

Research Paper

Challenges and Strategies for Enhancing the Effectiveness of Integrating Medical Education With the Health System in Iran

Ghasem Abedi¹ , Roya Malekzadeh^{1*}

1. Department of Healthcare Services Management, Health Sciences Research Center, School of Health, Mazandaran University of Medical Sciences, Sari, Iran.



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ABSTRACT

Background and Purpose: The integration of medical education with the health system in Iran is one of the most significant reform policies in recent years. This study aimed to explore the challenges of this integration and identify strategies to enhance its effectiveness from the perspective of key stakeholders.

Materials and Methods: This qualitative study was conducted in 2024 using content analysis based on Graneheim and Lundman's approach. The participants included 16 policymakers and senior managers from medical universities or faculties, selected through purposive and snowball sampling methods. Data were collected through semi-structured interviews, and saturation was reached when no new themes emerged. All interviews were audio-recorded, transcribed verbatim, and analyzed as meaning units. Initial codes were generated from condensed meaning units and then organized into main themes and sub-themes based on similarities and patterns.

Results: Analysis of participants' experiences identified 13 main themes and 41 sub-themes across two dimensions: challenges and strategies. The identified challenges included structural issues, deficiencies in integrated governance, misalignment between education and service delivery, increased pressure on faculty members, institutional and cultural resistance, conflicts of interest, weakened scientific convergence, and deviation from the university's core missions. The proposed strategies included reforming governance structures, developing need-based and community-oriented education, optimizing faculty roles, strengthening evaluation and accountability systems, fostering a culture of integration, and empowering managers.

Conclusion: The findings of this study indicate that despite the macro-level acceptance of integrating medical education into service delivery, its effective implementation is accompanied by structural, governance, human resources, cultural, and functional challenges. These challenges constrain the achievement of the intended objectives of integration. Accordingly, strategies such as redesigning governance structures, expanding needs-based education, and strengthening accountability and transparency mechanisms are recommended to enhance coherence and effectiveness in the integration process.

Keywords: Universities, Faculty, Medical education, Medical, Healthcare delivery, Health policy

* Corresponding Author:

Roya Malekzadeh, Assistant Professor.

Address: Department of Healthcare Services Management, Health Sciences Research Center, School of Health, Mazandaran University of Medical Sciences, Sari, Iran.

Tel: +98 (11) 33044491

E-mail: Roya.malekzadeh30@yahoo.com

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Introduction

Structural integration has been adopted in many countries as a means to synergize resources and enhance the effectiveness of service delivery systems [1, 2]. In Iran, the integration of medical education with health service provision has been one of the most significant policy transformations in the health sector over the past four decades [3]. This initiative was implemented in 1985 following approval by the Islamic Consultative Assembly, with the aim of better addressing societal health needs, mitigating shortages of specialized human resources, and improving the quality of medical education [4].

Under this policy, the newly established Ministry of Health and Medical Education assumed responsibility for education, research, healthcare, and public health. Accordingly, the structures of the former Ministry of Health and the medical education division of the Ministry of Science were merged into a single organization [5]. This led to the establishment of medical universities throughout the country, which became responsible for both delivering health services and providing medical education [6]. The overarching goal was to optimize clinical capacity, enhance the interaction between education and service systems, and align human resource training with the population's actual health needs [7].

An examination of the implementation of this policy over the past four decades reveals several notable achievements. These include an increase in medical student admissions, expansion of academic infrastructure across provinces, reduced dependence on foreign human resources, and improvements in health indicators, especially in underserved areas [8–10]. Quantitative data indicate that the number of medical schools in Iran increased from 7 to 70, dental schools from 3 to 19, and pharmacy schools from 2 to 21 between 1978 and 2014. During the same period, annual admissions to medical sciences programs rose from approximately 4,400 to over 44,000 students. In parallel, key health indicators improved significantly. Under-five mortality decreased from 178 to 16 per 1,000 live births, and infant mortality from 120 to 14 per 1,000. Life expectancy also increased from approximately 56–57 years to approximately 71 years for men and 77 years for women. Vaccination coverage also increased from approximately 20% to nearly 95%, reflecting major improvements in preventive health services [3].

Furthermore, the placement of faculty members within healthcare centers has fostered a stronger connection between education and service delivery, resulting in more practical training for students. Separating medical education and research from the Ministry of Health would likely eliminate these opportunities from the health system [11]. This proximity has enhanced the quality of clinical education [8], supported field-based research [12], and facilitated the development of community-oriented medical education programs [13].

Nevertheless, the integration process has faced multiple structural and managerial challenges. One major criticism is the lack of true coherence between the various levels of the health and education systems. In many universities, there is limited alignment between educational and clinical policies [14]. Moreover, the excessive involvement of faculty members in service delivery has undermined both the time and quality of instruction [15]. Some studies have also noted that educational and operational programs are often designed without sufficient consideration of service needs, thereby reducing their effectiveness [6, 16].

Overall, Iran's experience of integrating medical education with the health system represents a unique and thought-provoking case, both regionally and globally [17, 18]. However, to fully realize its original goals, there is a pressing need to review existing policies, redesign certain management mechanisms, and strengthen synergies between education, research, and service provision [19]. Additionally, evaluating the outcomes of this policy requires input from a wide range of stakeholders—including policymakers, service providers, and service recipients—to ensure a comprehensive understanding of its opportunities and challenges [20].

Although several studies have examined the integration of medical education and health services, most have focused on structural arrangements or policy-level aspects, giving limited attention to functional processes and the lived experiences of stakeholders. This qualitative study aims to provide a diagnostic analysis of integration in Iran and propose strategies to enhance its effectiveness. The study draws on the perspectives of key stakeholders—including policymakers in health and medical education and presidents of medical universities and faculties—offering an in-depth examination of structural, functional, and content-related dimensions of integration.

This study hopes to help identify key challenges in integrating medical education with health services, provide evidence-based strategies for senior policymakers in Iran's health system, enhance understanding of current integration processes, and inform necessary reforms to strengthen coordination, efficiency, and accountability.

Materials and Methods

Study design

This study utilized a qualitative approach with conventional content analysis. The conventional approach was selected due to the exploratory nature of the study and the absence of a predefined theory, allowing themes to emerge directly from the data. In this study, first, the challenges of integrating medical education into the Iranian health system were identified, and then strategies to improve its effectiveness were proposed from the perspective of key stakeholders.

Study population and sampling

The study population comprised policymakers in health and medical education and presidents of medical universities and faculties in Iran. Participants were purposively selected to ensure maximum variation within this expert group in managerial roles (national-level policymakers and institutional managers), years of managerial experience, and workplace location (the central headquarters of the Ministry of Health and medical universities in different regions of the country).

The inclusion criteria included at least five years of managerial experience in the health system or medical education.

Eligible individuals were first identified through purposive sampling. Subsequently, additional knowledgeable participants were recruited via snowball sampling, based on referrals from initial interviewees. Data collection continued until data saturation was achieved. Saturation was reached after 16 interviews. New codes identified per interview were as follows: Interview 14 – 3 codes; Interview 15 – 1 code; Interview 16 – 0 codes, indicating that no additional information was obtained from subsequent interviews.

Data collection

Data were collected through semi-structured interviews. The principal investigator of the study conducted all interviews. To ensure relevance and comprehensive-

ness, the interview guide was developed through a review of the relevant literature and expert consultation. The guide was pilot-tested with a few experts, and revisions were made as necessary. The interview questions focused on participants' experiences with the integration process, and key questions included:

"In your opinion, what are the major challenges and shortcomings in the integration of medical education and health service delivery?"

"What factors have contributed to the reduced effectiveness of this integration?"

"What strategies do you suggest to enhance the interaction between education and service delivery systems?"

"What recommendations do you have for improving the quality of medical education within the service delivery context?"

Participants were encouraged to freely explore various dimensions of the integration policy. Open-ended and probing questions were also employed to deepen the discussion based on participants' responses. Of the 16 interviews, 8 were in-person and 8 were conducted by phone; probing was used in 80% of cases to elicit depth. The PI, with 20 years of experience in health policy, applied bracketing to reduce bias. Interviews were conducted in a quiet setting, either in person or by phone, with prior coordination. Each interview lasted approximately 40 minutes (SD=7 minutes).

Data analysis

Following each interview, the audio recordings were transcribed verbatim. Transcripts were checked against the recordings to ensure accuracy. To ensure a systematic analysis of qualitative data, data were analyzed using the Graneheim and Lundman approach. First, transcripts were read multiple times to gain a deep understanding. Each transcript served as a unit of analysis, and meaning units—words or sentences with shared concepts—were extracted. These units were labeled and coded. Similar codes were grouped into abstract categories. Finally, through comparison and interpretation of these categories, the main themes of the study were identified.

Subsequently, to move beyond descriptive findings and develop actionable strategies, an interpretive and integrative process was conducted. The identified challenges and proposed solutions expressed by participants

Table 1. Demographic characteristics of the participants

Variables	Category	No. (%)
Gender	Male	11(68.8)
	Female	5 (31.2)
Education	PhD	16(100)
Age (y)	>50	5(31.2)
	40-50	7(43.8)
	30-40	3(18.8)
	20-30	1(6.2)
Work experience (y)	>25	7(43.8)
	20–25	6(37.4)
	15–20	3(18.8)

Note: Categories with zero participants (master's, bachelor's, 10–15 years, <10 years) are omitted from the table.

were systematically compared and synthesized. Strategies were formulated by linking recurring challenges with stakeholders' suggested actions and by interpreting the relationships among themes at a higher level of abstraction. This process resulted in a set of strategies grounded in participants' experiences and perspectives.

The coding process was conducted manually, and all data were organized and managed using MAXQDA to maintain a clear audit trail. Two independent coders achieved 90% initial agreement (Cohen's Kappa =0.83); discrepancies were resolved via consensus.

Trustworthiness of the data

To establish the trustworthiness of the qualitative findings, four criteria of Guba and Lincoln were applied: validity, transferability, reliability, and confirmability.

- **Credibility:** Enhanced through prolonged engagement (3 months, approximately 35 hours of transcript review) and member checking with 6 participants (37.5% of the sample), confirming 88% of identified themes.

- **Transferability:** Ensured by providing detailed descriptions of the study context, participant characteristics, and direct quotations.

- **Dependability:** Achieved through thorough documentation of each step of data collection and analysis, allowing for external audit.

- **Confirmability:** Addressed by consulting experts and reviewing all research documents.

Results

In the qualitative phase, the perspectives of 16 individuals—including policymakers and senior managers from medical universities and faculties across the country—were analyzed. Among the participants, 68.8% were male, and the remaining were female. All participants held doctoral degrees; most were over 50 and had more than 25 years of professional experience (Table 1).

From rich, in-depth descriptions provided by participants, 168 initial codes were extracted. The analysis of these experiences led to the identification of 13 main themes and 41 sub-themes, categorized under two overarching dimensions: (1) challenges of integration and (2) strategies to enhance integration effectiveness (Table 2).

Pathology of integration

Structural and managerial challenges

According to one of the participants, "One of the main challenges lies in the fragmented organizational structure, where unclear roles and overlapping responsibilities make effective management and decision-making extremely difficult" (participant (P) 7). Another participant stated, "Frequent changes in management, lack of stable lead-

ership, and weak coordination between departments have seriously undermined the implementation of policies and long-term planning" (P2). The theme is comprised of four subthemes: a lack of clarity in missions and responsibilities, centralization and poor delegation, duplication between education and healthcare, and inefficient decision-making structures.

Lack of clarity in missions and responsibilities

Several participants believed that the lack of clear responsibilities at various levels has led to confusion in implementation and accountability. One participant stated: "When you do not know which unit is responsible for what, you cannot be held accountable or follow up. Everything remains unresolved" (P6). Another stated: "At our university, it is unclear what the educational deputy is accountable for, and what falls under the clinical deputy; the boundaries are vague" (P13).

Centralization and weak delegation

The issue of excessive centralization and the lack of authority delegated to universities was another concern raised. One participant mentioned: "All decisions must come from the Ministry level, but at the university, we need quick and context-specific decisions" (P4). Another added: "The universities operate with very limited autonomy, as even minor decisions require formal approval" (P8).

Duplication between educational and clinical sectors

Many participants' practical experiences revealed a disconnect between the education and treatment sectors, leading to redundant work and resource wastage. A faculty member said: "The education unit has its own agenda, and so does the treatment sector; they're not in sync" (P1). Another participant with managerial experience noted: "In teaching hospitals, a single unit may follow two separate plans—one for education and one for healthcare" (P10).

Inefficient decision-making structures

The decision-making framework within the integrated education-health system was described by many as inefficient and exhausting. One participant stated: "To make a simple decision, we must pass through several filters; it is time-consuming and fruitless" (P5). Another said: "The meetings are mostly ceremonial, and decisions are either not made or not implementable" (P9).

Lack of integrated governance

In the context of integrating medical education into the health system in Iran, participants emphasized the lack of integrated governance as a fundamental barrier to effective alignment between educational and service delivery structures. According to one participant, "The absence of a unified governance structure has contributed to fragmented decision-making processes, with departments often operating according to their own policies and priorities" (P8). The theme comprises three subthemes: a lack of a unified evaluation and accountability system, weak coordination between the Ministry and universities, and the absence of defined performance indicators for integration.

Lack of a unified evaluation and accountability system

Participants emphasized the lack of a shared framework for assessing performance in the education and healthcare domains, leading to inconsistent decisions and weak accountability. One participant noted: "We still do not know how to measure the outcomes of this integration—each sector uses a different evaluation method" (P7). Another added: "We cannot identify what has worked or failed because reports are fragmented and uncoordinated" (P12).

Poor coordination between ministry deputies and universities

Multiple decision-making layers and the lack of structured interaction among the deputies for education, healthcare, public health, and development were identified as key obstacles. A faculty member said: "Sometimes, the education and clinical deputies in a university are unaware of each other's plans" (P3). Another mentioned: "We attend Ministry meetings, but when we return to the university, there is no coordination for implementation" (P13).

Lack of defined indicators for integration performance

The absence of universally agreed-upon indicators to evaluate integration success is a serious gap in the governance system. One participant stated: "Every time we ask about success criteria for integration, we get different answers" (P8). Another said: "Each university implements it differently, because there is no standardized evaluation framework" (P11).

Misalignment between education and service

This theme highlights the disconnect between educational content and the health system's actual service delivery needs. It includes three subthemes: curricula developed without regard to health needs, a gap between theoretical education and clinical environments, and weak clinical participation in education.

Curricula developed without regard to health needs

Many participants believed that medical curricula are outdated and disconnected from real-world needs. One explained: "Many of the topics we teach are suitable for 20 years ago, not today" (P1). Another participant stated: "Curricula are not designed based on the health system's needs—they mostly follow outdated references" (P14).

Gap between theoretical instruction and clinical practice

Participants frequently pointed to a lack of coherence between theoretical teaching and practical hospital settings. One said: "Until students enter the hospital, they will not realize how impractical much of what they have learned actually is" (P10). Another added: "At times, we are required to teach theoretical material that we are aware has little or no practical application" (P3).

Limited clinical involvement in education

The lack of collaboration between clinical teams and educators was a recurring concern. One stated: "Clinical staff often see education as separate and do not engage in teaching processes" (P7). Another mentioned: "Hospital managers prioritize care, and educational efforts are often just a formality" (P15).

Increased burden on faculty members

This theme addresses the challenges faculty face due to multitasking across education, research, and clinical care in the integrated system. The subthemes are: simultaneous involvement in teaching, research, and clinical practice; occupational burnout; and reduced educational quality due to clinical responsibilities.

Simultaneous responsibilities

Participants widely criticized the overload of roles, arguing that it undermined their focus and efficiency. One stated: "We are expected to teach, publish research, and engage in clinical care simultaneously, which prevents us from focusing deeply on any single area" (P6). Another added: "Faculty are expected to handle mul-

tipl responsibilities, but no time or support is given for such multitasking" (P5).

Occupational burnout

One participant explained: "We are involved in so many tasks that there is no energy left for creativity or scholarly work" (P2). Another said: "Psychological and physical burnout is clearly evident among colleagues, with many simply enduring the situation" (P15).

Decline in educational quality due to clinical burden

According to many participants, the prioritization of clinical work has affected student education. One clinical staff member shared: "When I am on the ward, I do not have time to explain things to students" (P6). Another added: "Classes are often delayed or unprepared because professors come directly from clinical duties" (P1).

Institutional and cultural resistance

This theme refers to cultural and structural barriers in accepting and implementing the policy of integration. These include: stakeholder resistance to reform, cultural differences between education and healthcare sectors, and lack of managerial knowledge in integrated governance.

Stakeholder resistance to reform

Changing structures and roles often encounter active or passive resistance. One participant said: "Any reform that disrupts existing structures naturally faces opposition, as people feel their positions are threatened" (P3). Another added: "Resistance to reform often emerges when individuals feel their interests may be compromised, and without addressing these underlying conflicts, meaningful cooperation cannot be achieved" (P16).

Cultural differences between education and healthcare

Many noted a deep cultural divide between the two sectors. One said: "Healthcare is outcome-focused, education is process-focused; this fundamental difference hinders mutual understanding" (P9). Another mentioned: "Healthcare staff often view education as a burden rather than part of their mission" (P1).

Lack of familiarity with integrated governance principles

Participants noted a significant gap in understanding governance in integrated systems. A university administrator stated: “Managers with either an educational or clinical background alone often struggle to fully comprehend the complexities of integrated systems” (P16). Another participant stated: “Decision-makers often lack knowledge of integrated governance, resulting in poor or contradictory decisions” (P11).

Conflict of interest and functional contradictions

This theme covers challenges stemming from conflicting interests among stakeholders, policymakers, and implementers across education, healthcare, and governance. The subthemes are: conflicts of interest in accrediting educational and health institutions, imbalances in medical education development, and policy/regulation conflicts.

Conflict of interest in accreditation

Some participants raised concerns about conflicts in the accreditation process. One participant stated: “Often, the evaluators are stakeholders in the same system they assess—that is a clear conflict” (P10). Another participant stated: “Accreditation bodies lack independence, making their results unreliable” (P2).

Imbalance in medical education development

Participants noted an imbalance in the development of medical education capacities. A professor said: “Resources are concentrated in a few large universities, leaving the rest marginalized” (P12). Another added: “Some policies disregard regional equity, disrupting the balance” (P5).

Conflict of interest in policymaking

Participants pointed to the influence of individuals or institutions with vested interests in the policy process. A university official said: “In many councils, members have stakes in the decisions they help shape” (P4). Another stated: “Some regulations are designed to benefit specific groups, not the broader health system” (P13).

Weakening of scientific convergence

This theme includes four subthemes: declining interdisciplinary collaboration within the Ministry of Health, weak interaction with the Ministry of Science, poor

university-industry linkage, and underdeveloped interdisciplinary research.

Weak internal interdisciplinary collaboration

Participants repeatedly mentioned a lack of cooperation across disciplines within health education and research. One stated: “Each discipline works in isolation, as if they are not meant to collaborate” (P3). Another added: “We tried an interdisciplinary project, but no unit took responsibility—it failed” (P15).

Poor collaboration between ministries

The gap between the two ministries responsible for higher education was viewed as a barrier. One said: “There is no systematic collaboration between the Ministry of Science and the Ministry of Health—each follows its own path” (P11). Another noted: “Even for a joint interdisciplinary course, getting approval from both ministries takes months” (P4).

Weak university-industry linkage

The disconnect between medical universities and industry—especially in health technology and innovation—was another concern. One participant said: “Our research never becomes product, because there is no link to industry” (P5). Another commented: “Neither the university pursues industry needs, nor industry engages university capacity—this disconnect is real” (P12).

Underdeveloped interdisciplinary research

Participants emphasized the neglect of interdisciplinary research. One participant stated: “Interdisciplinary proposals are often rejected in review boards because reviewers lack relevant expertise” (P6). Another participant said: “To get funding, the topic must be classic and discipline-specific—interdisciplinary creativity is usually dismissed” (P14).

Deviation from the academic mission

This theme includes three subthemes: excessive involvement of university management in operational tasks, expansion of responsibilities beyond the academic mission, and diminished focus on education and research.

Administrative overload of university management teams

Participants stressed that "a significant portion of university managers' time is spent on administrative tasks, diverting attention from academic priorities" (P2). One said: "Most university managers are overwhelmed with daily administrative issues instead of focusing on scientific development" (P10). Another added: "Our leadership team spends too much time on contracts and finances, leaving little room for educational planning" (P1).

Expanded responsibilities beyond academic mission

One participant noted: "Universities are now responsible for delivering healthcare services, which has diverted them from their educational and research missions" (P4). Another stated: "In some universities, clinical duties have overtaken education, causing confusion in setting priorities" (P15).

Reduced focus on education and research due to service demands

The focus on service provision has led to reduced attention to education and research. One participant said: "When most of our time is spent on clinical services, students and research suffer" (P16). Another added: "We cannot fulfill all responsibilities equally, so naturally, the quality of education and research declines" (P9).

Strategies for effective integration

Reforming governance and management structures

This theme encompasses three subthemes: the importance of revising the Ministry of Health's structure to differentiate tasks, designing a multi-level governance model at the national, regional, and university levels, and establishing joint education-treatment committees with executive authorities.

Revising the Ministry of Health's structure for relative task differentiation

One participant stated: "The Ministry of Health's roles and responsibilities need to be more clearly defined and differentiated so that each unit has a precise understanding of its duties" (P10). Another participant said: "Structural revision is the fundamental step to solving convergence problems in our system" (P14).

Designing a multi-level governance model (national, regional, university)

A university administrator noted: "A multi-level model allows us to delegate decisions to the closest level to implementation and reduces centralization" (P6). Another participant added: "This model improves coordination among different levels and prevents conflicting decisions" (P13).

Establishing joint education-treatment committees with executive authority

One participant said: "Joint committees play a crucial role in resolving conflicts and, with executive authority, can address issues more swiftly" (P9). Another commented: "When education and treatment stakeholders sit together, real cooperation opportunities emerge" (P2).

Developing needs-based and community-oriented education

This theme highlights three subthemes: redesigning educational programs based on local health needs, strengthening interdisciplinary and intersectoral education, and using real-service environments as the primary training setting.

Redesigning educational programs based on local health needs

One participant stated: "Educational programs should be designed according to the specific problems and needs of different regions, rather than following generic models" (P5). Another emphasized: "Needs-based education is the key to success in the health system" (P12).

Strengthening interdisciplinary and intersectoral education

A participant said: "If disciplines work in isolation, we cannot meet complex health needs" (P4). Another added: "Interdisciplinary education fosters creativity and collaboration among students" (P16).

Using real service environments as the main training platform

One participant noted: "Practical experience in real environments prepares students for professional practice" (P3). Another stated: "Real-life educational experiences have a greater impact than purely theoretical instruction" (P14).

Optimizing the role of faculty members

This theme stresses the necessity of defining distinct educational, clinical, and research roles for faculty, designing incentive systems aligned with their multiple roles, and reducing clinical workload for full-time educators to enhance focus and quality.

Defining distinct educational, clinical, and research roles

A participant mentioned: "Lack of clear role definitions has caused confusion among faculty, preventing optimal performance" (P11). Another stated: "We need clearly delineated tasks for teaching, research, and clinical work to optimize each area" (P8).

Designing incentive systems aligned with multiple roles

A manager said: "Incentive systems should be flexible and reward faculty proportionally for efforts in teaching, research, and clinical care" (P7). Another added: "Without proper incentives, activities become superficial and quality declines" (P12).

Reducing clinical burden for full-time teaching faculty

One participant explained: "When faculty are overwhelmed with clinical duties, they cannot fully dedicate themselves to student education" (P9). Another said: "Reducing clinical workload would allow faculty more time for research and teaching" (P14).

Strengthening evaluation and accountability systems

This theme emphasizes designing shared performance indicators between education and treatment, continuous monitoring of integration effectiveness regarding quality, satisfaction, and cost-effectiveness, and establishing data-driven systems for evidence-based decision-making.

Designing shared performance indicators for education and treatment

One participant stated: "To measure integration success, indicators that simultaneously assess education quality and clinical service delivery are needed" (P14).

Monitoring integration effectiveness in quality, satisfaction, and cost-effectiveness

Another participant said: "We must regularly evaluate satisfaction among students, patients, and staff, as well as monitor costs to maintain balance" (P8).

Establishing data-driven systems for evidence-based decision-making

One participant remarked: "Information systems that accurately collect and analyze data are key for timely and effective decision-making" (P16).

Promoting culture and empowering managers

This theme covers: training managers and decision-makers in integration and health governance, fostering a culture of participation, flexibility, and shared responsibility, and documenting successful domestic and international experiences for benchmarking.

Training managers and decision-makers in integration and health governance

One manager said: "Continuous training in integration helps make better decisions and prevents confusion" (P13). Another participant noted: "Lack of specialized knowledge in this area is our biggest managerial challenge and must be addressed through targeted training" (P7).

Fostering a culture of participation, flexibility, and shared responsibility

One participant stated: "When a participatory culture prevails, individuals become more responsible and cooperation increases" (P9). Another added: "Flexibility and openness to diverse opinions are keys to creating a healthy environment for group decision-making" (P11).

Documenting successful domestic and international experiences for benchmarking

One participant emphasized: "Accurate documentation of successful experiences helps replicate effective approaches and avoid mistakes" (P15). Another added: "By studying successful cases at home and abroad, we can implement better and more efficient strategies" (P5).

Table 2. Extracted themes of pathology and strategies to strengthen the integration of medical education in service delivery

Dimension	Main Theme	Subthemes
Pathology	Structural and managerial challenges	• Lack of clarity in the missions and responsibilities across different levels of the ministry and universities • Centralization and weak delegation of authority to universities • Parallel work between educational and treatment sectors • Inefficient decision-making structures at ministry and university levels
	Deficiencies in integrated governance	• Absence of a unified evaluation and accountability system between education and treatment • Poor coordination among ministry deputies and university levels • Lack of defined indicators to measure integration performance
	Misalignment between education and service	• Curriculum design without regard to actual health system needs • Gap between theoretical education and clinical environment requirements • Lack of active participation of the treatment sector in educational processes
	Additional burden on faculty members	• Concurrent involvement in educational, research, and clinical activities (multiple roles) • Job burnout due to task overload • Decline in education quality due to extensive clinical responsibilities
	Institutional and cultural resistance	• Stakeholder resistance to structural changes • Organizational culture differences between education and treatment sectors • Lack of managerial familiarity with integrated governance principles
	Conflict of interest and functional contradictions	• Conflict of interest in accreditation of educational-treatment institutions • Conflict in balanced development of medical education • Conflict of interest in policymaking and regulations
	Weakening of scientific convergence	• Weak interdisciplinary convergence within the Ministry of Health • Poor communication between Ministries of Health and Science • Weak linkage between universities and industry • Fading interdisciplinary research
	Deviation from university mission	• Excessive involvement of university management in administrative tasks • Expansion of university responsibilities beyond academic mission • Decreased focus on education and research due to involvement in service provision
Strategies for strengthening effectiveness	Reforming governance and management structures	• Revising Ministry of Health's structure for relative task differentiation • Designing multi-level governance model (national, regional, university) • Establishing joint education-treatment committees with executive authority
	Developing needs-based and community-oriented education	• Redesigning educational programs based on local health needs • Strengthening interdisciplinary and intersectoral education • Using real service environments as the main training platform
	Optimizing faculty roles	• Defining distinct educational, clinical, and research roles • Designing incentive systems aligned with multiple roles • Reducing clinical workload for full-time teaching faculty
	Strengthening evaluation and accountability systems	• Designing shared performance indicators for education and treatment • Monitoring integration effectiveness across multiple dimensions • Creating data-driven systems for evidence-based decision-making
	Promoting culture and empowering managers	• Training managers and decision-makers in integration and health governance • Promoting a culture of participation, flexibility, and shared responsibility • Documenting successful domestic and international experiences for benchmarking

Discussion

Based on the analysis of participants' experiences, 13 main themes and 41 sub-themes were identified in two dimensions: pathology and strategies to strengthen the integration of medical education into service delivery. Despite the acceptance of this policy at the macro level, the study findings indicate that achieving its goals faces structural challenges, deficiencies in integrated governance, misalignment between education and service,

excessive pressure on faculty members, institutional and cultural resistance, conflicts of interest, weakening of scientific convergence, and deviation from the academic mission of universities. These challenges threaten the effectiveness of integration unless strategies such as reforming governance structures, developing needs-based, community-oriented education, optimizing faculty roles, strengthening evaluation and accountability systems, and fostering a culture and capacity-building for managers are adopted.

At the structural level, the most significant identified pathology is centralization and ambiguity in the missions of various levels of the Ministry and universities. This has resulted in parallel work, overlapping responsibilities, and slow decision-making processes. Our findings align with previous studies that highlight centralization and weak delegation as key factors weakening integration [9, 10, 16]. Experiences from other countries also show that multi-level governance models, with delegated authority to universities and regions, have played an effective role in the dynamism of integrated systems [21–23]. Accordingly, designing structures such as joint education-service committees with executive powers can enhance managerial coherence and reduce structural fragmentation [24–26]. These findings indicate that centralization and ambiguity in governance structures limit the effectiveness of integrating medical education with health services and reduce institutional accountability. Therefore, establishing joint governance mechanisms with clearly defined delegated authority can enhance managerial coherence and reduce structural fragmentation.

In the governance dimension, the absence of an integrated accountability system and of specific performance indicators to evaluate the effectiveness of integration is a major barrier for policymakers. The study revealed that without reliable data and regular monitoring systems, a realistic assessment of integration outcomes is impossible; a point emphasized in other studies as well [27–29]. Designing data-driven systems to record and analyze educational and service performance is considered a key strategy for evidence-based decision-making [30, 31]. These findings indicate that the lack of integrated accountability and clear performance indicators limits policymakers' ability to guide and evaluate the effectiveness of integration. Therefore, establishing data-driven systems and regular monitoring mechanisms is essential for evidence-based decision-making and improving the performance of the integrated medical education and health systems.

From the perspective of the alignment between education and service, the results indicate that the gap between theoretical education and real-world service environments remains. Designing curricula without the active participation of healthcare centers has led to reduced clinical preparedness among students and lower learning quality, as underscored by other research [10, 32–34]. Successful international experiences have shown that using real service environments as the primary educational setting (such as the COBES model in Africa) helps improve students' clinical skills and social responsibility [35].

The role of faculty members is also a key factor in the success or failure of integration. The findings show that the multiplicity of roles (educational, research, clinical) and high workload cause burnout, decreased motivation, and reduced teaching quality; an issue also identified as a threat to effective workforce training in domestic studies [36–38]. This is also consistent with global evidence, as systematic reviews have shown high and variable levels of burnout among physicians, largely attributed to heavy workload, role overload, and lack of standardized workload definitions [39]. Designing a performance-based incentive system, clearly defining roles, and reducing clinical burdens for full-time academic staff are among the proposed strategies to optimize faculty roles in the integrated system [40–42].

In the cultural and institutional dimensions, resistance to change, differences in organizational culture between the education and service sectors, and managers' unfamiliarity with integrated governance principles are major obstacles to effective policy implementation [43–45]. Continuation of this situation leads to the persistence of parallel and suboptimal structures. Studies emphasize that without managerial training, promoting a culture of participation, and documenting successful experiences, systemic change will not be achievable [46, 47]. Brownfield et al. (2020) also emphasize that changing managerial attitudes is the first condition for synergy between education and service [48].

Furthermore, conflicts of interest at the policy level, weak scientific convergence, and universities' deviation from their academic mission were other identified pathologies. Managers' engagement with executive and service issues has reduced their focus on education and research, endangering the scientific nature of universities [2, 9, 16]. Ebrahim Nia et al. described staff and line conflicts as a weakness in the integration plan [16]. Deviation from the research mission, highlighted by Majdzadeh et al., was attributed to excessive emphasis on service delivery [9]. This study also pointed to weak scientific convergence and insufficient linkage between research and practice as barriers stemming from managerial weaknesses; even when linkages exist, they are ad hoc and unsystematic, with undefined connections between academics and executive domains [9]. Rahnavard's research also stresses the importance of conflict and dispute management in successful integration, consistent with our findings [2]. The results of this study, which are consistent with previous findings, indicate that conflicts of interest, weak scientific convergence, and deviations from the research mission limit the capacity of universities and policymakers to achieve effective integration of medical education and health services.

Although this study was designed and conducted nationally and included key groups of policymakers and service providers, it still has limitations. First, despite relative participant diversity, some influential groups such as students, patients, and civil society representatives were not included. Second, reliance on qualitative and experiential data may introduce individual or organizational biases. Third, due to the qualitative nature of the study, the findings cannot be precisely generalized to the entire health and medical education system in the country. Nevertheless, the use of theoretical saturation and rigorous content analysis enhanced the internal validity of the findings.

Conclusion

Although the integration of medical education with the health system in Iran has brought benefits in infrastructure development and educational capacity, it continues to face structural, managerial, and cultural barriers that may limit the achievement of its long-term objectives. The findings of this study indicate that centralization, lack of integrated governance, misalignment between education and service, excessive workload on faculty members, and the gap between theoretical training and real-world health system needs are among the main challenges. However, the study provides a clear policy implication: redesigning governance structures, defining clear faculty roles, developing needs-based education, strengthening accountability mechanisms, and empowering managers can significantly enhance the effectiveness of integration. Ultimately, the sustainable success of this policy requires a multi-level and participatory approach, leveraging real-world data and learning from successful international experiences, enabling the implementation of gradual yet fundamental reforms in structure, organizational culture, and evaluation systems.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of the [National Agency for Strategic Research in Medical Sciences Education \(NASR\)](#), Tehran, Iran (Code: IR.NASRME.REC.1403.097). All participants provided informed consent prior to participation, and data confidentiality and anonymity were strictly maintained throughout the study.

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Authors contributions

Conceptualization, supervision, investigation and writing: All authors; Methodology, data collection, data analysis, and funding acquisition and resources: Roya Malekzadeh.

Conflict of interest

The authors declared no conflict of interest.

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