies. These advancements have undoubtedly improved patient outcomes but pose significant financial challenges. The development and availability of new diagnostic tools, therapeutic interventions, and pharmaceutical treatments come with substantial research and development costs, specialized training requirements, and expensive infrastructure. Healthcare financing systems play a crucial role in addressing these challenges by ensuring the affordability and accessibility of healthcare services. However, the need for reform is evident to strike a balance between medical advancements and financial implications, promoting sustainability and equitable access to quality healthcare. Comprehensive reforms in healthcare financing systems are required to tackle the underlying drivers of cost escalation and optimize resource allocation, reimbursement policies, and coordination among stakeholders. Reimbursement mechanisms are crucial tools in upgrading and developing the health system and achieving its goals. Since hospitals are a significant part of the healthcare system, reimbursement mechanisms positively affect the proper use of hospital resources. Accordingly, there will be many benefits to the healthcare system's financial system. In many countries, improving the efficiency of hospitals allows these centers to provide better quality services by making optimal use of available resources.[3,4] Reimbursement mechanisms are divided into retrospective and prospective payments. In retrospective reimbursement, costs are calculated and paid after the service is provided, while in prospective reimbursement, it is calculated before the service is provided. One of the prospective payment systems (PPS) that has been considered in the financial system of countries is DRGs.[3,5] DRGs group patients with similar diagnoses, procedures, and demographic characteristics to establish a standardized framework for reimbursement. By categorizing patients into specific DRGs, healthcare providers and insurers can determine appropriate payment amounts based on expected resource utilization. DRGs play a crucial role in patient classification by simplifying the complexity of healthcare services, promoting fairness in reimbursement, and incentivizing cost-effective care. This system aids in optimizing resource allocation, improving efficiency, and ensuring the sustainability of healthcare delivery. The process of forming DRGs is done by dividing all the primary diagnoses under the name of major diagnostic categories (MDCs), and there are subsets of the main diagnostic classes of basic DRGs.[6] A baseline DRGs can be identified by a specific set of patient characteristics such as primary diagnosis, treatment action, discharge status, presence or absence of complications or comorbidities, age group, gender, disease severity, and birth weight at neonatal admission. Each group of DRGs has a relative value that indicates the number of resources used by patients in each group. The higher this value, the more resources are spent on treating the patient and the higher the cost for the patient.[5,7]

Thus, DRGs have been developed with the aim of being a tool to manage costs and assist hospitals and clinics in controlling the consumption and quality of services.[1] The system was first developed by Yale University in the late 1960s and was first used by the Department of Health for the State of New Jersey as a PPS in the late 1970s. The United States was one of the first pioneers in implementing DRGs, conducting extensive research and essential steps gradually and simultaneously with older systems.[4] The essential measures are grouping patients and determining relative values, which are the two main elements in implementing this system in the United States so that other elements are adapted from these two basic elements.[3] In Australia, DRGs began in the 1970s almost simultaneously with the United States in collaboration with Yale University and developed gradually over time. The key elements of the DRGs implementation action plan in this country are:

- Patient grouping based on Case-mix and calculate relative values.
- Using the International Statistical Classification of Diseases (ICD) and Related Health Problems, Tenth Revision, Australian Modification, and Australian Classification of Health Interventions (ACHI).
- Developing national financial plans for hospitals.
- Compilation and publication of Australian Refined DRGs (AR-DRGs) classification system guidelines.
- Pricing based on DRGs for inpatient and outpatient services.[8,9]

In Germany, the DRGs action plan has been implemented since 2000 to reduce healthcare costs and control costs per patient admission. The essential elements of the DRGs implementation action plan in this country are:

- Development of The International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, German Modification (ICD-10-GM) coding classification system and Operation and Procedure Classification System (OPS) measures.
- Patients grouping using Case-mix and calculating relative values.[10,11]

As an Asian country, China has been gradually implementing DRGs since 1996, along with outdated payment systems. Essential elements in this implementation are:

- Development of Beijing DRGs (BJ-DRGs).
- Standardization of patient discharge data collection.
- Determination of baseline rate and relative weight using patient discharge data
- Establishment of (CN-DRGs) and China Healthcare Security DRGs (CHS-DRGs).[8,12]

The development of the DRGs implementation action plan in Bulgaria started on a pilot basis in 2000 and was implemented in 2011. In this country, some essential elements are:

- Development of the necessary infrastructure and institutional capacities to support the implementation.
- Development of relative weights for Bulgaria.[13]

DRGs have been the primary impetus for controlling general costs. Other goals of this system are to help budget planning and improve the general financial situation in the health and social affairs sector, operation review, management, and planning. It also helps reduce future costs, optimize organizational and operational structures, and better allocate financial resources.[8,14] DRGs increase the efficiency of care services, improve the performance of the reimbursement system, stabilize the financial status of hospitals, and the possibility of estimating the length of patients' stay. In other words, predicting the patient's medical costs and financial services requires the implementation of DRGs and coordinated response by hospital departments, including the management and health information management.[15]

Given the recognized benefits of DRGs, countries worldwide are actively seeking to design specific plans for implementing DRGs. To achieve this, each country must create a clear and tailored strategic plan, known as the Action Plan, taking into account their unique needs, existing information systems, and factors such as population dispersion and access to information. This detailed plan serves as a roadmap, outlining the necessary steps to accomplish one or more goals and can be seen as a sequential series of activities that are crucial for the success of a strategic plan. Consequently, due to the imperative need for DRG implementation and the absence of an action plan in Iran, the objective of this study is to provide a comprehensive model for an action plan to implement DRGs.

DRGs hold a pivotal role in healthcare organizations by optimizing operational efficiency, managing costs, and improving patient care, all while ensuring financial stability and transparency. However, the effective integration of DRGs into a healthcare system requires a strategically designed DRGs-based Implementation Action Plan. This plan acts as a guide, facilitating the seamless incorporation of DRGs and delineating the essential steps for transitioning to a DRG-based system. Moreover, it addresses potential challenges and offers effective solutions. It is crucial to acknowledge that implementing DRGs may result in increased expenditures, potentially straining the system. Hence, a well-structured action plan is vital for effectively managing these changes. Notably, in the context of Iran's treatment systems, there has been a lack of a comprehensive action plan specifically tailored for DRG systems. Consequently, this academic paper introduces the inaugural action plan aiming to facilitate a smooth and native implementation of DRGs in Iran. On the other hand, given the limited availability of a country-specific action plan for DRG implementation in healthcare systems resembling Iran's, our research aims to bridge this gap by conducting a comprehensive study of DRG systems in developed and advanced countries. This investigation serves the purpose of not only understanding the potential applicability and feasibility of DRG systems within Iran's healthcare environment but also gaining insight into the possibilities and dynamics of Iran's healthcare system through the presentation of our proposed action plan.

2 | MATERIALS AND METHODS

The present study is an applied and cross-sectional study conducted in three stages as follows.

2.1 | Literature review

At this stage of the research, a comprehensive review of relevant articles published between 1985 and 2020 was conducted to examine the action plans implemented by leading countries in DRGs systems, such as the United States, Australia, Germany, China, and Bulgaria. The information was sourced from reputable databases including PubMed, Science Direct, Google Scholar, and Scopus. Additionally, reliable websites and library resources were consulted to obtain relevant data. The search and inclusion criteria were conducted using keywords such as "Action Plan," "Implementation DRG," "Development DRG," and "Designing DRG action plan." Despite a limited amount of global research on DRG action plans, our study utilized specific inclusion and exclusion criteria, resulting in the identification of only four studies in this field. Through a meticulous examination of these studies, our objective was to assess the current status of operational plans related to DRGs and presenting an DRG action plan for Iran Health care environment.

2.2 | Designing an action plan model for implementing DRGs in Iran

Action plans implemented in selected countries were examined to provide an action plan model. An initial model was then designed based on the primary elements of the action plan, taking into account the conditions and organizational structure of the Iranian health system.

2.3 | Model validation

The proposed model was validated in two stages using the Delphi technique. For this purpose, a researcher-made questionnaire was designed in three main areas, including the strategic approach of the DRGs-based implementation action plan, technical dimensions, and executive institutions involved in the DRGs-based implementation action plan. The validity of the questionnaire was assessed based on the validity of the content and obtaining the opinion of six health information management specialists and experts in the health insurance area. The reliability of the questionnaire was assessed using Cronbach's alpha (94%). In the first phase of the Delphi technique, to extract the views and opinions of experts, a questionnaire was given to 10 health information management specialists, all of whom were faculty members of the University of Medical Sciences. The acceptance criterion for the proposed plan was an agreement coefficient of 75%. After applying the experts' opinions on the action plan in the second phase of the Delphi technique, a panel

of experts was formed with the presence of four health information management specialists, and the proposed model was then finalized. Data analysis was performed using descriptive statistics and frequency distribution.

3 | RESULTS

A review of studies indicates that the DRGs-based implementation action plan in the study countries has improved the quality of healthcare delivery and reduced treatment costs. List No. 1 identifies the strategic approach of the DRGs-based implementation action plan, including goals, implementation method, executive processes of an action plan, laws and regulations, standards, policies, transparency, and monitoring and evaluation. List No. 2 shows the technical dimensions of the DRGs-based implementation action plan, including how to update DRGs, provide technical support for DRGs, and empower hospital systems. List No. 3 also shows the executive institutions involved in the DRGs-based implementation action plan, including the Iranian Ministry of Health and Medical Education, the DRGs specialized committee, health insurance organizations, DRGs coordinators, and healthcare organizations.

List 1. The strategic approach of the DRGs-based implementation action plan.

The strategic approach of the DRGs-based implementation action plan	Goals	• Modifying and improving the hospital repayment system • Reducing and controlling costs • Stabilizing the financial situation of hospitals • Estimating the length of stay of patients • Predicting patients' medical expenses and financial services • Improving the usefulness of health budgets • Planning the budget and balancing of hospitals, and thus improving the quality of services
	Implementation method	• Pilot implementation in several selected hospitals and modifying the processes and policies to extend it to all hospitals • Implementation at the national level
	Executive processes	• Determining the minimum data set • Designing an electronic reporting system based on the minimum data set for each discharged patient • Designing an audit system to control the relative value of costs • Case grouping[a] • Determining and calculating the relative value of costs[b] • Implementing the classification systems and designing the Grouper Software • Designing and implementing educational programs at the local and national level • Coordinating the implementation by departments and management[c] • Education[d] • Designing a costing process to extract cost data for each hospital to determine relative costs
	Laws and regulations	• Data and information confidentiality laws • Data security laws • Information management laws • Laws on how to reimburse costs in insurance organizations • Laws on how to reimburse costs in hospitals • Pricing laws for inpatient and outpatient services with DRGs and base rate release
	Standards	• Information and data confidentiality standard • Information security standard • Information quality control standard • Standards related to disease classification systems and measures
	Policies	• Data and information confidentiality policy • Data and information security policy • Policy for the development of financial and human resources at the local and national levels • Adopt appropriate policies and guidelines for the successful implementation of DRGs

	Transparency	• Transparency of processes and activities related to the action plan for all stakeholders • Defining the action plan transparently based on the needs and legal constraints of staff
	Monitoring and evaluation	• Defining and developing the necessary criteria to evaluate the work processes • Evaluating criteria at regular intervals to ensure the consistency and accuracy of DRGs • Audit processes and certify information quality to prevent upcoding • Providing feedback to make decisions and improve the plan

Abbreviation: DRG, diagnosis-related group.

List 2. Technical dimensions of the DRGs-based implementation action plan.

Technical dimensions	Information Technology (IT)	• Align IT unit strategies with DRGs implementation action plan strategies • Management and orientation of IT unit processes with hospital information system, disease and measures coding system, Grouper Software, and DRGs
	Empowerment of hospital systems	• Empowering the performance of hospital information system software according to new classification systems for diagnoses and actions • Modifying data such as MDC, diagnoses, and actions to the new DRGs system
	Updating DRGs	• Modifying and improving the organizational systems based on new technologies and organizational strategies • Updating and creating new code regularly and periodically • Updating new relative weights
	Technical support for DRGs	• Ensure software feeder system and support • Ability to upgrade to a higher level • Flexibility

Abbreviations: DRG, diagnosis-related group; MDC, major diagnostic categories.

List 3. Executive institutions involved in the DRGs-based implementation action plan.

Ministry of Health and Medical Education	• Development and implementation of DRGs implementation action plan • Identifying the financial and human resources • Management responsibilities • Development and implementation of monitoring and evaluation system • Development of policies and methods • Identifying training needs
Specialized committee of DRGs	• Establishing a specialized committee of DRGs in the Ministry of Health and Medical Education as the custodian • Organizing and implementing policies and procedures to monitor published reports
Health insurance organizations	• Providing training to insurance personnel by health insurance organizations • Calculating the relative weights and system pretests in some hospitals to gain experience and deciding on healthcare costs
DRGs coordinators	• Continuous evaluation of the quality of documentation of inpatient and outpatient records to validate audit codes • Ensure proper coding and auditing
Healthcare organizations	• Establishing DRGs implementation processes and tracking problems • Providing regular reports of the work process

Abbreviation: DRG, diagnosis-related group.

3.1 | Findings of the first phase of the Delphi technique

The results of implementing the first phase of the Delphi technique are presented in Table 1, indicating the 94% agreement of the experts with the action plan for the implementation of DRGs.

3.2 | Findings in the second phase of the Delphi technique

At this phase, the suggestions made in the first stage were applied to the plan. Then, a panel of experts with the presence of four health information management experts was formed, the proposed model was re-examined, and the desired model was finalized (Figure 1).

Based on the reviewed studies the DRG action plan model has shown positive impacts on healthcare delivery and treatment costs. The use of local DRGs has resulted in increased efficiency of healthcare services, allowing for better resource allocation and improved patient outcomes in Iranian healthcare sectors. By categorizing patients into specific groups diagnoses and procedures, our DRGs simplify the complexity of healthcare services, leading to more accurate and fair reimbursement. This promotes cost-effective care and incentivizes hospitals to optimize resource utilization. Furthermore, DRGs help control treatment costs by providing a standardized framework for reimbursement, ensuring that healthcare providers are appropriately compensated based on expected resource utilization. Overall, the implementation of DRGs has contributed to enhancing the quality of healthcare delivery while reducing treatment costs.

4 | DISCUSSION

Implementing DRGs in various countries has many benefits for the healthcare financial system, including reducing the cost of treatment, quality assurance, reducing the length of stay of hospitalized patients, and optimal use of hospital resources.[8] Accordingly, different countries sought to develop an action plan to implement the DRGs. For the first time in the United States in the mid-1970s, Prof. Fetter et al. and Thompson et al. at Yale University Health Center developed DRGs as a tool to measure the use of hospital services and quality assurance programs. The version used included 383 diagnostic groups known as DRGs, which used ICD-8 as the primary disease classification system. Australia was also the first European country to implement the DRGs action plan to develop the Case-mix program. The Australian Case-mix development plan was established and funded in 1989 over 5 years. Medicare agreements were concluded between the Commonwealth of Australia and the United States of America. It was a joint venture between major stakeholders, including states, the federal government, the clinical community, statistical agencies, universities, the public and private sectors, hospitals, and private health insurance.[2,15,16] Over time, various countries, including Germany, China, and Bulgaria, began implementing the DRGs' action plan. In Germany, one of the primary goals for this purpose was to reduce healthcare costs and control costs per admission per patient[10,11] Böcking pointed out that in Germany, government and federal agencies are responsible for medical pricing using the G-DRG system, overseen by the Ministry of Health and the Federal Medical Association. In this country, paying good money for first-class medical services is meaningless because all medical centers must provide complete services to patients. This means that in any city, state, or hospital, it is not money that saves patients but the powerful German legal system that saves the sick.[17]

China was one of the largest Asian countries to implement the DRGs. Pilot implementation of this program by Insurance BJ-UEBml began in 2003. Local versions of DRGs and pilot programs provided the basis for evaluating hospitals' performance in this country[8,12,18] Before DRGs, Bulgaria also used the Clinical Care Pathways (CCP) reimbursement method, a modified case-based payment form. The Bulgarian CCP system faced several challenges, including not covering all diagnoses and increasing treatment costs, so introducing DRGs seemed necessary. In 2011, Bulgaria used version 6 of the Australian AR-DRGs classification to provide more efficient services, reduce unnecessary procedures, and improve medical costs transparency[13,19,20]

In the proposed the DRGs-based implementation action plan model in Iran, the main goals include reforming and improving the hospital reimbursement system, reducing and controlling costs, stabilizing the financial status of hospitals, the ability to estimate the length of stay of patients, predicting patients' medical costs and financial services, improving the usefulness of health budgets, budget planning and balancing of hospitals, and thus improving the quality of services.[13,17,21] According to the Chilingerian study, the primary elements of the DRGs-based implementation action plan model in the United States are establishing a case group, determining relative cost values, Grouper Software development, training, and evaluation. The essential elements in Australia include setting a national budget to align previous activities tariffs with activities in the DRGs, publishing an AR-DRG classification system guideline, and clearly defining the types of hospital services for DRGs reimbursement.[4,12] Australian action codes to German (OPS) and converting diagnostic codes to ICD-10-GM. In addition, an audit system to control relative cost by the Institute for the Reimbursement System in Hospitals (InEK). In China, the primary elements of this plan were determining the base rate and relative weight, creating a specialized team of DRGs project, and developing grouping software based on BJ-DRGs. According to the study of Shah et al., the primary elements in Bulgaria are the gradual implementation of the action plan model for DRGs, the development of relative weights, the expansion of the capacity of executive institutions, and the development of technical issues.[10,16,18]

[a]Determining a single system for grouping patients and determining practical factors in grouping patients based on age, sex, disease severity, length of stay, patient characteristics, discharge status.
[b]Determining the existing tariffs in the country 2. Conducting more specialized studies according to the details of DRGs 3. A combination of the above two methods.
[c]Requires coordinated response from hospital departments, including hospital management, health information management, hospital financial services, information systems, and quality improvement personnel.
[d]Essential training in information technology, methodology for using DRGs reimbursement system, training of coders and doctors on how to use DRGs.

TABLE 1 Distribution of the frequency percentage of experts' opinions on the DRGs-based implementation action plan.

The main axes of the operational plan		Experts' opinions				Suggestions
		Agree		Disagree		
		Number	Percentage	Number	Percentage	
The strategic approach of the DRGs-based implementation action plan	Objectives	10	100	0	0	
	Implementation manner	8	80	2	20	Implementation will be piloted and phased in at the hospital level and then developed nationally
	Executive processes	10	100	0	0	Releasing the base rate to be done nationally
	Laws and regulations	9	90	1	10	
	Standards	9	90	1	10	
	Policies	8	80	2	20	
	Transparency	8	80	2	20	
	Monitoring and evaluation	10	100	0	0	
Technical dimensions of the DRGs-based implementation action plan	Information technology (IT)	9		1	10	
	Empowerment of hospital systems	10	100	0	0	
	Updating DRGs	10	100	0	0	
	Technical support for DRGs	10	100	0	0	
Executive institutions involved in the DRGs-based implementation action plan	Ministry of Health and Medical Education	10	100	0	0	
	Specialized committee of DRGs	10	100	0	0	It is advisable to form an advisory committee consisting of executive teams involved in the implementation of DRGs
	Health insurance organizations	10	100	0	0	
	DRGs coordinators	9	90	1	10	
	Healthcare organizations	9	90	1	10	
Total		141	94	9	6	

Abbreviation: DRG, diagnosis-related group.

The proposed DRGs-based implementation action plan model in Iran is formed in three main axes; the first axis includes the strategic approach to the DRGs-based implementation action plan, and the second axis includes technical dimensions. In the third axis, the prominent institutions of the DRGs-based implementation action plan model include the Ministry of Health and Medical Education, the DRGs specialized committee, insurance organizations, DRGs coordinators, and healthcare organizations. In most countries studied, the Ministry of Health or the government itself was primarily responsible for the DRGs-based implementation action plan. Regarding the third axis, Rajtar, in a study, considers executive institutions such as insurance companies, hospital managers, and stakeholders related to the implementation of DRGs as an integral part of the operation of this system. Chilingerian points out that in October 1983, in the United States, the responsibility for modifying and changing the definitions of DRGs was delegated to the Health Care Finance Administration (HCFA).[9,12]

In most countries, the DRGs-based implementation action plan model has been done gradually, first at the hospital level and then at the macro level. According to the proposed model, the development and implementation of DRGs can gradually be done in Iran in several phases. First, the compatibility of data between AR-DRGs requirements and data in medical records in several public hospitals will be evaluated as a pilot. Next, focus on system compatibility according to the needs of hospitals, including compliance with classifications and clinical coding and health care providers, reimbursement policies, information management systems, performance and quality management procedures, pricing, and tariffs.

The benefits of implementing DRGs in healthcare systems are well documented. Several studies have shown that the

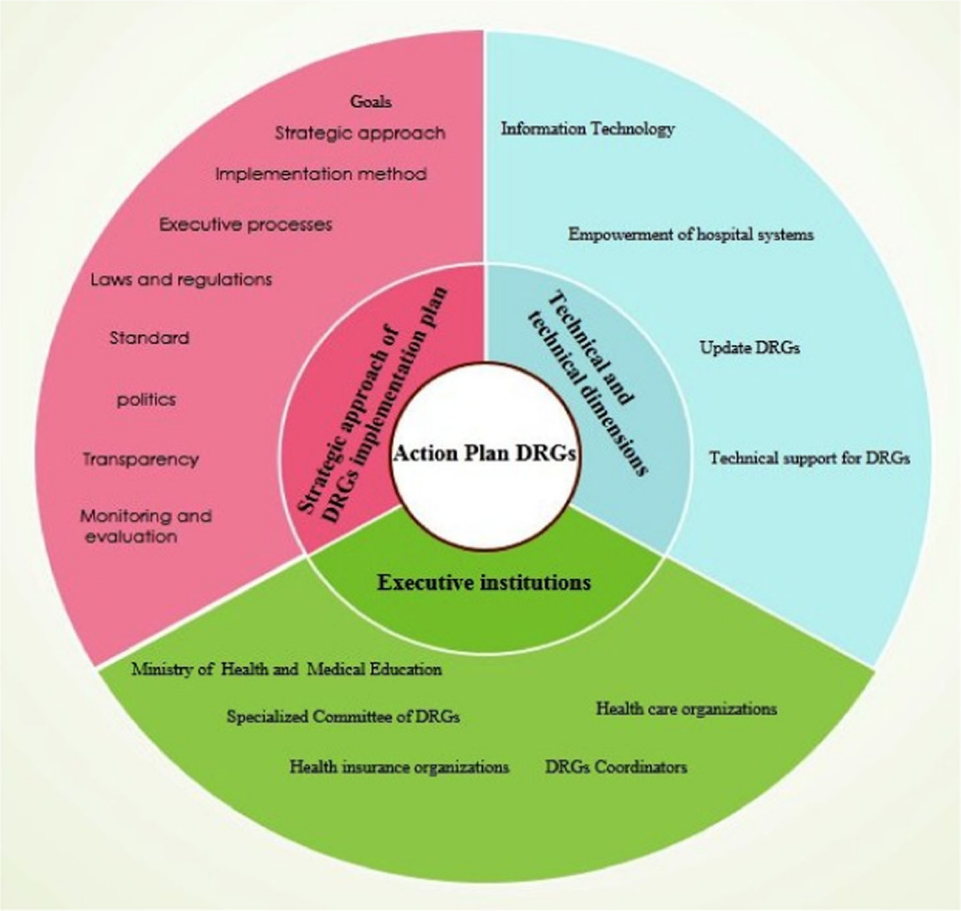

FIGURE 1 Proposed diagnosis-related groups (DRGs)-based implementation action plan.

implementation of DRGs leads to increased efficiency, improved quality of care, and reduced costs of care. So that some countries reported a 15%–20% improvement in the reduction of hospital costs, although the quality of services provided was improved or remained constant. These benefits are fully consistent with the goals of Iran's proposed action plan, which aims to improve healthcare services, optimize resource allocation, and control healthcare costs.

In the proposed model, leading institutions play a key role in the successful implementation of DRGs in Iran. Healthcare institutions in Iran must have close cooperation to achieve the successful implementation of the DRG action plan. The university institute conducts research and development of the model, while the Ministry of Health, Medicine and Medical Education provides necessary guidance and coordinates implementation efforts.

The proposed model in Iran aligns with international best practices by combining the key elements of successful DRG implementation. This emphasizes the need for a phased approach, starting with a hospital-level pilot before scaling up nationally. This approach provides the possibility of testing, modifying, and adapting to Iran's unique healthcare landscape. This model considers Iran's healthcare infrastructure, available resources, and cultural considerations to ensure its feasibility and effectiveness.

In summary, the reviewed studies provide specific examples and statistics that reinforce the benefits of DRG implementation, such as cost reduction and efficiency improvement. These benefits are fully consistent with the objectives of Iran's proposed action plan. Leading institutions involved in this model collaborate and contribute their expertise to ensure successful implementation. The proposed model in Iran is aligned with international best practices by using phased implementation and considering local conditions.

As a recommendation for future research, it would be beneficial to explore the utilization of existing technology in designing DRG models. Given the widespread adoption of artificial intelligence (AI) in medical data analysis, hospital management, and computer-assisted technology in healthcare system cost optimization,[22-25] it can be argued that AI applications are continuously advancing through the introduction of advanced algorithms and cutting-edge technologies. Therefore, it is worth considering the implementation of these algorithms to design DRG models, aiming to create a comprehensive and personalized model for each healthcare system by analyzing all relevant factors.

5 | CONCLUSION

Given the importance of DRGs in reducing costs and improving the quality of health services in all countries, an action plan to implement DRGs is an undeniable necessity. After examining and approving the

DRGs-based implementation action plan model, it is suggested to form an advisory committee consisting of executive teams involved in DRGs implementation, pilot and gradual implementation at the hospital level and then at the national level, and releasing the base rate at the national level.

AUTHOR CONTRIBUTIONS

Farkhondeh Asadi: Investigation; methodology. **Mahrokh Anvari**: Conceptualization. **Mustafa Ghaderzadeh**: Methodology; project administration; Software; supervision; validation. **Nahid Ramezan Ghorbani**: Data curation.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The survey's raw data were produced at Review and checklist validation. All authors have reviewed and endorsed the ultimate version of the manuscript. The [CORRESPONDING AUTHOR or MANUSCRIPT GUARANTOR], who had unrestricted access to all the study's data, assumes full responsibility for the data's integrity and the accuracy of the data analysis. Any derived data that underpins the study's findings can be obtained from the corresponding author [IN] upon request.

ETHICS STATEMENT

This study is approved under the ethical approval code of IR. SBMU. RETECH. REC.1400.520.

TRANSPARENCY STATEMENT

The lead author Farkhondeh Asadi affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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