

## Original Article

**Effective Factors in the Establishment and Implementation of Patient Electronic Referral System in the Healthcare System: A Qualitative Study**Fatemeh Tajari<sup>1</sup> Ghahraman Mahmoudi<sup>2\*</sup> Fatemeh Dabbaghi<sup>3</sup> Jamshid Yazdani-Charati<sup>4</sup>

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**Abstract**

**Background and Purpose:** The electronic referral system was established in Iran with the aim of increasing access to care, improving interaction, and efficient use of resources. The purpose of this study was to determine the effective factors in the establishment and implementation of electronic referral system in Iran.

**Materials and Methods:** The present study was qualitative with a content analysis approach. In order to collect information, in-depth and semi-structured interviews were used. After interviewing 42 people, the information was saturated. The interviews were transcribed and analyzed, and the main topics were quoted, cited and coded. Content analysis method was used and all authors participated in the analysis process to avoid bias and agreement.

**Results:** Four main themes and eleven sub-themes were mentioned as effective themes in the implementation of the electronic referral system by the interviewees including resource management (human resource management, financing and equipment and infrastructure), stewardship (policy-making, inter-sectorial leadership and intra-sectorial governance), advocacy stakeholders (senior officials and policy-makers related to the program, service providers, community), and social commitment (commitment and accountability of service providers).

**Conclusions:** Successful implementation of electronic referral systems requires the development of an operational plan that correctly identifies the factors affecting the establishment and implementation, as well as the cooperation of all responsible organizations which can help improve the establishment and sustainability of the program. It is suggested that managers and officials active in the field of health services use the results of this study in the establishment and implementation of electronic referral system.

**Keywords:** Referral and Consultation, Tertiary Care Centers, Hospitals, Hospital Information Systems

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## 1. Introduction

The success of primary health care programs, in the form of a healthcare network system with a comprehensive and universal health coverage (UHC) approach, has led to the application of the four basic principles of the country's healthcare network system, namely social justice, cross-sectoral cooperation, public participation, and the use of appropriate technology, which were referred to at all stages of the system implementation (1).

Mousavi et al. in their study stated that it is very important for governments to design strategies and policies that can facilitate the adoption of e-health and guide the use of information and communication technology to achieve the desired goals (2). Also, Naseri asl et al. provided strategies for success in various fields of electronic referral. The results of their study showed that the implementation of electronic referrals requires political support and more attention to socio-technical conditions (3). The findings of Kamwa et al.'s study showed that infrastructure, health information systems, the capacity of healthcare staff and financial resources, training, etc. are challenges in implementing the healthcare referral system in Kiambo (4). The results of the study of Acquah-Swanzy also showed that adequate preparation of the hospital before the introduction of electronic systems through the use of experiences of other systems implemented in other hospitals, the establishment of an IT department, the establishment of infrastructure and network communications, and staff training all are necessary (5). In general, the use of information and communication technology in public health and the achievement of the Millennium Development Goals have been recognized

in various countries (5). To solve the problems of paper references, as in other sectors, interest in the use of information technology and communication in healthcare systems has increased and electronic referral is recognized as one of the best alternative solutions (6). The electronic referral system can be used as a new model for integrating primary and secondary healthcare (7) with aims to increase access to care, improve interaction and efficient use of specialized resources, etc. The Alberta Health Council enumerates the purpose of implementing e-referrals by naming 1. Improving the efficiency of health services, 2. Improving access and reducing waiting time, 3. Increasing stakeholder acceptance, 4. Appropriate care with standard referral management process and increasing acceptance, 5. Monitoring performance indicators, and 6. Improving patient safety (8). Several countries, such as the United Kingdom, Finland, Norway, the Netherlands, Denmark, New Zealand, Australia, and the United States, have received electronic referral systems with varying degrees of success (9, 10), but there are many factors that prevent success (11). The aim of the present study was to determine the effective factors in the establishment and implementation of electronic referral system in Iran. Identifying effective themes will help officials in the field of health services to better understand and subsequently make appropriate micro- and macro-decisions to provide better services and provide favorable conditions for the treatment of patients.

## 2. Materials and Methods

The present study was a qualitative study with a content analysis approach which was conducted in Iran in 2021. The research community included manager, policy makers and executive vice presidents of the Ministry of Health and medical universities, service recipients and providers, and university faculty members. The inclusion criteria was knowledge in the field of electronic referral with a minimum of 3 years of work experience. Exclusion criteria included people who did not have enough information about the subject or did not want to participate in the research.

Target-based snowball method was used to collect the sample. To compile a guide, the interviewer first gained the theoretical model of the guideline by reviewing previous studies and, in addition, the experiences of several experts were also

used. In order to collect the data after completing the consent form by the interviewee, semi-structured interview method and in-depth interviews were conducted individually. Coordination for the interviews was performed in person and by presenting a letter of introduction. While explaining the purpose of the interview, they were assured that the information obtained from their interviews would be kept completely confidential and, at the same time, they signed informed consent that despite the initial agreement, questioning can stop at any time during the interview.

They signed informed consent that despite the initial agreement, questioning can stop at any time during the interview. The interviews continued with 42 persons, i.e. the study data were saturated (Table 1).

**Table 1. Characteristics of the Participants**

	Variables	Percentage	Interview
<b>Degree</b>	Bachelor's/ Master's	26.3	10
	General Practitioner	28.9	11
	PhD and post-doctoral	34.2	13
	Specialist and subspecialist	10.5	4
<b>Organizational position</b>	Patient	10.5	4
	Technician	23.6	9
	General Practitioner / Specialist	13.1	5
	Executive manager or head	23.6	9
	University faculty member	13.15	5
	Manager/ Ministerial position/ University position	15.7	6
<b>Gender</b>	Men	73.6	28
	Women	23.6	10

The time of each interview was 60 to 120 minutes, the meetings were recorded by a simultaneous tape recorder, and they signed informed consent that despite the initial agreement, questioning can stop at any time during the interview. They were implemented to know the time of data saturation and to increase the accuracy and precision of text implementation. Finally, to confirm the validity of the interviews, after the implementation of each interview, the typed recordings were examined and approved by the interviewer and reviewed. The process of data analysis, called framework analysis, consisted of five steps: familiarity, identification of thematic framework, indexing, drawing and drawing maps and interpretations. The main topics identified, named, and coded, and all authors participated in the analysis process to avoid bias and disagreement. To increase the reliability of the research, the research

team reviewed the codes and themes twice through an expert panel to agree on any interpretation. The interviews and analysis methods were approved by two experts in the field of qualitative research.

Name of the ethics committee and approval number in the Ethics Approval field: Office of Research and Technology Development of Medical Sciences - Islamic Azad University. Islamic Azad University of Chalous. IR.IAU.CHALUS.REC.1397.025

**3. Results**

In this study, the results were reviewed and categorized using qualitative methods and content analysis. Finally, the findings of the study were classified into 4 main themes: resource management, stewardship, stakeholder engagement and social commitment, and 11 sub-areas that should be considered in the implementation of the electronic referral system (Table 2).

**Table 2. The main themes and subthemes of Establishment and Implementation of Patient Electronic Referral System**

NO	Themes	Subthemes
1	Resource management	Human Resource Management Financial Resource Management Management of physical and equipment resources Information and Communication Technology Management
2	Stewardship	Policy-making Inter-sectorial leadership Intra-sectorial governance Access to information
3	Advocacy stakeholder	Advocacy of senior officials and policy makers of organizations Advocacy service providers Advocacy of community participation
4	Social commitment	Commitment and accountability of service providers

**1. 2. Resource Management**

The problem of resource constraints and management in the health systems has always been a concern. In this study, many interviewees mentioned resource management in various dimensions, such as

human, financial, physical resources and equipment resources and information technology management, etc.) as one of the important requirements in the establishment and implementation of electronic referral system. According to the

interviewees, in the field of resource management, equipment management and technology platforms were the most important strategies in the implementation of the electronic referral system, along with financing strategy as support strategies in the implementation stage, and human resource management as the most important strategy in the implementation process.

In the interviews, human resource management (in terms of number and volume of work, etc.) and education, culture and empowerment in order to create a positive attitude of human capital, especially in-service providers as one of the effective factors in the successful implementation of the electronic referral system were expressed.

(Person 23) stated, "Many of these referrals to specialists were not necessary and the general practitioner could perform the treatment. With the electronic referral system, many unnecessary tasks can be prevented, thus managing the workload of the manpower and ultimately leading to an increase in quality of care."

(Person 35) also said, "In the paper system, reverse referrals were very high, which put a lot of cost and burden on the patient and additional work to the service provider and reduced the motivation and psychological burden on the doctor, but in the electronic referral system this problem is solved."

Financial resource management was one of the important requirements mentioned by the interviewees in the establishment and implementation of the electronic referral system in this study. Many participants in the study mentioned allocation of sufficient funds to provide equipment and technology platforms, payment system of service

providers, reduction of out-of-pocket payments, etc.

"One of our goals in the electronic referral system is to organize services and reduce the costs of the health system. For example, if a general practitioner can provide a service, it is less expensive than a specialist, and this leads to the management of financial resources" (Person 35)

(Person 32) also mentioned that "Let's put the auto stops in the system and check whether it is part of the insurance or not? If not, another medicine is prescribed. This is part of the program, which if implemented properly, is very useful. On the other hand, if the person has had an MRI or ultrasound once, the system will not allow the person to be re-prescribed. In fact, auto-stops help reduce costs."

Referring to the reduced demand for induction in electronic referrals, (Person 33) said "In paper referrals, due to insufficient time, I had to respond positively to some of the patient's irrational requests because it took a long time to argue with the patient. This increased their inductive needs and the facilities were not used for other patients. However, in electronic referral, this issue is controlled."

According to the interviewees, equipment management and the creation of technology platforms are the most important strategies in the implementation phase of the electronic referral system. If the referral system is to be fully implemented, all its facilities must be provided in order to provide complete and correct services.

"The most important threat is that we have not provided a proper infrastructure and we are trying to implement an electronic referral system in the country, hence these problems in the infrastructure will cause

dissatisfaction among service providers and recipients," (Person 30).

As with any ICT system, numerous challenges have been identified with the implementation of electronic health registration systems. IT-related topics include information security, information exchange speed, information integrity, and access to the information provided by participants.

Regarding the integration of information, (Person 17) said, "One of the achievements of electronic processing is that we gather health information together and create a secure platform for information sharing, and this helps to ensure that at least the service provider is aware of the background. One can make a treatment plan".

Furthermore, regarding access to information (Person P 5) said, "One of the strengths of the electronic referral system is the transparency of statistics and the ability to access all statistics and its outputs, including referral rate, referral feedback rate and reverse referral rate, etc. At every level, there are hospitals, centers, health houses, etc."

"There was a point in our country, before it became electronic, that a lot of our information could not be measured and there was a need to design a system that could help with the electronic process of referral. Electronic referral has great opportunities: the best and most accurate recording system can be extracted, or, you have an accurate recording system that you can increase its productivity day by day (Person 27).

(Person 18) said: "Information security is another issue that must be considered in electronic health systems. The lack of security in the electronic health record

system leads to the disclosure of large amounts of personal information and causes patients' dissatisfaction and reduces their trust in the health system and electronic referral services. This program also increases the speed of information exchange.

"Suppose a patient used to go to the center and needed a referral; he/she would be referred to a specialist immediately with this system, and with the online appointment system, so a lot of time will be saved," (Person 12).

## 2. 2. Stewardship

Stewardship has been introduced as the most important function of the health system. It means explaining and strengthening the executive rules and presenting orientations and strategies for all actors and accepting macro responsibility and accountability at the highest level(12) Stewardship are very important in the electronic referral system, which was mentioned by some of the interviewees. In this regard, the sub-themes (policy-making, cross-sectorial leadership and intra-sectorial governance) are examined. "The structure of service delivery should be considered a principle and priority by the senior government official, and policies should come down from the government, and it is the local High Health Council that should approve these policies. All departments and organizations are obliged to implement them" (Person, 26). Stewardship are defined in the following three sub-domains:

The development of laws and regulations, the existence of a comprehensive strategic plan for the health sector, and the existence of inter-sectorial councils and policy committees were some of the issues raised by many interviewees. One expert in the



field said "Determining the vision of coordinated policies to achieve the vision of the electronic referral system, the ability to adapt strategies and policies to change needs and priorities when planning the electronic referral system is very important," (Person 40).

The existence of strategic inter-sectorial policy councils and support programs for the electronic referral system and the determination of the roles and responsibilities of each of the implementers of the project were mentioned by the interviewees. Participant No. 27 said about this, "We need to see if the roles and responsibilities of the public, private and voluntary sectors have been determined. And have support programs been developed by the Ministry of Health for institutions affecting the electronic referral system?"(Person 27)

Values and ethical principles between all implementing departments and integration in accreditation and supervision by the Ministry of Health are among the factors that advocators should pay attention to.

### **3. 2. Advocacy of stakeholders**

In Health care systems, many stakeholders interact with different knowledge, beliefs, interests, and cultures that influence each other. One of the key implementation requirements raised by interviewees is the advocacy of stakeholders, which in the present study includes organizations related to the program, providers, and community. Education and culture building in these groups can definitely contribute to the success of the program.

Study participants stated that the advocacy of influential people at national and provincial levels in successful implementation is very important.

Organizations related to the program can include public and private organizations, trade unions and computer associations in the country.

An expert in this field said about this "In order for the officials and high officials to have a consensus on this plan and to support it, in terms of the political structure of the program, it must be communicated from the highest high official of the country so that all organizations and institutions have the necessary participation in implementing this program" ( Person 8).

Participant No. 38 also stated: "The referral system must be pervasive; media propaganda must be carried out and it must be institutionalized in the culture of the people. We need a very strong demand for national media,"

Service providers, as the executive arms of the electronic referral system, are very helpful in the implementation phase. Their advocacy should be prioritized.

"The most important thing in the advocacy of service providers' and the reduction of their resilience is the safe payment of service providers. We have always had this guard (especially at level 2), say that, it is recommended to design the payment system with the participation of service providers" (Person 7).

"The policies of developing countries help us communicate and induce from top to bottom, and we tell people you have to implement. That is, there is focus on the top but the bottom is abandoned. Instead of informing the people, they involve the people in their decisions. And one of the important things is that, we should involve the people and service providers in health planning and policy-making" (person 20).

"People seek to get all health services as close as possible for a variety of cultural

and social reasons. I think these opportunities that e-referral has in these few dimensions of cost, effectiveness, efficiency, satisfaction that occurs after the transition period, and informing stakeholders can be the best opportunity in the advocacy of stakeholder participation and successful implementation of the program" (person 12).

#### **4. 2. Social Commitment**

Social commitment and accountability was one of the issues that the interviewees considered necessary in the successful implementation of the electronic referral system. One of the managers participating in the study stated that "accountability is like a driving force that encourages key actors to be responsible for the performance and service entrusted to it" (person 14). This domain includes a subdomain:

"Managers and policymakers believe in the interests of society, the commitment of service providers to provide quality services and meet the needs of patients and the observance of the Charter of Patients' rights and proper response to service recipients are factors that should be considered in the implementation of electronic referral system. These factors are referred to as general social commitment" (person 38).

#### **4. Discussion**

This study aimed at determining effective factors in the establishment and implementation of patient electronic referral system in the healthcare system. In this study, the results were reviewed and categorized using qualitative methods and content analysis. Finally, the findings of the study were classified into 4 main themes: resource management, stewardship, stakeholder engagement and social

commitment and 11 sub-areas that should be considered in the implementation of the electronic referral system. Many interviewees mentioned resource management in various dimensions (human resources, financial resources, physical and equipment resources, and information technology management, etc.). The results of a study by Naghipour et al. Showed that the existing problems in the country's IT infrastructure, attitudes and behavioral limitations of individuals, financial constraints, rapid changes of managers, lack of skilled manpower are the main obstacles in the development of e-health in Iran, the results which confirm the findings of the current study (19).

In the interviews, the health system managers believed that knowledge development and empowerment with the aim of creating positive human capital was the main factor in the success behind the electronic referral system. Resistance to change, especially in terms of workflow change, lack of knowledge and skills required for working with electronic systems, and specialists' concerns about increasing workload were among the most important issues that had to be addressed in human resource management strategies in electronic referral systems.

According to Bouamrane et al., one of the main and vital strategies of the health system is the supply and management of talented human capital as the most important source of knowledge, innovation and creativity. In fact, efficient human capital underlies the success of the electronic referral system (10). Increasing the workload of service providers leads to increased dissatisfaction and disuse of the electronic referral system (5), while with proper planning, the electronic referral system can reduce the workload and stress



of the user and also increase the quality of performance for all service providers (13), the results which were in line with the findings of our study.

The need for intelligence and electronic infrastructure and adequate funding to provide equipment and technology to maintain the systems was mentioned by many participants in the study. Acquah - Swanzy in his study stated that the shortcomings of information and communication technology infrastructures can cause problems in incorporating the services among different parts of the health system, and as a result, reduce the satisfaction of service providers and patients, as well as the efficiency of the electronic referral system (5). Stewardship is very important in the electronic referral system, which was mentioned by some of the interviewees. Stewardship is defined in the following three sub-domains: policy-making, cross-sectorial leadership, and intra-sectorial governance. Tajvar and Mehtarpour enumerated the important challenges of the family physician program as the frequent changes of the Ministry of Health decision-makers in the field of family physician, haste in implementation and careful planning, and exercising parliamentary power and consolidating the role of government as the guardian of the health system and integration. Providing insurance also seems necessary for better management of the referral system (20).

Concerning regulatory legal and policy framework, it is difficult, in most countries to find clear policies and coordination between state or governmental agencies and e-Health initiatives. This is a huge obstacle in implementing e-Health in developing countries. Instability in political issues makes it really difficult to find policy governance for long-term projects (17).

One of the key implementation requirements raised by interviewees was the advocacy of stakeholders. Education and culture building in these groups can definitely contribute to the success of the program.

According to the results of the present study, the three main stakeholders in the implementation of the electronic referral system included healthcare providers, patients and insurance companies. Service providers considered factors, such as easy use of electronic systems, quality of electronic systems, such as security and speed of information exchange, an increase in workload and payment system, as the most important factors that can maximize the participation of providers, patients and the insurance companies in electronic referral programs.

From the patients' point of view, the quality of care and reducing the waiting time, and from the point of view of insurance organizations, improving the quality of care, increasing access to services and reimbursing costs based on the performance of service providers in the electronic referral system were claimed to be the most important factors. Furthermore, focus on their implementation can attract the maximum participation of providers, patients and organizations related to the program to implement the electronic referral system. Studies have shown that in healthcare system, service providers, recipients of services, and stakeholders are all interconnected, whereas they have different knowledge, beliefs, interests, and cultures that influence people. Stakeholder advocacy builds understanding and support among different groups that can improve policy and action plan and enhance the effects of change (14, 15). Keely in her study stated that patients and front-line

providers should be empowered to influence the design, implementation and evaluation strategies of e-Referral services. Without this critical engagement, any new service carries the risk of causing increased fragmentation, restricted access when failed to meet referral requirements, reduced portability across geographical boundaries, inequity based on patients' access to technology and computer literacy, and provider burnout from additional administrative work (20). Schumacher (2010) identified "non-use of human factor design principles" as the main barrier to usability and satisfaction in electronic health records. (16). From the interviewees' point of views, the payment system is very important in electronic referrals. In this regard, it is necessary to design and use e-service delivery models according to the structure of the health system and with the participation and opinions of users. Tuot et al. stated that creating appropriate budget models for reimbursement for service providers optimizes the performance and increases their commitment, and results in the successful implementation of the electronic referral system (8).

Another topic that the interviewees mentioned was social commitment. In today's competitive environment, more commitment from employees to the goals of the organization has become the demand of many organizations. Just as an organization must think about the interests of society and social accountability in order to achieve its long-term goals, these organizations expect that their employees, in turn, do not prefer personal gain to the interests of the organization (21). The findings stated that the most important need of the people is to receive timely and appropriate services. In Iran, with the launch of electronic queuing and its

connection to electronic referral systems, there has been an improvement in access and reduced waiting time for patients to receive specialized services.

## 5. Conclusion

The results of the current study showed that the electronic referral system has the potential to improve access, strengthen coordination, improve the quality of health services, and increase the satisfaction of service providers and recipients. In this study, using the experiences and opinions of experts and service providers and patients, the effective factors in the establishment and implementation of electronic referral systems in Iran have been determined and the findings of the study in four general categories of resource management, stewardship, stakeholder participation, and social commitment were considered as effective factors in the success of the electronic referral system by the participants. Successful implementation of electronic referral system requires the development of an action plan that correctly identifies the factors affecting the establishment and implementation, as well as the cooperation of all responsible organizations, and their effective participation can help improve the establishment and sustainability of the program. Managers and officials active in the field of health services can use this study in the establishment and implementation of electronic referral systems. Understanding the effective factors and subsequent decision-making can certainly help to advance the program and implement a successful electronic referral system.

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### Conflicts of Interest

The authors declare no conflicts of interest.

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