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Original Article

# Analysis the Integration of Medical Education with the Provision of Healthcare Services in Iran with a SWOT Approach

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## Abstract

**Background:** The integration policy was designed and to enhance the bilateral interaction and accountability between the medical education system and the national health system, culminating in the establishment of the Ministry of Health and Medical Education.

**Objectives:** The present research aims to critically examine the integration of medical education into healthcare service delivery using the Strengths, Weaknesses, Opportunities, and Threats (SWOT) framework.

**Methods:** This qualitative study was conducted in 2023. Participants included 22 health system policymakers and managers in the country with a managerial background in universities of medical sciences in the country's District 1. Data were collected using semi-structured interviews through purposive and snowball sampling methods until data saturation was reached. Questions were asked about the experience of integration and the SWOT of the program. Subsequently, the interviews were transcribed, semantic units were determined, and the themes' coding, categorization, and identification were conducted. Finally, the data were analyzed using content analysis.

**Results:** The analysis of experiences yielded 14 main themes and 42 subthemes. The main themes encompassed "self-sufficiency in health human resources, expansion of educational fields, enhancement of social accountability, growth of educational and health indicators, improvement of the connection between education and services, development of applied research (strengths), weakened interdisciplinary convergence, deviation from the educational and research mission, conflict of interest (weaknesses), support of laws and regulations for integration, expansion of international interactions (opportunities), incomplete understanding of integration, emergence of new educational approaches, political and social pressures (threats)."

**Conclusion:** The integration of the medical education system and the health system is a complex process. This plan has not performed successfully in providing qualified human resources, improving service indicators, and expanding the scope of medical education in the country. It is recommended to select appropriate strategies to maximize the program's strengths and opportunities and minimize its weaknesses and threats.

**Keywords:** Medical Education; Integration; Healthcare Service Delivery; Health System

## Background

The health system faces numerous challenges in different countries, including the provision of a qualified human resources, efficient use of health resources, and facilitating people's access to health services (1). Providing the necessary human resources for the health sector is considered one of the responsibilities of the health system, alongside the three responsibilities of financing, governance, and service delivery, according to the World Health Organization (WHO) (2). In Iran, the training of healthcare professionals underwent significant transformations. Following a report by the

Cultural Revolution Headquarters, tasked with reviewing and developing university programs, on quantitative and qualitative issues in the country's medical education, the Iranian Parliament passed a law of integrating education and research into Iran's former Ministry of Health in 1985, leaing to the establishment of the Ministry of Health, Treatment, and Medical Education. According to this law, all the authorities of the Minister of Health and Welfare, as well as a portion of the duties and authorities of the Minister of Culture and Higher Education related to health, treatment, and medical education and research, were transferred to the minister of this ministry (3,4), and a unified structure was established under the title of University of Medical Sciences and Health Services, which was responsible for service delivery in the fields of health, treatment, education, and research in medical sciences (5).

Some of the primary reasons for the adoption of the plan of integrating medical education and healthcare services, as well as the establishment of the Ministry of Health, Treatment, and Medical Education, include the shortage of physicians relative to the population, the risks to individuals' health, particularly in deprived and underserved areas, and the shortage of educational facilities in the Ministry of Higher Education to train the required number of physicians (6). Increasing the number of qualified healthcare professionals (7), optimal utilization of the country's medical facilities for the provision of healthcare, medical education and research, expansion of universities, utilization of more clinical and educational facilities in medical education, and the alignment of medical education with the real problems and needs of society, as well as the collaborative management between the education and service delivery sectors, are among the goals of this plan (8,9).

There is disagreement about the success of this plan, and its implementation has both supporters and opponents (10). Education in the Ministry of Health is distinct due to the importance of the health services issue and the close integration of educators with service providers in health service delivery centers. Moreover, the presence of faculty members in healthcare service centers enables them to become familiar with the challenges of these centers and to provide more practical education to students. Separating medical education and research from the Ministry of Health would deprive the health system of this opportunity (11). On the other hand, the excessive involvement of faculty members in the care process, neglecting medical education, and the influence of healthcare policymaking on educational programs (12) have culminated in a weak interaction between the educational system and the service delivery system during students' internships (13).

Some studies have indicated a gap between the plan's practical implementation and its intended goals (10). Despite the integration of education and service delivery at the deputy level, complete integration across all educational, healthcare, and managerial levels has yet to be achieved, and many processes in these two areas are still developed and implemented without considering each other's needs (7). On the other hand, some studies have highlighted the numerous benefits of the integration plan. Proponents of the plan believe that it will lead to more research in the fields of public health and community-based medical education, improve the country's health status, particularly in rural areas, remote regions, and less developed provinces (14), increase the number of admissions in all medical fields, improve the physician-to-population ratio (15), enhance utilization of specialized faculty members in treatment and education, and consequently, cause a more equitable distribution of human resources and medical equipment across the country (12).

Given the uniqueness of this experience worldwide, limited research has been conducted to investigate and report on the outcomes of implementing the integration plan in Iran, and the various dimensions of integration have not been thoroughly analyzed (7, 16, 17). Additionally, in the analysis of any plan or program, all internal and external aspects must be taken into account. One model that can be used to evaluate the implementation and performance of such a plan is the Strengths, Weaknesses, Opportunities, Threats (SWOT) approach. Accordingly, an appropriate strategy maximizes the strengths and opportunities of a program while minimizing its weaknesses and threats (18). Therefore, the current study aims to investigate the integration of medical education and healthcare services using the SWOT approach. It is hoped that the findings of this research will provide policymakers and senior managers of the health system with valuable information to reform the governance structure of the Iranian health system.

## Objectives

The present research aims to critically examine the integration of medical education into healthcare service delivery using the Strengths, Weaknesses, Opportunities, and Threats (SWOT) framework.

## Methods

This study was conducted using a qualitative approach and content analysis. The study population consisted of policymakers and managers of universities of medical sciences in the country's District 1 in 2023. The inclusion criteria for the study included policymakers and managers of universities of medical sciences in the country's District 1 with at least five years of managerial experience and a willingness to participate in the research. To this end, key individuals were purposively identified based on the research objectives and for the purpose of collecting viewpoints. Subsequently, a snowball sampling method was employed whereby additional experts were identified based on the recommendations of the initial individuals who met the inclusion criteria and were purposefully selected. In total, interviews continued until data saturation was reached.

In-depth, semi-structured interviews were conducted to gather expert viewpoints. An interview guide was developed to facilitate the interviews. In designing this guide, a comprehensive literature review was conducted, and several experts in this field were consulted. Subsequently, to determine the validity and ensure the meaningfulness of the questions from the respondents' perspectives, multiple experts were interviewed; based on their feedback, the required modifications were made to address any shortcomings. The questions focused on the experience of integration and the SWOT of the law. In the interviews, participants were allowed to freely explore the medical education integration plan. They were asked: "What comes to your mind regarding the strengths and weaknesses of the medical education integration plan?" "What concepts (examples) can contribute to increasing the opportunities of the medical education integration plan?" "Please state the threats to the medical education integration plan." and "Please share your experiences with the medical education integration plan." During the interview, the focus was on guiding the participant toward a critical analysis of the medical education integration plan. When clarification was required on specific topics, more targeted questions were employed. Follow-up and exploratory questions were posed based on the data provided by the participants to elucidate concepts and delve deeper into the interview process.

Interview times were scheduled in advance and coordinated with the participants either by phone or in person. Additionally, while providing explanations about the purpose of the interviews, participants were assured that their data and statements would be kept completely confidential. Furthermore, they were informed that despite their initial consent, they could withdraw from the interview at any time they wished. Subsequently, a written informed consent form was sent to all individuals who had voluntarily agreed to participate. In order to enhance issues related to the validity, accuracy, and confidentiality of the interview content, an attempt was made to provide a quiet and secluded place away from the workplace noise for conducting the interviews. Moreover, the mean duration of each interview was considered 45 minutes with a standard deviation of 10 minutes.

Immediately following each interview, the data were summarized (summaries encompassed the interviewer's interpretation of the key ideas discussed in the interview). The recordings were then listened to and their content was transcribed. At the end, the handwritten notes were examined for checkbook content. For the content analysis, the qualitative approach developed by Graneheim and Lundman (19) was employed.

*Data Reliability and Validity:* In order to ensure the accuracy and robustness of the study, the criteria proposed by Guba and Lincoln (20) were used. Through long-term engagement and sufficient interaction with participants, the researcher sought to enhance the credibility of the research by collecting reliable data and obtaining participants' confirmation. A step-by-step iterative process was employed, along with data collection and analysis, and rigorous review by the supervisor, advisor, and experts to enhance data reliability. The faculty members' confirmation and their additional comments were utilized to enhance the data credibility. Data transferability was examined by striving to provide a rich description of the research report, as well as direct quotes from participants exactly as stated.

## Results

In the qualitative section, the opinions of 22 policymakers, managers, and health system experts with managerial experience in the Ministry of Health or universities of medical sciences in the country's District 1 were used. Seventy-seven percent of the participants were male and 23% were female. Most participants (91%) held a doctoral degree, while the rest (9%) held a master's degree (Table 1).

**Table 1**. Participants' demographic characteristics in the analysis of the integration of medical education and health service delivery

| Component | | Frequency (%) |
|---|---|---|
| Gender | Male | 17 (77.0) |
| | Female | 5 (23.0) |
| Education | Doctoral | 20 (91.0) |
| | Master | 2 (9.0) |
| | Bachelor | 0 (0) |
| Age (year) | Over 50 | 18 (81.8) |
| | 40-50 | 3 (13.7) |
| | 30-40 | 1 (4.5) |
| | 20-30 | 0 (0) |
| Work experience (year) | Over 20 | 12 (54.5) |
| | 20-25 | 6 (27.3) |
| | 15-20 | 3 (13.7) |
| | 10-15 | 1 (4.5) |
| | Under 10 | 0 (0) |

The participants' rich and deep descriptions yielded 320 primary codes. Through the analysis of participants' experiences, 14 main themes and 42 subthemes were also extracted. Six themes were identified as strengths: "Self-sufficiency in health human resources, expansion of educational fields, enhancement of social accountability, growth of educational and health indicators, improvement of the connection between education and services, and development of applied research." Three themes were identified as weaknesses: "Weakened interdisciplinary convergence, deviation from the educational and research mission, conflict of interest." Three themes were identified as opportunities: "Support of laws and regulations for integration, a positive view of integration, and expansion of international interactions." Finally, three themes were identified as threats: Incomplete understanding of integration, emergence of new educational approaches, and political and social pressures" (Table 2). Additionally, all the identified themes were illustrated through a SWOT diagram to better understand the topic (Figure 1).

## Strengths

*Self-Sufficiency in Health Human Resources:* According to most participants, the responsibility of the Ministry of Health in the education and training of medical science human resources resulted in a genuine understanding of the shortages of human resources in the healthcare field. Self-sufficiency in health human resources was one of the obtained themes, encompassing three categories: "Increased capacity for human resources training, independence from foreign manpower, and provision of the necessary workforce for deprived areas."

***Increased Capacity for Human Resource Training:*** Nearly all participants identified the increased number of medical science graduates as a strength of the medical education and service delivery integration plan. From a participant's perspectives, "*Following the integration, the number of student admissions increased significantly. Subsequently, educational institutions for medical education expanded rapidly, facilitating the expansion of disciplines in various programs. As a result, the country achieved self-sufficiency in its health human resources*" (Participant 14). Another participant stated, "*Since the Ministry of Health is itself responsible for service delivery and education, we have witnessed a positive intersectoral effort to utilize all its facilities and centers in order to increase the training of medical and nursing students*" (Participant 6).

***Independence from Foreign Manpower:*** Most participants cited independence from foreign manpower as one of the strengths of the integration plan.

One participant stated, "*This increase in the number of medical staff and disciplines has made us independent of foreign physicians*" (Participant 18). Another participant stated, "*Perhaps the younger generation does not remember, but not so long ago, I remember that we had many Pakistani, Indian, and Bangladeshi doctors in the country; fortunately, we do not need them anymore*" (Participant 14).

***Provision of the Necessary Workforce for Deprived Areas:*** Most participants stated that the presence of healthcare professionals, such as physicians, nurses, midwives, and others, in all regions of the country is currently one of the achievements of the health system. As one participant stated, "*Until three or four decades ago, physicians were only located in large cities and capital cities. People had to endure significant time, expense, and travel difficulties to seek treatment for themselves or their loved ones*" (Participant 7). Another participant stated, "*In all cities, even the most remote ones, we have specialized workforce, and this is a great blessing*" (Participant 1).

*Expansion and Ownership of Educational Fields:* Participants believed that with the integration of the educational system and health service delivery, the educational system could potentially take owner of as many educational fields as there are healthcare facilities in the country. Expansion and ownership of educational fields was another theme that emerged, comprising

three categories: "Establishment of educational fields in the country's healthcare networks, increased number of educational hospitals and beds, and the possibility of using more paraclinical spaces."

***Establishment of Educational Fields in the Country's Healthcare Networks:*** Participants believed that the integration law culminated in an increase in the educational infrastructure of the country's medical sciences, such that with the increase in this infrastructure, a chain of growth in student admissions and diversity of educational cases was experienced. One participant stated, "*The integration provided a platform where health centers, whether rural or urban, and even local healthcare centers, could be viewed as educational fields*" (Participant 8). Another participant stated, "*Perhaps if the integration had not happened, this golden opportunity would not have arisen*" (Participant 5).

***Increased Number of Educational Hospitals and Beds:*** Participants stated, "*After the integration, we had a lot of good treatment hospitals that could potentially be converted into educational centers and were under the ownership of a unified system that could utilize them as needed*" (Participant 10). "*The possibility of medical students' presence in a greater number of educational centers enables them to benefit from more cases, which in turn improves the quality of clinical training*" (Participant 2).

***The Possibility of Using More Paraclinical Spaces:*** Most participants identified the integration law as a turning point for the expansion of paraclinical spaces, such as pharmacies, laboratories, and imaging centers, at the level of networks and hospitals. For instance, one participant stated, "*Perhaps what is really important is to provide a space for other medical science students, such as students of various health sciences, who require their own specific spaces within the healthcare networks, and integration can help expand the scope of education to the entire health system and beyond, even to the entire country*" (Participant 12).

*Enhancement of Social Accountability:* Participants believed that the integration law incorporated social accountability into medical professional education and made them more responsible toward patients. The enhancement of social accountability was another obtained theme, consisting of three categories: "Breaking down the barriers of medical schools, accountability to societal expectations in the health sector, and the possibility of student presence at all levels of service delivery."

***Breaking Down the Barriers of Medical Schools:*** From the participants' perspectives, "*When education was integrated with healthcare service delivery, the medical school was no longer solely responsible for education. Instead, they, along with their faculty members, provided services in educational centers. In essence, the medical school was no longer separate from society*" (Participant 14). "*When a faculty considers itself a stakeholder in the health system, it feels a greater sense of responsibility toward patients, and this feeling is also transmitted to other departments*" (Participant 17).

***Accountability to Societal Expectations in the Health Sector:*** Many participants acknowledged, "*Universities of medical sciences in the country have a suitable geographic distribution, and each is working to address the specific problems of the intended region*" (Participant 17). In this regard, one of the participants stated, "*Given that there is now at least one university of medical sciences in each province responsible for the people's health affairs, it is certain that all research and education will be directed toward meeting the needs of the community*" (Participant 22).

***The Possibility of Student Presence at All Levels of Service Delivery:*** Most participants considered the breadth of the educational field and planning for their presence at various levels to be important. They suggested, "*Integration has made it possible for students to be present at all levels of service delivery, including primary, secondary, and tertiary care, rather than solely in hospitals. This has fostered a sense of accountability among them*" (Participant 3). "*The fact that the student is present in a local healthcare center or health center allows them to become intimately familiar with the broadest and most primary level of the country's healthcare network, where they are also expected to work in the future*" (Participant 19).

*Growth of Educational and Health Indicators:* One of the findings obtained from the analysis of the interview data was the growth of educational and health indicators, comprising three categories: "Increased number of medical science education programs, increased number of educational and therapeutic institutions and centers, and development of primary healthcare services."

***Increased Number of Medical Science Education Programs:*** According to the participants, "*Following the integration, we observed a significant increase in the number of academic programs offered*" (Participant 1). "*I remember when we were studying, only a few universities*

*in the country offered specialized or PhD programs*" (Participant 7). "*Since each province must now have at least one university of medical sciences, these universities are training health professionals at least in the main health system fields, such as medicine, nursing, and midwifery, which in itself means an increased number of fields in the country*" (Participant 5).

***Increased Number of Educational and Therapeutic Institutions and Centers:*** Participants stated, "*One of the significant achievements of the integration law can be considered the expansion of educational infrastructure and facilities, such as educational centers and training beds*" (Participant 22). "*While before the integration, there were only a few medical schools in the country (just 9 medical schools, 4 dental schools, and 3 pharmacy schools), the integration resulted in at least one university of medical sciences in each province and multiple universities of medical sciences in most provinces*" (Participant 14).

***Development of Primary Healthcare Services:*** One of the participants stated, "*The integration law, along with human resource training, has led to the development of the country's healthcare network*" (Participant 5). Another participant remarked,

Integration improved healthcare human resource planning, such that by increasing student admission capacity requested by the health system, it resulted in the development of human resources in the primary healthcare sector. This, in turn, led to the expansion of healthcare services, such as vaccination, mortality control, and control of communicable diseases, in the country (Participant 15).

*Improvement of the Connection between Education and Services:* Participants believed that integration led to establishing a close connection between the service delivery and medical education sectors. Improvement of the connection between education and services was another emerged theme, encompassing three categories: "Using healthcare service facilities for educational purposes, using the capacity of faculties to meet the health workforce needs, and proximity and communication between faculty members and health managers."

***Using Healthcare Service Facilities for Educational Purposes:*** Participants stated, "*The integration of the education system and the service delivery system has brought two separate entities together as a unified whole, facilitating mutual growth*" (Participant 16). Many participants believed, "*Integration has provided an opportunity for education to benefit from the healthcare facilities of the service delivery system, utilizing beds, equipment, physical space, and even personnel for educational purposes*" (Participant 1).

***Using the Capacity of Faculties to Meet the Health Workforce Needs:*** Participants believed, "*The education-service delivery relationship was mutual: As much as education benefited from this integration, so too did service delivery in such a way that the presence of professors and students in healthcare centers created a dynamic and vibrant atmosphere and ensured that the knowledge of healthcare staff was always up-to-date*" (Participant 11). Another participant stated, "*When our country faced a shortage of medical, nursing, and paramedical professionals, the educational system made every effort to meet the healthcare sector's needs by increasing the admission and training of students*" (Participant 21).

***Proximity and Communication between Faculty Members and Health Managers:*** One participant suggested, "*The university president and some vice-presidents are faculty members of the same university. In various meetings, a group of academic and healthcare service delivery managers come together to make decisions. The decisions they make will benefit both departments the most and minimize challenges and conflicts*" (Participant 1). Another participant also noted, "*Integration provided the opportunity and possibility for collective thinking between the education system and the service delivery system, and for joint decision-making toward a common goal, i.e., the community health*" (Participant 13).

*Development of Applied Research:* One of the findings obtained from data analysis was the development of applied research, comprising three categories: "Easier access to health system information, establishment of an interactive environment between researchers and executive managers, and increased selection of health system applied topics."

***Easier Access to Health System Information:*** Participants believed, "*The most important achievement in this area was the easy access of researchers and students to the vast data of the country's health system*" (Participant 11). "*At present, with a simple intersectoral coordination, researchers can access information from various hospital, university, and health-related databases of their own university and even at the national level*" (Participant 1). A different participant mentioned, "*Researchers themselves are part of this system, which in turn facilitates their awareness of information details and*

*sources and, most importantly, coordination to access it*" (Participant 21).

***Establishment of an Interactive Environment between Researchers and Executive Managers:*** One participant believed, "*Integration led executive managers in universities to recommend their problems to their colleagues in research centers for further study*" (Participant 8). Another participant noted, "*A research committee was formed in various vice-chancellors' offices at the universities, with members including the vice-chancellor for research and the director of the relevant research center, resulting in good interaction between them*" (Participant 11).

***Increased Selection of Health System Applied Topics:*** One participant stated, "*The connection between these two sections has led to a better understanding and recognition of societal needs. As a result of this collaboration, research has become more aligned with the societal needs*" (Participant 8). Another participant remarked,

Medical research has shifted from purely theoretical and impractical investigations toward health issues and problems. Researchers in each region, in collaboration with the service delivery system, have conducted numerous applied and field-based studies. A prime example of this can be observed in the coronavirus disease 2019 (COVID-19) pandemic, the Health System Transformation Plan, education, etc. (Participant 21).

**Weaknesses**

*Weakened Interdisciplinary Convergence:* Most participants emphasized the convergence between different disciplines to strengthen concepts such as socialization and social accountability of medical sciences. Metaphors, such as the unity of disciplines, rethinking the medical sciences-social sciences relationship, artificial intelligence, and the entry of basic mathematical sciences into medical sciences, indicate the importance of interdisciplinary convergence. Weakened interdisciplinary convergence was one of the obtained themes, encompassing three categories: "Weakened interdisciplinary convergence within the Ministry of Health, weakened interdisciplinary convergence between ministries (Ministry of Health and Ministry of Science), and weak university-industry relationship."

***Weakened Interdisciplinary Convergence within the Ministry of Health:*** Participants stated, "*Research in medical sciences is still conducted within educational groups. Although there have been significant efforts in recent years to foster interdisciplinary convergence within the Ministry of Health, there is still a long way before it can be fully implemented*" (Participant 16). Many participants believed, "*There remains a substantial barrier between clinical and basic science departments within the Ministry of Health. This can be seen in clinical rounds, journal clubs, and research activities*" (Participant 1).

***Weakened Interdisciplinary Convergence between Ministries (Ministry of Health and Ministry of Science):*** One participant remarked,

There is currently limited interaction between the Ministry of Science and the Ministry of Health, despite the fact that many of the sciences within the Ministry of Health require serious interaction with departments in the Ministry of Science, such as disciplines related to the Faculty of New Technologies, disciplines related to the Faculty of Rehabilitation, and various disciplines of health, basic medical sciences, etc. (Participant 8).

Another participant stated, "Now that artificial intelligence has emerged and serious discussions about its use in medical sciences are taking place every day, the Ministry of Health should establish constructive communication and interaction with the Ministry of Science's disciplines, such as computer engineering and its related fields'" (Participant 21).

***Weak University-Industry Relationship:*** Participants believed, "*The problem of weak industry-university relationship began when industry introduced technology without considering the country's existing knowledge, viewing itself as independent of universities, and on the other hand, universities received their funding from the government and turned their backs on industry*" (Participant 11). "*Unfortunately, the industry-university relationship in our country is weak and unstable, and there are very few domestically produced products that can be attributed to research and development processes*" (Participant 1).

*Deviation from the Educational and Research Mission:* One of the findings obtained from the data analysis was deviation from the educational and research mission, consisting of four categories: "Expansion of university responsibilities, involvement of university management teams in executive affairs and service delivery, excessive involvement of faculty members in service delivery, and underdevelopment of interdisciplinary research."

***Expansion of University Responsibilities:*** Participants expressed, "*When a university's*

*responsibilities extend beyond education and research to include service delivery, it not only doubles but multiplies the university's responsibilities*" (Participant 16). Many participants believed, "*The areas of treatment, health, food, and drugs, as service sectors of the Ministry of Health, are so diverse and extensive that, alongside research and education, they have made the responsibilities of universities of medical sciences as heavy and cumbersome as several ministries*" (Participant 1).

***Involvement of University Management Teams in Executive Affairs and Service Delivery:*** Participants believed, "*Due to its nature, the healthcare field has so many executive challenges that it consumes the entire university president's time and focus*" (Participant 11). "*Since the treatment and its resultant problems, such as drug or medical equipment shortages or bed shortages, etc., are so visible, it inadvertently leads to a deviation from its educational and research mission*" (Participant 1).

***Excessive Involvement of Faculty Members in Service Delivery:*** Participants suggested, "*Although the integration law provided a golden opportunity to utilize skilled physicians as faculty members, we have witnessed their involvement in therapeutic processes, which could be a double-edged sword. If a university cannot manage this, it may cause harm*" (Participant 16).

***Underdevelopment of Interdisciplinary Research:*** Participants believed, "*The nature of the interdisciplinary convergence and the necessity of interdisciplinary collaborations are more evident in research than in education*" (Participant 14). Another participant noted, "*Interdisciplinary research is currently underrepresented*" (Participant 21). One of the participants stated, "*With the advent of new technologies and advanced equipment, there is a pressing need for serious scientific research in the fields of basic mathematics, humanities, and experimental sciences*" (Participant 1).

*Conflict of Interest:* This theme was one of the findings extracted from the data analysis, involving three categories: "Conflict of interest in the accreditation of educational and therapeutic institutions and centers, conflict of interest in the balanced development of medical education, and managerial conflict of interest (law-making)."

***Conflict of Interest in the Accreditation of Educational and Therapeutic Institutions and Centers:*** Participants stated, "*Until the Ministry of Health itself both develops and conducts accreditation with its own scientific and executive team, we cannot expect to witness an improvement in its quality*" (Participant 16). "*When the institution providing a service is also the same one accrediting or evaluating that service, due to the direct correlation between the accreditation results and the hospital's revenue, neutrality is difficult to achieve. This can significantly compromise improvements in the quality of education and service delivery*" (Participant 11).

***Conflict of Interest in the Balanced Development of Medical Education:*** Participants stated, "*When the Ministry of Health itself both trains personnel and determines the need for each specialty in the country to provide services, the policies determining the number of admissions in each may be influenced by the power of the disciplines' scientific and specialized boards*" (Participant 11). A different participant mentioned, "*In some disciplines, we have seen resistance from the Ministry of Health to increase capacity*" (Participant 21).

***Managerial Conflict of Interest (law-making):*** Participants suggested, "*The implementation and regulatory domains should be separated to minimize the creation of monopolies*" (Participant 6). "*For instance, the determination of tariffs by the Ministry of Health results in conflict of interest, which should be separated and conducted by an impartial lawmaker*" (Participant 9). "*The licensing of new physicians is solely in the hands of current healthcare providers, which can create conflict of interest in the licensing process*" (Participant 22).

## Opportunities

*Support of Laws and Regulations for Integration:* This theme included three categories: "Approval of the integration plan by the Supreme Council of the Cultural Revolution, approval of the integration plan by the Islamic Consultative Assembly, and approval of the integration plan by the country's scientific documents."

***Approval of the Integration Plan by the Supreme Council of the Cultural Revolution:*** Participants stated, "*The Cultural Revolution Headquarters was responsible for reviewing university programs and, after several years of investigations, proposed the plan of medical education separation from the Ministry of Science and the establishment of the Ministry of Health, Treatment, and Medical Education*" (Participant 8).

***Approval of the Integration Plan by the Islamic Consultative Assembly:*** Participants mentioned, "*One of the main backings of the medical education integration law is its approval by the Islamic Consultative Assembly in 1985*" (Participant 6). "*Given the immense problems in the health sector and after much debate, it was approved by the*

*Islamic Consultative Assembly to ensure enforceability*" (Participant 9).

***Approval of the Integration Plan by the Country's Scientific Documents:*** Participants stated, "One of the backings of this law is emphasis on it in high-level documents, such as the health policies announced by the Supreme Leader, which have been emphasized that medical education should be implemented under the supervision of the Ministry of Health and within the health system" (Participant 11).

*Expansion of International Interactions:* One of the findings obtained from data analysis was the expansion of international interactions, encompassing three categories: "Expansion of health tourism, development of foreign student recruitment, and development of international research."

***Expansion of Health Tourism:*** Participants acknowledged, "*The government's approach to developing international relations can open up new horizons for the Ministry of Health, Treatment, and Medical Education, while simultaneously strengthening both the educational and service delivery structures*" (Participant 1). "*Attracting foreign patients requires up-to-date facilities, advanced technologies, and skilled and knowledgeable physicians. The educational nature of the health system provides more opportunities for growth and staying updated, as education is inherently dynamic*" (Participant 12).

***Development of Foreign Student Recruitment:*** Most participants emphasized the opportunity created for international student recruitment to develop and strengthen the integration plan. One of the participants stated, "*It is not possible to recruit foreign students with the country's limited clinical capacities, as foreign students expect adequate clinical facilities, and the overcrowded clinical spaces may lead to dissatisfaction. Therefore, the integration capacity should be utilized to develop clinical spaces*" (Participant 18).

***Development of International Research:*** A participant stated, "*International research activities are easier than other activities because they require fewer infrastructures*" (Participant 6). Another participant mentioned, "*Success in international research areas largely depends on the presence of competent and interested professors. Success and excellence in this field can contribute to the success of both service delivery and education*" (Participant 2).

## Threats

*Incomplete Understanding of Integration:* This theme included three categories: "Neglect of functional integration, lack of budgeting aligned with integration goals, and misalignment of laws and regulations with integration goals."

***Neglect of Functional Integration:*** Some participants noted, "*It is worth considering whether the integration achieved the goals and expectations that were set for it*" (Participant 2). "*Although the integration was carried out within a structure and we now have a centralized Ministry of Health, Treatment, and Medical Education, the question is whether integration occurred in the functions of these sectors?*" (Participant 3). "Functional integration in the areas of service delivery and education has not occurred to the extent that the integration plan had predicted..." (Participant 20).

***Lack of Budgeting Aligned with Integration Goals:*** Participants suggestd, "*When we say integration, we should not only mean a formal integration, but our behavior, our policies, and the budget we approve should be based on an integration perspective*" (Participant 17). "*Now, in the budget, we have two separate chapters for the education sector budget and the health sector budget, and this means separation, not integration...*" (Participant 3).

***Misalignment of Laws and Regulations with Integration Goals:*** One participant stated, "*The current understanding of integration is not comprehensive... We have formally achieved integration, but our laws are not aligned with integration*" (Participant 4). Another participant mentioned, "*The rules for promotion and advancement of faculty members are similar to the Ministry of Science... The spirit of integration is not observed in promotion and advancement*" (Participant 2).

*Emergence of New Educational Approaches:* This theme included two categories: "Development of artificial intelligence and development of virtual learning."

***Development of Artificial Intelligence:*** In the majority of participants' discussions, the changing global technology was considered a threat to the future of integration. They stated, "*When artificial intelligence can improve the quality of clinical education, the philosophy of integration, which was to use clinical fields for treatment, might become meaningless*" (Participant 11). "*Artificial intelligence once again raises the concept of the unity of sciences and requires an interaction between sciences, particularly basic mathematics, humanities, and experimental sciences*" (Participant 2).

***Development of Virtual Learning:*** A participant stated, "After COVID-19, teaching methods changed... While the COVID-19 pandemic cautiously brought education into the virtual realm within the clinical setting, a portion of courses were inevitably conducted virtually" (Participant 12). Another participant stated, "We could also use methods like augmented reality or other virtual tools, such as simulators, telemedicine, etc." (Participant 21).

*Political and Social Pressures:* This theme included three categories: "Excessive increase in student capacity despite the lack of infrastructure, excessive increase in independent medical schools, and university's involvement in challenges beyond its scope of responsibility."

***Excessive Increase in Student Capacity despite the Lack of Infrastructure:*** Participants stated, "*The infrastructure was supposed to be developed during the integration process to provide the necessary conditions for increasing the number of students. Although the increase has exceeded compared to what was initially planned, the infrastructure is still below standard*" (Participant 2). "*Due to Parliament's pressure and environmental factors, the number of students has now increased, but the infrastructure is not really ready and may lead to reduced quality of education, and people may also be dissatisfied with hospital services. This means a loss for both sides...*" (Participant 19).

***Excessive Increase in Independent Medical Schools:*** Participants identified the excessive increase in independent universities of medical sciences/ medical schools as a threat, stating, "*Many of the universities of medical sciences and independent medical schools that have been established are under the influence of political and social pressures. There is no expert-based need for this much expansion*" (Participant 18). "*The philosophy of integration assigned the responsibility of health, treatment, and medical education in each province to one university of medical sciences, but now we see that in some provinces, there are two or even three independent medical schools and universities of medical sciences*" (Participant 1).

***University's Involvement in Challenges beyond its Scope of Responsibility:*** Participants mentioned, "*Integration has forced university presidents and even deans to confront non-academic, more executive challenges*" (Participant 14). "*When the COVID-19 pandemic emerged, university presidents and even the Ministry of Health were more focused on treatment and vaccines than on education; of course, this approach is natural... I mean they did not benefit from the integration, and education injured here.*" (Participant 3).

## Discussion

Based on the findings of the current study, the strengths of the integration plan, as perceived by the study population, include "self-sufficiency in health human resources, expansion of educational fields, enhancement of social accountability, growth of educational and health indicators, improvement of the connection between education and services, and development of applied research." Ebrahimnia et al. identified "downsizing the administrative structure and increasing efficiency" as additional strengths of the integration plan (21). Numerous studies have emphasized self-sufficiency in training specialized human resources in the health sector as one of the most critical strengths of the integration plan (9, 10, 22, 23), which is consistent with the findings of the present research. Majdzadeh et al. attributed this to the increased capacity of universities of medical sciences in the country (22). However, some studies have cited an increase in the number of admissions in all medical fields, an improved physician-to-population ratio, complementary training and subspecialty programs (15), the utilization of faculty members specialized in treatment and education, and consequently, a more equitable distribution of human resources (12), and increased efficiency in the number of human resources (21) as reasons for such self-sufficiency.

One of the global challenges in medical education is the inability to social accountability (24), while the fundamental philosophy of universities of medical sciences is accountability to the community needs and expectations (7). Enhancement of social accountability as an inherent element of universities of medical sciences is considered one of the strengths of the integration plan. Research results have demonstrated that the integration plan is an effective approach to addressing the real and important needs of society (9, 25-27) because by bringing together the education system and the service delivery system, an appropriate platform is provided for accountability, and the education system facilitates this accountability (28). Improvement of service indicators have also been identified as a strength and positive impact of integration in other studies (23, 29). According to Shakibaee et al.'s research, the highest level of success in this plan was achieved in the health services and indicators sector, including increased coverage of health

services, vaccination coverage rates, ease of access to healthcare facilities and hospitals, and improved mortality rates (10). This important outcome has been achieved through an increase in skilled human resources and medical equipment across the country, particularly in underserved areas.

Growth in educational indicators, improvement of connection between education and services, and expansion of educational fields were among the other strengths of the integration plan reported in the current study. In Rahnavard's research, the learning dimension ranked highest among the dimensions of integration function (30), and this growth and development was also observed in educational indicators (10), as well as increased number of admissions in all medical science disciplines and postgraduate and subspecialty training programs in other studies (15). Some studies have regarded the significant increase in domestic researchers' publications in recent years to be linked with the implementation of the integration plan (4, 22, 31, 32). This can be due to the creation of a link between research and service, the development of applied research considering the necessity of providing services based on evidence and findings obtained in the medical field, as well as the interaction between researchers and decision-makers.

According to the present study results, weakened interdisciplinary convergence, deviation from the educational and research mission, and conflict of interest were among the weaknesses of the integration plan. Ebrahimnia et al., in their study, identified the inability to be effective and the interference between the headquarters and the front line as weaknesses of the integration plan (21). Other studies have also alluded to the lack of convergence and the creation of interdisciplinary discourse within universities of medical sciences and the Ministry of Science (4). The weakening of the education sector and the decline in the quality of education have been identified as weaknesses of the integration plan in several studies (4, 21, 23, 29). Factors such as the increased number of universities, the increased medical student admission capacity, the decreased medical education budget, the autonomy of educational hospitals, and the deficiencies in the professor and student selection law have been cited as reasons for this decline. Deviation from the research mission is a point identified as a weakness in Majdzadeh et al.'s study, and the focus on service delivery has been the reason for such a deviation and neglect of knowledge production (22). Their research also highlighted weakened interdisciplinary convergence and the link between research and practice, being categorized as one of the hindrances arising from managerial weaknesses. They argued that even when this link is established, it is often ad-hoc rather than systematic. Furthermore, the management of processes does not define the relationship between academics and the executive sector (22). Rahnavard's research emphasizes the importance of conflict and the management of dispute in successful integration (30), which aligns with the findings of the present study. Fostering interdisciplinary relationships within the Ministry of Health through culture-building and mindset change is one of the solutions.

As shown by the results of the current research, the opportunities of the integration plan include support of laws and regulations for integration, a positive outlook on the integration of education and service delivery, and expansion of international interactions. With the approval of the integration plan by the Supreme Council of the Cultural Revolution and the Islamic Consultative Assembly, as well as the appointment of representatives from the Ministry of Health by the Cultural Revolution Council, legal support for this plan has been secured. On the other hand, this plan has not been given special attention in five-year plans, and faculty members' promotion regulations and the budgeting model are not aligned with this plan (32).

Additionally, the findings of this research demonstrated that incomplete understanding of integration, emergence of new educational approaches, and political and social pressures were considered threats to the integration plan. Incomplete understanding of integration has been identified as a barrier to successful implementation of integration in various studies (13, 32). However, the concept analysis of integration can clarify its dimensions, characteristics, applications, influencing factors, consequences, and practical applications (33). Faculty members' focus on clinical responsibilities and less time spent on education and research, reduced quality of education, redused illness spectrum in educational centers, weakened medical ethics due to professors' materialism of and students' imitation of them, and limited educational space were mentioned as negative aspects and threats of medical education integration (32).

## Conclusion

The analysis of participants' experiences yielded 14 main themes and 42 subthemes in the form of SWOT. The integration of medical education and the health system is a complex process, and there is a consensus regarding the success of this plan in providing skilled human resources, improving social accountability, enhancing service indicators, and expanding medical education fields in the country. It seems necessary to select appropriate strategies to maximize the strengths and opportunities of the plan while minimizing weaknesses and threats, and to develop potential solutions. It is recommended to conduct foresight studies, design various scenarios, and formulate complementary and alternative models, structures, and processes, as well as conduct economic evaluation research.

**Supplementary Material(s):** is available here [To read supplementary materials, please refer to the journal website and open PDF/HTML].

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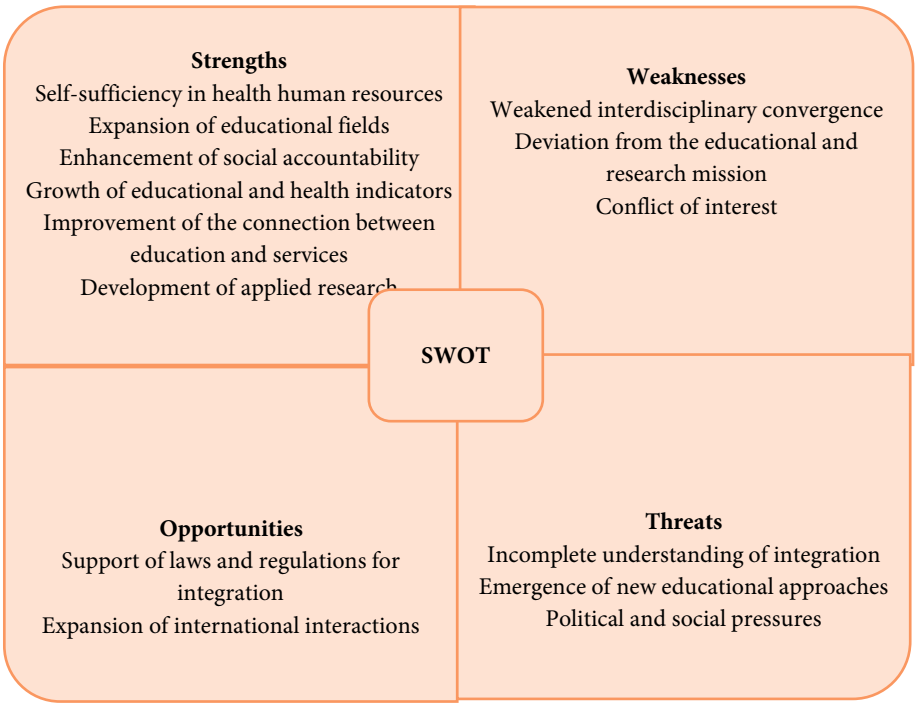


**Figure 1:** Main themes identified in the integration of medical education and service delivery using a Strength, Weakness, Opportunities, Threats (SWOT) approach

**Table 2**. Extraction of main themes and subthemes of the integration of medical education and service delivery using a Strengths, Weaknesses, Opportunities, Threats (SWOT) approach

| SWOT Components | Main Themes | Subthemes |
|---|---|---|
| Strengths | Self-sufficiency in health human resources | Increased capacity for human resources training |
| | | Independence from foreign manpower |
| | | Provision of the necessary workforce for deprived areas |
| | Expansion of educational fields | Establishment of educational fields in the country's healthcare networks |
| | | Increased number of educational hospitals and beds |
| | | Possibility of using more paraclinical spaces |
| | Enhancement of social accountability | Breaking down the barriers of medical schools |
| | | Accountability to societal expectations in the health sector |
| | | Possibility of student presence at all levels of service delivery |
| | Growth of educational and health indicators | Increased number of medical science education programs |
| | | Increased number of educational and therapeutic institutions and centers |
| | | Development of primary healthcare services |
| | Improvement of the connection between education and services | Using healthcare service facilities for educational purposes |
| | | Using the capacity of faculties to meet the health workforce needs |
| | | Proximity and communication between faculty members and health managers |
| | Development of applied research | Easier access to health system information |
| | | Establishment of an interactive environment between researchers and executive managers |
| | | Increased selection of health system applied topics |
| Weaknesses | Weakened interdisciplinary convergence | Weakened interdisciplinary convergence within the Ministry of Health |
| | | Weakened interdisciplinary convergence between ministries (Ministry of Health and Ministry of Science) |
| | | Weak university-industry relationship |
| | Deviation from the educational and research mission | Expansion of university responsibilities |
| | | Involvement of university management teams in executive affairs and service delivery |
| | | Excessive involvement of faculty members in service delivery |
| | | Underdevelopment of interdisciplinary research |
| | Conflict of interest | Conflict of interest in the accreditation of educational and therapeutic institutions and centers |
| | | Conflict of interest in the balanced development of medical education |
| | | Managerial conflict of interest (law-making) |
| Opportunities | Support of laws and regulations for integration | Approval of the integration plan by the Supreme Council of the Cultural Revolution |
| | | Approval of the integration plan by the Islamic Consultative Assembly |
| | | Approval of the integration plan by the country's scientific documents |
| | Expansion of international interactions | Expansion of health tourism |
| | | Development of foreign student recruitment |
| | | Development of international research |
| Threats | Incomplete understanding of integration | Neglect of functional integration |
| | | Lack of budgeting aligned with integration goals |
| | | Misalignment of laws and regulations with integration goals |
| | Emergence of new educational approaches | Development of artificial intelligence |
| | | Development of virtual learning |
| | Political and social pressures | Excessive increase in student capacity despite the lack of infrastructure |
| | | Excessive increase in independent medical schools |
| | | University's involvement in challenges beyond its scope of responsibility |

SWOT: Strengths, Weaknesses, Opportunities, Threats