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Health information exchange as a method to manage healthcare costs: literature review

Hamed Mazreati[a*], Narges Azizi[b]

a Ph.D. Candidate of Information and Communication Technology Management, Department of Information and Communication Technology Management, Science and Research Branch, Islamic Azad University, Tehran, Iran

b MD, Department of Medicine, Faculty of Medicine, Tehran University of Medical Sciences, Tehran, Iran

* Corresponding author: Hamed Mazreati, hamed.mazreati@srbiau.ac.ir

Abstract

Background: Nowadays, health information exchange has been considered one of the fundamental issues in the healthcare system. Indeed, this approach requires the identification of the role and effect of the health information exchange and the challenges of its practical use in the field of the health economy.

Objective: This research aims to study health information exchange for managing healthcare costs.

Methods: There is a narrative review to analyze the process of health information exchange as a method to manage healthcare costs. 8078 papers have been received from the recognized database based on the selected keywords to achieve this aim. Furthermore, 42 of them have been studied as the major papers.

Results: Literacy and knowledge about health have a significant role in individuals' lifestyles and the economy. It has created a basic concept which is called the information economy. The results of this research are categorized into three groups: health information, health information economy (the effect of information and information exchange on the economy), and health information exchange (information sources, the advantages and the requirement of its use and challenges). This research shows that the effect of health information exchange on the economy has been understood well. Health information exchange leads to decreasing medical errors and healthcare costs. On the contrary, the lack of on-time and exact access decreases healthcare quality and increases costs.

Conclusions: The governments of the developing countries intend seriously to create facilities for the use of health information exchange.

Keywords: Information Economy; Health Information; Health Information Exchange (HIE); Health Systems; Health Economics

1. Introduction

Information is a vital source base facilitating managers' decision-making [1]. Information is described as data and knowledge utilized by intelligent systems (human and artificial) to back up their decisions. As a result, health information can surely help physicians make appropriate decisions and take proper measures to achieve good results in treating patients [2].

Health Information Technology can increase healthcare efficiency and quality, prevent medical errors, and decrease healthcare costs by focusing on the encrypted exchange of health information. New developments in health information systems have increased the implementation of these systems. Furthermore, these health registry systems provide extensive and secure access to the Information in the following cases: coordination in taking care of the patients, healthcare providers' access to the referred patients' medical records, the possibility of instant decision-making, and improvement in the quality of patient care, and also the possibility of health sectors' general access to the hospitals' data resources as well as external data sources [3].

Various diseases have significant impacts on public health, but they also exert an economic burden on communities [4, 5]. These diseases include communicable and non-communicable illnesses. The rate of communicable diseases is rising due to increased international trips, so regional diseases are easily transmitted to other parts of the world [4]. A load of non-communicable diseases is growing due to an increase in life expectancy in different countries and changes in lifestyle, diet, and physical activities [6].

On the other hand, According to the statistics provided by the International Labor Organization, millions of laborers from all over the world are exposed to different work-related diseases such as mental and musculoskeletal disorders without any preventive measures, in such a way that every year, about 2 million laborers die due to occupational diseases in the world [7]. Occupational Safety and Health (OSH) is associated with the economic activities which are constantly developing and advancing. On the other hand, occupational injuries have increased in agriculture, mining, transportation, and manufacturing. However, developing countries are planning their economic growth regardless of the effect of health on the economy [7]. Concerning the growing economic burden, there is a dire need to assess the costs and advantages of investing in preventing and controlling these diseases. The findings from these assessments can provide the governments with important evidence for decision-making [5].

Nowadays, demand for home care and home visits is rising, especially for aging patients. Regarding this trend, managing accessibility and routing costs to home patients by health care providers have become more critical. One of

the most important ways to optimize these costs is a hybrid ant colony algorithm, with advantages like reducing care costs by declining patients' total distance and accessibility [8].

Due to economic issues and a rise in the number of patients, especially the elderly, health care systems have faced serious problems. Home hospitalization is a method for reducing the costs of health care systems, especially at the time of the covid-19 pandemic. The main problems for this method are difficulty in managing time and declining routing costs for patient's home visits, which can be resolved by artificial intelligence methods [9].

Another major problem of health care systems for patients' home care is optimizing healthcare providers' workload. This problem can be solved by an original hybrid algorithm combining memetic and ant colony optimization algorithms [10].

Many institutions collect, analyze and share customers' personal health information using techniques such as business intelligence and data mining [11].

The context for this exchange is provided to exploit health information. Health Information Exchange transfers patients' electronically-stored health and administrative information such as laboratory results, clinical summaries, and prescriptions across health institutions, databases, and groups (payers, consumers, providers, etc.) based on national standards [12].

HIE technologies help physicians access patients' past clinical Information and decrease the need for diagnostic tests and treatment expenses [13]. Regarding a systematic research review conducted on published articles from 2005 to 2016, it has been revealed that Health Information Exchange is considered a great potential for health information systems and can promote the quality of patient care and reduce related costs [1].

The objective of this paper is a review investigation of published articles in the field of Health Information Exchange as a method for managing healthcare expenses.

2. Methods

This paper is considered a narrative-review article. In order to find the documents related to Health Information Exchange, articles dating from 2005 to 2020 and from February 2020 to November 2020 were investigated with a search strategy in the English language. Search strategies were performed on the following databases:

PubMed, SID

Primary search keywords are as follows: Health Information Exchange (HIE), Health Information Economy, Health Information Technology, Health Information, Health System, Information Economy, and Health Economics.

Publications were selected based on the inclusion and exclusion criteria.

The study's inclusion criteria are: Full-text publications and articles have been published in the English language.

The exclusion criteria are: Duplicated articles and the ones providing asymmetric Information focusing on Health Information Exchange (HIE) were excluded. The results of the inclusion and exclusion search are shown in Figure 1.

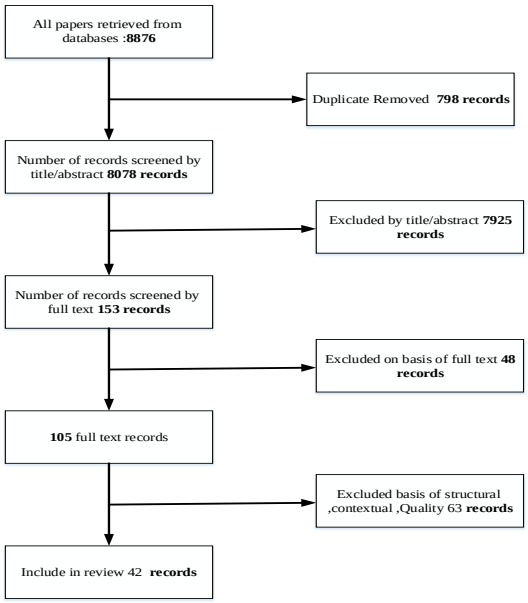

Figure 1. Literature flow diagram of inclusion/ exclusion criteria

The major subject of Health Information Exchange (HIE) is categorized in Table 1 as a method to manage healthcare costs in three groups (Health Information, Health Information Economy, and Health Information Exchange (HIE).

3. Results

8078 thorough review of the title excluded 798 duplicated studies. Finally, after a comprehensive examination of the remaining articles, 42 studies met the inclusion criteria for the study. The selected studies information is presented in Table 1.

Table 1. Category of health information exchange topics in selected articles

Authors	Title	Journal	Year	Health information	Health information economy	Health information exchange	Ref
Zhang, X., et al	What motivates physicians to share free health information on online health platforms?	Information Processing & Management	2020	•			[14]
Guerrazzi, C. and S.S. Feldman	Health information exchange: What matters at the organizational level?	Biomedical Informatics	2020			•	[15]
Vest, J.R., et al	The complementary nature of query-based and directed health information exchange in primary care practice	The American Medical Informatics Association	2020			•	[16]
Bertram, M.Y., et al	Investing in non-communicable diseases: an estimation of the return on investment for prevention and treatment services	The Lancet taskforce on ncds and economics	2019		•		[9]
Smith, K.M., et al	Infectious disease and economics: The case for considering multi-sectoral impacts	One Health	2019	•			[4]
Kugbey, N., A. Meyer-Weitz, and KO Asante	Access to health information, health literacy and health-related quality of life among women living with breast cancer: Depression and anxiety as mediators	Patient Education and Counseling	2019	•		•	[17]
Novak, S. and N. Djordjevic	Information system for evaluation of healthcare expenditure and health monitoring	Physica A: Statistical Mechanics and its Applications	2019		•		[18]
Meri, A., et al	Modelling the utilization of cloud health information systems in the Iraqi public healthcare sector	Telematics and Informatics	2019		•	•	[19]
Cisu, T.I., G.C. Mingin, and L.S. Baskin	An evaluation of the readability, quality, and accuracy of	Pediatric Urology	2019			•	[20]

Authors	Title	Journal	Year	Health information	Health information economy	Health information exchange	Ref
	online health information regarding the treatment of hypospadias						
Jin, S.W., Y. Lee, and D.A. Dia	Analyzing paths from online health information seeking to colorectal cancer screening using health literacy skills frame and cognitive mediation model	Patient Education and Counseling	2019			•	[۱۸]
Connelly, K., et al	Patients' perceived health information needs in inflammatory arthritis: A systematic review	Seminars in Arthritis and Rheumatism	2019			•	[۸۲]
Han, X., et al	Expanding Health Information Exchange Improves Identification of Frequent Emergency Department Users	Annals of Emergency Medicine	2019			•	[۸۳]
Shen, N., et al.	Understanding the patient privacy perspective on health information exchange: A systematic review	Medical Informatics	2019			•	[۸۴]
Sadoughi, F., S. Nasiri, and H. Ahmadi	The impact of health information exchange on healthcare quality and cost-effectiveness: A systematic literature review	Comput Methods Programs Biomed	2018	•	•	•	[۱]
Esmaeilzadeh, P	Healthcare consumers' opt-in intentions to Health Information Exchanges (HIEs): An empirical study	Computers in Human Behavior	2018		•	•	[۱۱]
Davidson, E., A. Baird, and K. Prince	Opening the envelope of health care information systems research	Information and Organization	2018			•	[۸۵]
Lin, H.-C. and C.-M. Chang	What motivates health information exchange in social media? The roles of the social cognitive theory and perceived interactivity	Information & Management	2018	•		•	[۸۶]
Sebetci, Ö	Enhancing end-user satisfaction through technology compatibility: An assessment on health information system	Health Policy and Technology	2018	•		•	[۸۷]
Liobikiene, G.	The determinants of	Health Policy	2018	•			[۸۸]

Authors	Title	Journal	Year	Health information	Health information economy	Health information exchange	Ref
and J. Bernatoniene	access to information on the Internet and knowledge of health related topics in European countries						
Daniel, O.U	Effects of health information technology and health information exchanges on readmissions and length of stay	Health Policy and Technology	2018		•		[۲۹]
Redston, S., S. de Botte, and C. Smith	Resolving embarrassing medical conditions with online health information	Medical Informatics	2018			•	[۳۰]
Holden, R.J., et al	Health information management practices in informal caregiving: An artifacts analysis and implications for IT design	Medical Informatics	2018			•	[۳۱]
Vest, J.R., et al	Adoption of Health Information Technology Among US Nursing Facilities	American medical directors association	2018			•	[۳۲]
Abdelhamid, M	Greater patient health information control to improve the sustainability of health information exchanges	Biomedical Informatics	2018			•	[۳۳]
Sarzynski, E., et al	Eliciting nurses' perspectives to improve health information exchange between hospital and home health care	Geriatric Nursing	2018			•	[۳۴]
Gracia-Arnaiz, M	Taking measures in times of crisis: The political economy of obesity prevention in Spain	Food Policy	2017		•		[۱]
Kash, B.A., et al	Review of successful hospital readmission reduction strategies and the role of health information exchange	International Journal of Medical Informatics	2017		•	•	[۳۵]
Shapiro, J.S., et al	Health Information Exchange in Emergency Medicine	Annals of Emergency Medicine	2016			•	[۳۶]
Akhlaq, A., et al	Barriers and facilitators to health information exchange in low- and middle-income country settings: a systematic review	Health Policy Plan	2016			•	[۳۷]
Haegerich, T.M., et al	Improving injury prevention through	American Journal of	2015	•			[۳۸]

Authors	Title	Journal	Year	Health information	Health information economy	Health information exchange	Ref
	health information technology	Preventive Medicine					
Mrema, E.J., A.V. Ngowi, and S.H. Mamuya	Status of Occupational Health and Safety and Related Challenges in Expanding Economy of Tanzania	Annals of Global Health	2015		•		[۷]
Rahurkar, S., J.R. Vest, and N. Menachemi	Despite The Spread Of Health Information Exchange, There Is Little Evidence Of Its Impact On Cost, Use, And Quality Of Care	Health Affairs	2015		•	•	[۷۴]
Park, H., et al	Can a health information exchange save healthcare costs? Evidence from a pilot program in South Korea	International Journal of Medical Informatics	2015		•	•	[۴۱]
Ebrahimi, K., M. Roudbari, and F. Sadoughi	Health Information Economy: Literature Review	Global journal of health science	2015	•	•		[۶۳]
Mandl, Kenneth D., Joshua C. Mandel, and Isaac S. Kohane	Driving Innovation in Health Systems through an Apps-Based Information Economy	Cell Systems	2015		•		[۴۰]
Jung, H.Y., et al	Use of Health Information Exchange and Repeat Imaging Costs	American College of Radiology	2015		•		[۴۲]
McMurray, J., et al	Ontological modeling of electronic health information exchange	biomedical informatics	2015			•	[۷۳]
Adler-Milstein, J. and A.K. Jha	Health information exchange among U.S. hospitals: who's in, who's out, and why?	Healthcare	2014			•	[۴۳]
Hincapie, A. and T. Warholak	The impact of health information exchange on health outcomes	Applied Clinical Informatics	2011		•	•	[۸۱]
Jeremy C Wyatt and F. Sullivan	ABC of health informatics What is health information?	BMJ	2005	•			[۱]
Euchi, Jalel	Do drones have a realistic place in a pandemic fight for delivering medical supplies in healthcare systems problems?	Chinese Journal of Aeronautics	2020	•			[۴۴]
Patel, Piyush Gohil, Piyush	Role of additive manufacturing in medical application COVID-۱۹scenario: India case study	Journal of Manufacturing Systems	2020	•			[۴۴]

The main subject of Health Information Exchange (HIE), considered a method for managing healthcare costs, is divided into 3 major categories: Health Information, Health Information Economy, and Health Information Exchange, which are indicated in Table 1.

In the first section, health literacy and the role of Information in healthcare systems have been studied. The second section investigates the health information economy and the role of information and information exchange in health systems and treatment costs. The third section deals with Health Information Exchange as one of the practical factors in healthcare expenses. In this section, the required information sources for creating such context, advantages, challenges, and solutions are examined.

4. Discussion

Research on Health Information has turned into a focal point in information systems, suggesting that: 1) There is an increase in the publication of suchlike articles in eminent journals concerning health information systems. 2) Such research is recognized as a new developing phenomenon in healthcare [25].

4.1. Health information

Health literacy has a direct impact on life quality [17]. Data, treated as raw material, is the content of any activity, production, and service whose process includes production, collection, processing, and dissemination. Nowadays, the presence of valid Information and its ability to manufacture low-cost goods and offer inexpensive services is considered a crucial factor in economic development [39, 45]. Individuals require Information about diseases and possible treatments in order to be able to deal with the illnesses and make informed decisions [26]. Similarly, studies show that physicians' online sharing of health information benefits patients and can also decrease health inequity [14].

Additive Manufacturing (AM) is one industry that plays a crucial role in emergencies such as the COVID-19 pandemic is Additive Manufacturing (AM). An approach by this industry is the implementation of 3D printers to provide medical tools like ventilators and face masks; in addition, there are benefits of using 3D printing for drones [44].

An emerging technology for real-time monitoring and online information collection is drone technology. Considering the COVID-19 pandemic in 2020, these drones can provide fast and easy access to remote areas, patient specimen gathering and delivery to labs in optimal time, reduction of patient contact, body temperature monitoring with thermal cameras, and drug delivery patients [8].

Presently, health organizations have found the importance of making investments in health information to increase quality and reduce costs [27]. Thus, creating a platform in this context, which represents comprehensive Information on the subjects associated with health, can increase the individuals' knowledge level in the health field [28].

4.2. Health information economy

The information economy has passed behind different paradigms that can be divided into four approaches which are as follows: information evaluation, information technology, asymmetric Information, and information value [39]. Due to its clinical Information, the issue of a health information economy is considered more complicated than in other fields of information economy [39]. On the one hand, according to the increase in costs related to healthcare in all developed countries, studies show that electronic health systems have had a significant impact on the successful management and cost reduction [18]. According to a study conducted in Tanzania, the laws and regulations related to occupational health should be strengthened and corrected to enhance occupational health and safety, affecting economic growth [7].

4.3. The role of Information in the economy

The value of Information is one of the essential aspects of Information Economy theories [39]. In developed countries such as the United States, a 6 billion-dollar investment has been made in information technology during a 6-year program, applied to healthcare to store electronic healthcare records through modern and advanced systems in the contexts of the web, mobile phones, etc. Moreover, it resulted in a return on revenue in the shortest possible time duration [40]. It is generally believed that Health Information Exchange contributes to reducing medical errors and administrative costs [11]. Because poor access to timely and comprehensive Information leads to a decrease in healthcare quality and an increase in costs [1]. Given a 17-month study conducted in hospitals in South Korea, it has been revealed that in those wards where Health Information Exchange has been utilized, there exists a reduction of about 13% in total costs as well

as a 54%, 76%, 73%, and 80% reduction in the costs of laboratory tests, pathobiological diagnosis, function tests, and diagnostic imaging respectively [13].

Healthcare institutions, particularly physicians, must access the patient health information collected in different systems [1]. With this end in view, cloud processing services are used to decrease costs, create a context for management and health information retrieval, monitor the patients' conditions anywhere and anytime, and finally serve as a reliable solution to store Information [19]. The traditional and paper exchange of patient medical information has been considered inefficient. So, new systems (cloud computing and communication technologies) help exchange this Information to enhance the efficiency and flexibility of healthcare services by creating a secure infrastructure [11]. Moreover, Health Information Exchange (HIE) can increase efficiency, reduce healthcare costs, improve patient outcomes, and reduce diagnostic tests, imaging, and related costs [46].

4.4. The role of information exchange in the economy

The results of a study conducted in 13 western regions of New York from 2009 to 2010 suggest that applying Health Information Exchange can annually save about 32460 dollars spent on inevitable duplicate imaging, i.e., 2.57 dollars for every patient, regarding the fact that Medicare Federal program has spent only 10 billion dollars every year on medical imaging [41]. The research review carried out on MEDLINE and PubMed databases from 2006 to 2016 to investigate the investment made by the United States in Health Information Exchange technologies indicates that an inadequate number of articles deal with the role of Health Information Exchange as a reducing factor for the readmission of the patients [35]. However, several studies show that in the institutions which have obtained a high grade in health information technology and Health Information Exchange and constantly take good care of the patient documents, the rate of discharged patients' return has improved for 30 days, without any effects on the length of the hospitalization period resulting in a reduction in the costs for unnecessary admission and treatment quality [29]. This cost reduction has taken place due to the implementation of the context of Health Information Exchange, which is a considerable reduction of 26.52 dollars in the existing costs in every reference to the hospital [12].

4.5. Health information exchange

Health Information Exchange is generally defined as the electronic exchange of clinical data among different healthcare providers [15]. The process of the Health Information Exchange - the exchange of the patient information by the providers – is performed in two ways: Directed and Query-based. The Directed Exchange data such as test results, imaging reports, and healthcare documents are sent by one service provider and received by another. Furthermore, since the sender shares the patient Information, this Directed Exchange is known as a "push" transaction. This process is conducted chiefly automatically. On the other hand, a query-based exchange is referred to as a "pull" transaction because the current healthcare provider asks the primary providers for all of the patient's relevant clinical data [16].

4.6. Information sources

Although several local data management procedures, such as pharmacy systems, etc., are applied in many hospitals, the investment rate in health information technologies is still low among healthcare providers [38]. So, specialists, television, and radio are considered the most important sources of information. However, in some studies, television, and radio are ranked at the lowest level of importance, which is affected by the personal characteristics of the target community, such as age, gender, and education level [17].

One of the critical factors of health information technology is the interaction between the patient and physician [25]. In other words, access to online information sources such as the internet has considerably changed the relationship between the patient and physician. According to a study, it has been revealed that 70% of the patients find the internet sites reliable [20]. Nowadays, as a result of individuals' trusting online health information, they can get the answers to their questions that they cannot propose in person (due to the shame) [30]. On the other hand, online searching for health information positively relates to information redundancy and health literacy, but information redundancy has a negative relation with health literacy [21]. However, specific patients' access to the Information, such as those with rheumatoid arthritis, has contributed to their satisfaction and improvement of treatment outcomes [22]. The other source applied in less developed countries is non-specialists who have challenged the validity of the prescribed treatment methods [17].

4.7. The advantages and the necessity of the applying health information exchange

Governments and institutions have always been attempting to apply Health Information Exchange to improve the quality and effectiveness of treatments with the help of access to health information provided by healthcare service providers for the other ones [13]. Consequently, healthcare services often try to achieve an integrated and reciprocal information system to improve decision-making in the medical process and increase their efficiency [1]. Physicians use health data to decide on patient care. However, since patients refer to several different centers for receiving medical care, there exists no thorough access to the patient health records [36]. Health specialists and policymakers in the health field consider Health Information Exchange to improve the patients' safety and general quality of their care [1]. Health Information Exchange (HIE) and the exploitation of health information can contribute to policymakers' informed decisions to enhance the health of the patients and community [37]. Moreover, measures concerning managing Protected Health Information help support the management of daily care; healthcare receivers' decision-making by getting Information as well as the integrity and consistency of various sources and records; maintenance; updating and application of Information over time; along with information sharing; connection with healthcare specialists and other family caregivers [31].

The emergency department is one of the critical matters for physicians' decision-making. In this situation, they need to make quick and careful decisions while there is little access to the Information [32]. With this end in view, a study was conducted in 31 hospitals in New York and showed that the utilization of Health Information Exchange in the emergency departments had improved the recognition of the patients' conditions [23]. Other advantages are Health Information Exchange improvement in patients' satisfaction, safety and a decline in unnecessary admissions, duplicate testing, and medication hazards [11].

4.8. The challenges of applying health information exchange

4.8.1. The individual challenge

Privacy, security, and local policies are some of the challenges that stand in Information Exchange [19]. In other words, the consumers of these services are concerned about their digital information privacy [11]. However, investigations show that suchlike concerns do not hinder the implementation of health information technologies consumers of these services are concerned about their digital information privacy. Individual concerns can be decreased through education on Health Information Exchange [24]. On the other hand, based on a study conducted in Iraq hospitals, it has been revealed that system compatibility, system complexity, security, and privacy had affected the use of the physicians [19].

Patients are likely to think that their individual information will be used for commercial goals, which is one of the crucial risks [11]. Indeed, patients' awareness of the value of Health Information Exchange is crucial in decreasing their concerns about privacy [24]. In such a way, patients' more control over sharing health information can lead to more satisfaction, and consequently, their concerns will go away. Therefore, more control results in more trust between the patient and the healthcare service provider and protected infrastructure for Health Information Exchange [33]. Health Information Exchange meets other significant challenges: inattention to Information in decision-making, corruption and insecurity, lack of training, and poor infrastructures [37].

4.8.2. Cooperation challenge

According to the official statistics, there has been a 30% reduction in the cooperation of hospitals with primary care clinics regarding the patients' readmission rate due to the integration of Health Information Exchange in acceptance plans of health services [35]. A rule which was set in 2009 in the field of Health Information Exchange along with the budget and financial incentives encouraged the American hospitals to accept Health Information Exchange in such a way that in 2013, about two-thirds of the hospitals as well as half of the physicians had participated in this plan [46]. In other words, in 2013, the cooperation rate was different from 30% to 70% in the hospitals in the United States [42]. Therefore, in March 2010, the United States *Department of Health & Human Services (*HHS) donated 162 million dollars to 16 states to exploit Health Information Exchange, considering the impact of Health Information Exchange on healthcare quality [12]. Furthermore, a study on nurses in the United States shows that organizational culture can promote awareness through professional communities and facilitate more admissions and the effectiveness of information technology [32].

4.8.3. Information and communication challenge

Factors such as quality of Information, system quality, backup sources, and compatibility of technologies

significantly impact users' satisfaction with health information systems [27]. Moreover, many financial, technical, and organizational parameters may cause unwillingness to use the context of Health Information Exchange. Nevertheless, the most critical factor is the lack of the patients' cooperation and acceptance, resulting in incomplete information recording [11]. On the other hand, social media play an important role in exchanging health information. A study of Facebook social network users who had experienced Health Information Exchange demonstrated that person-to-person interaction, human-information interaction, expected output of health self-care, and expected output of the social relationships had had considerable influences on the behavior of Health Information Exchange [26].

The other problem is healthcare at home; 25% of the elderly keep receiving the same services at home after receiving healthcare for heart failure in the hospitals. This issue has created a challenge in exchanging healthcare information from hospital to home regarding poor medication management, ineffective communication, technology-related issues, and patient-related factors [34].

4.8.4. Responding to challenges

For using information technology in the domain of individual health information management, it is needed to observe privacy and security; customization and flexibility; easy application; credibility and sensitivity; awareness of the situation; information integration; shared use; updating and protection; archiving and copying; Information and access to the Information; and validation [31]. On the other hand, strong leadership; clear policy; financial support, technology acquisition; improvement of the communication network; education provision; and structural, political, and financial considerations in countries with low and middle income are essential in implementing Health Information Exchange [37].

5. Conclusion

Analysis of the articles indicates that the issue of Health Information Exchange is receiving more attention and also its use in the context of community healthcare services is of great importance, in such a way that a majority of developed countries, given the financial budgets and incentives, are trying to create a context for Health Information Exchange and promote the cooperation of organizations and institutions which provide healthcare services. On the other hand, nowadays the organizations in the health field have found out about the importance of investing in health information to increase the quality of their services, reduce their costs, and provide low-cost goods and services with the help of valid Information and the ability to utilize it in the form of electronic health systems. In developed countries, healthcare and storage of electronic medical records through information exchange systems have resulted in a return on revenue in the shortest possible time.

Health Information Exchange decreases medical errors, healthcare costs, the need for diagnostic tests and imaging, and also administrative costs; because poor access to timely and comprehensive Information leads to a decrease in healthcare quality and an increase in costs

Thus, governments have realized the importance of Information and its impact on the economy in such a way that they have taken necessary measures for the production, collection, processing, and dissemination of Information in healthcare systems. Since there exist some challenges and risks in establishing any information context and sharing

individual and organizational Information, more sensitivity can be detected in disseminating and sharing individual Information. Therefore, protecting individuals' privacy is of significant importance.

On the other hand, although disease prevention is an influential factor in reducing healthcare and economic costs, it has been studied inadequately in articles. Consequently, it is highly recommended that the subsequent studies deal with the impact of Health Information (HI) on disease prevention and its effect on the economy.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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