




Virtual visit evaluation from the perspectives of physicians and patients: A qualitative study in a developing country

Parastoo Amiri¹, Elahe Jozpour¹, Ladan Kouhgardzadeh², Kambiz Bahaadinbeigy³, Moslem Soofi⁴, Ali Mohammadi^{5*}

¹Department of Health Information Technology, School of Allied Medical Sciences, Lorestan University of Medical Sciences, Khorramabad, Iran

²Department of Radiology and Medical Physics, School of Allied Medical Sciences, Lorestan University of Medical Sciences, Khorramabad, Iran

³Digital Health Team, The Australian College of Rural and Remote Medicine, Brisbane, QLD, Australia

⁴Department of Health Information Technology, Faculty of Paramedical Sciences, Kermanshah University of Medical Sciences, Kermanshah, Iran

⁵Medical Informatics Research Center, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran

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* Corresponding author:

Ali Mohammadi

Medical Informatics Research
Center, Institute for Futures Studies
in Health, Kerman University of
Medical Sciences, Kerman, Iran

Email: a.mohammadi@kums.ac.ir

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ABSTRACT

Introduction: Many patients, especially in rural and remote areas, face the problem of unavailability of specialists. Today, virtual visit technology is used by the public as a solution to solve the problem of lack of access to specialists and reduce unnecessary costs. Therefore, the purpose of this study is to identify the strengths, weaknesses, opportunities and threats (SWOT) of the virtual visit system from the point of view of physicians and patients.

Material and Methods: This cross-sectional qualitative study was conducted from June to August 2023 in Kermanshah. Semi-structured and in-depth interviews were conducted face-to-face with five physicians and ten patients. All interviews were transcribed verbatim. Data analysis utilized the SWOT framework and the software Atlas.ti8.

Results: The results of this study revealed that virtual visits have strengths such as minimal infrastructure requirements, cost reduction, and human resource efficiency. Weaknesses include the absence of physical examination, reduced quality of examinations, and limitations for certain patients. Opportunities include quick visits in remote areas and a decrease in health disparities, while threats encompass potential privacy breaches, violation of patient information confidentiality, lack of motivation among health users, and limited access to technology.

Conclusion: Based on the study findings, in healthcare crises, telemedicine technology proves effective in providing primary healthcare services. Telemedicine plays a crucial role in health by enhancing access and reducing costs. To optimize this process, a comprehensive strategy in digital health, involving infrastructure investment and stakeholder feedback, is evident. Sharing experiences and addressing challenges empower managers to enhance healthcare services through virtual visits, adapting to the prevailing conditions.

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INTRODUCTION

Today, the combination of medical science and technology has changed the structure of the health care system in the world. As a prominent example of this combination, telemedicine has been able to provide virtual visits, electronic consultation, the possibility of improving patient care, access to health

services in remote areas, and reducing costs and travel. Of course, using a virtual visit, especially through a mobile phone, is not a new thing. So that during the outbreak of the Covid-19 virus, many patients' affairs such as initial examinations for diagnosis and even treatment was done through telephone calls [1, 2]. This caused this work to be more specialized in the form of a virtual visit. In such

a way that in the form of a special platform (such as a website, an application) the physician communicates with her patient in the form of voice, video, or message [3, 4].

The most important advantage of a virtual visit is that it is not limited to time and place. So that patients can participate in the virtual visit from anywhere, including their home, workplace, or even their parked cars. Also, many patients prefer a virtual visit to an in-person visit because they do not have to travel long distances, take time off from work, pay for parking, or arrange childcare [5-7]. These advantages of virtual visits have been very effective in reducing the burden of visiting medical centers in-person [8]. In 2017, a randomized trial of 195 Parkinson's patients found that a virtual home visit saved an average of 38 miles and 88 minutes of patients' time compared to a face-to-face visit [9]. Another study showed that the virtual visit was feasible and acceptable and produced similar clinical results compared to in-person patient groups in an interdisciplinary obesity treatment program for adolescents in Ontario, Canada [10].

The correct and effective communication between the physician and the patient in the virtual visit can play a very important role in the acceptance of this technology. A qualitative study in the United States also showed that, similar to office care, it seems that patients' perception of the quality of care in virtual visits is strongly related to the quality of patient-provider interpersonal interaction [11]. A study in 2016 stated that for patients and care providers, only the quality of care is important, not the type of service provided [12]. Despite the stated advantages, there are always concerns about the quality of care provided through virtual visits [13, 14]. As an example, we can mention the lack of physical examination, lack of continuity of care, low level of electronic literacy, especially in the elderly, and lack of access to the necessary technology in virtual visits [13, 15, 16]. In the study of general surgery outpatients conducted in 2018, 123 (55%) of 223 patients reported that despite saving time and money in a virtual visit, they prefer a face-to-face visit over a virtual visit [17].

Due to the fact that nowadays all people in the society are in some way connected with the virtual world, therefore there are growing requests for virtual healthcare visits by healthcare professionals, policy makers, and industry leaders [18]. Although several studies have described the rapid expansion of virtual visits, knowledge about the attitude of physicians and patients is very important and practical to understand the feasibility of caring for patients using virtual visits. A systematic review found that virtual visits require extensive changes in work practices and significant time to learn new techniques, and these demands affect both the efficiency and

effectiveness of care [19]. Therefore, in this study, we decided to identify the capabilities, weaknesses, opportunities and threats (SWOT) of virtual visit systems from the perspective of the beneficiaries (physicians and patients) of Kermanshah province.

MATERIAL AND METHODS

The present study was conducted based on the standards of qualitative research reporting (SRQR). This qualitative-exploratory study was conducted from the beginning of June to the end of August 2023 in the city of Kermanshah, Iran.

Characteristics of the participants

The purposeful sampling method was used to select the participants in the interviews. Participants included physicians and patients. The criterion for selecting patients was their use of virtual visit services (such as audio, video, chat). The criterion for selecting physicians was their use of virtual visit services and at least 5 years of work experience. Finally, the data reached saturation point in the 10th interview of the patients and the fifth interview of the physicians from Farabi and Imam Reza hospitals affiliated to Kermanshah University of medical sciences. The interviews were semi-structured, in-depth and face-to-face. The average duration of the interview was 30 minutes for patients and 15 minutes for physicians.

Data collection process

At the beginning of the interview, the second researcher gave the necessary explanations about the objectives of the study and the optionality of their participation. Also, all the people participating in the interviews were assured of maintaining the confidentiality of the information. Then, with the consent and permission of the people who wanted to participate in the interview, the comments and conversations during the interview were recorded. At the beginning of the interview, demographic questions were asked. Then questions were asked in line with the purpose of the study. The questioning guide for the interviews included four questions. These questions were: In your opinion, what are the strengths of using a virtual visit? In your opinion, what are the weaknesses of using a virtual visit? In your opinion, what are the opportunities of using a virtual visit? In your opinion, what are the threats of using a virtual visit?

Statistical analysis

At first, the researchers read the interviews several times to get a general understanding of them. In the next step, the text of the interviews was analyzed based on the Elo and Kyngas method [20, 21].

This method has three stages: preparation,

organization and reporting. The present study consists of two stages. The preparation stage consists of two steps: “choosing the unit of analysis” and “finding the logical connection of the data with the topic”, the organization stage consists of five steps: “creating an analytical matrix”, “extracting data from the content based on categories”, “grouping”, “classification”, and “abstract”. Finally, in the reporting phase, the characteristics of the participants, data collection, data analysis, and each of the main classes were reported in detail in the results section. During these three stages, primary codes were extracted, groups were formed, and subgroups were placed in the main subgroups.

In this research, the qualitative analysis of the interviews was done using the content analysis method. In this method, the recorded information was then typed verbatim in MSword 2020 software. Finally, the typed files were imported to Atlas.ti8 software to be coded, organized and analyzed. In this software, each semantic unit is assigned a code that indicates the meaning of the selected unit. The extracted text and codes were revised several times to determine the similarities and differences of the codes by comparing and re-reviewing and merging the similar items into sub-groups and groups.

Strengths, weaknesses, opportunities, and threats (SWOT) analysis enables the identification of internal and external factors affecting the performance of a technology. Also, this analysis is one of the main tools used to inform decision makers about the effectiveness of a technology [22]. For this reason, we considered it a suitable tool for strategic evaluation of virtual visit interventions.

Ethical considerations

In order to comply with ethical considerations and protect the rights of the participants, the second researcher of this article introduced himself and explained the objectives of the research and obtained oral consent, assuring them that the information will remain completely confidential and their details will not be mentioned. In order to maintain the confidentiality and anonymity of the patient's identity, before analyzing each interview, a unique code was substituted for the patient's name. An outside observer familiar with qualitative studies assessed data reliability.

RESULTS

Details of participants

In total, 15 interviews (10 patients and five physicians) were conducted. The average age of patients and physicians was 39 and 48.5 years, respectively. Most of the patients had a diploma or associate degree (n=6). The details of the interviews

are shown in Table 1.

Table 1: Details of interviews with study participants

Characteristics		Frequency	
		Patients (n=10)	Physicians (n=5)
Gender	Men	4	3
	Women	6	2
Average age (years)		39 years (range 23-55)	48.5 years (range 35-62)
Level of education		Diploma (3) Associate (3) BSc (2) MSc (2)	General practitioners (2) Neurologist (1) Neuropsychiatrist (1) Infectious disease specialist (1)

Content analysis to evaluate the virtual visit from the perspective of physicians and patients based on the SWOT framework showed 19 primary codes in four main themes (Table 2) as follows.

Table 2: Findings of virtual visit evaluation from the point of view of physicians and patients based on the SWOT framework

<p>Strengths A minimum infrastructure is required to conduct a virtual visit Costs are reduced because travel and other expenses are eliminated Human resources are used better Quick access to primary and secondary health care Virtual visit in emergency situations</p>	<p>Weaknesses Physical examination of patients is not possible Lack of trained personnel The physician's lack of confidence in the data given by the patient Reducing the quality of the virtual visit due to internet bandwidth and network problems Virtual visits are not suitable for patients who are illiterate or do not have access to technology.</p>
<p>Opportunities Health care support for people in remote areas Reducing health care discrimination by providing access to specialist and expert physicians for all people Speeding up the process of diagnosis and treatment</p>	<p>Threats A physician may not be available for every virtual visit. Violation of patient privacy, especially vulnerable groups during communication with the physician Violation of confidentiality of patient information, especially vulnerable groups Lack of motivation in physicians and patients to use virtual visits Lack of access to technology due to poor economic conditions Lack of proper insurance system</p>

Strengths

Meaning of strengths in SWOT studies, the actual functional characteristics and features are specific to a system compared to other systems. So as to make that system superior to others. According to the participants in this study, the following were the main strengths of using the virtual visit:

The choice of equipment (or hardware) used for a virtual visit depends on several factors, including the physical location of the physician and the patient at

the time of the virtual visit. For example, a laptop, a desktop computer with a built-in camera and speaker, and a mobile phone are among the technologies that can be used to conduct a virtual visit. In general, any technology with internet can be used to conduct a virtual visit. As a result, minimal infrastructure is required to conduct a virtual visit. To understand this, the following quote from a physician is important:

“... The device required to provide a virtual visit broadly includes smartphones, tablets, laptop computers, and desktop computers ...” (Neurologist, June 15, 2023)

Reducing healthcare costs is one of the main reasons for the interest in virtual visits. Many patients indicated that their high satisfaction with virtual visits was due to access to specialists without the need for long trips. Virtual visits can potentially affect costs and reduce costs due to reasons such as reduced travel, no need to take time off from work, shorter interactions and increased productivity of physicians by increasing the number of visits in the same period of time. To understand this, the following quote from a physician is important:

“... Virtual visit has the potential to significantly reduce patient costs in terms of money and time ...” (Neuropsychiatrist, June 21, 2023)

Participants stated that access to specialist physicians was very important to them, and virtual visits met this need. In general, virtual visit technology has improved the better use of human resources, especially the access to specialists. Faster and easier access to physicians will lead to faster access to healthcare. So that primary and secondary care will be done faster than in-person visits. Therefore, many participants stated that they prefer a virtual visit to a face-to-face visit in emergency situations, especially to gain more knowledge and information. A part of a patient's speech is clearly indicative of the choice of a virtual visit in emergency situations:

“... When I found out that I have cancer, I wanted to know what cancer is and how my body is now. I sent the results of my tests to a doctor... In those circumstances where it was difficult for me to have access to a specialist doctor in person, this virtual meeting really cheered me up ...” (Patient No.3, July 10, 2023)

Weaknesses

Weaknesses in SWOT studies mean the characteristics and internal performance defects of the system, which noticeably cause the system's efficiency to drop compared to other systems. According to the participants in this study, the following were the main weaknesses of using a virtual visit:

Although most of these platforms adjust the virtual visit quality for low bandwidth but the faster and

more reliable the Internet connection, the better the experience for the provider and the patient. For this reason, the quality of the virtual visit can be largely related to the internet bandwidth and network problems. Many of the participating physicians emphasized that the use of virtual visits may be problematic for patients who need a physical examination.

The lack of skilled/trained manpower and capable people in the field of technical services related to virtual visits in remote areas can lead to the non-acceptance of this technology. Of course, physicians' doubts about patients' statements in virtual visits have caused resistance to accept this technology from the opinion of the participating physicians in this study.

In an environment where people do not have an appropriate level of education or do not have access to technology, accepting and using virtual visits may not be easy.

Opportunities

Opportunity in SWOT studies refers to elements or developments in the external environment that a system can take advantage of. The successful implementation of the virtual visit provides many opportunities for physicians and patients. Among the opportunities faced by telemedicine in the present study, we can mention “healthcare support for people in remote places”, “reducing health care discrimination with access to specialist and expert physicians for all people”, and “Accelerating the process of diagnosis and treatment”.

Most participants in this study were aware of the potential opportunities to improve care through the use of virtual visits for people in remote areas. Also, the start and end of the virtual visit by clicking a button on a computer or mobile phone, instead of a physical waiting room and traveling long distances, will lead to the reduction of discrimination in healthcare for people in the community. This will accelerate the process of diagnosis and treatment.

Threats

Threats in SWOT studies are elements or developments in the external environment that can harm a system. According to the participants in this study, the following were the main threats of using virtual visits:

Since in the virtual visit it is necessary to access the patient's clinical information, a critical obstacle in the use of virtual visits is the challenges related to the violation of privacy and confidentiality of patient information. These challenges are not created by the virtual visit itself, but the method of using the virtual visit will lead to these problems. The statement of one of the participating physicians in this study expresses

this important matter well:

"... Medical obligations in the field of virtual visits in our own country (Iran) do not have a clear definition..."
(General practitioners, August 3, 2023)

Before providing any service to the society, people should be prepared to accept it. The lack of motivation of physicians and patients in using virtual visits will lead to the failure of projects related to this technology. The statement of one of the patients participating in this study expresses this important matter well:

"... The government should rationally convince people to use virtual visits when sick..." (Patient No.7, July 15, 2023)

People may not have access to computers or mobile phones in remote areas due to economic problems. In this case, implementing and providing virtual visit services may lead to losses.

DISCUSSION

Today, the advancement of information and communication technology, especially in the field of health, has brought significant changes in the provision of medical services. Virtual visit systems have emerged as new processes in communication between physicians and patients, which provide the possibility of providing healthcare services in virtual space. Despite these developments, it is necessary to evaluate these systems from different angles so that their capabilities, weaknesses, opportunities and threats are clearly defined. In this study, an attempt was made to provide a comprehensive evaluation of virtual visit systems by focusing on the perspectives of physicians and patients. This evaluation will not only help us to examine the positive and negative effects of these systems in achieving health and treatment goals, but also provide the possibility to make suggestions to improve their performance. Based on this, the real opinions and experiences of physicians who have used these systems and the opinions of patients who have had the experience of receiving medical services through a virtual visit were examined as the main sources. The current research examines the possibilities and challenges in remote visit systems in a comprehensive way and deals with SWOT analysis based on the viewpoint of the main actors of these systems. This analysis reveals the internal strengths and weaknesses of the systems along with the opportunities and threats of their external environment. The current research aims to create foundations for the continuous improvement of virtual visit systems and increase user satisfaction with these services, and is considered an important step towards improving the health of society and increasing the effectiveness of healthcare services.

One of the goals of the present study was to examine the strengths of virtual visit systems from the

perspective of physicians and patients. The results of this study showed that, in terms of strengths, the virtual visit system has facilities that have a significant effect on improving the provision of healthcare services. The first strength of this system is to reduce the need for complex infrastructure that is required to conduct a virtual visit. Also, by eliminating the costs related to travel and other unnecessary side costs, the costs associated with this service are significantly reduced. In addition, this system provides a better possibility to use human resources. Quick access to primary and secondary health care is also considered among the advantages of this system, which allows patients to access medical services quickly and effectively. In addition, this system provides the possibility of virtual visits even in emergency situations, which is very important in maintaining the health of the individual and society. These results were consistent with the results of some similar studies. For example, the results of studies by Zhai et al. showed that telemedicine platform have capabilities which can act as an effective auxiliary tool in dealing with the spread of diseases and facing critical situations in environments with a high level of uncertainty [23]. Also, the results of the study by Litvak et al. showed that the use of virtual visits can be effective for assessing the condition of patients in disaster management, providing direct medical services, and remotely monitoring the condition of patients [24]. The research conducted by Basu et al. with the aim of investigating the use of telemedicine services during the COVID-19 pandemic crisis shows that it is possible to use telemedicine solutions as an effective solution, causing continuity and strengthening primary healthcare systems [25].

Another goal of the present study was to investigate the weaknesses of virtual visit systems from the point of view of physicians and patients. The results of this study showed that the virtual visit system, despite the advantages and facilities that provide health and treatment services in virtual space, also faces several weaknesses. This system does not provide the ability to physically examine patients, which can create limitations in the diagnosis and treatment of cases that require direct care. Also, the lack of trained personnel in this field may lead to increased problems and inefficiency. On the other hand, the physician's lack of confidence in the data provided by the patient is a problem that may lead to a decrease in the accuracy of diagnosis and treatment. The decrease in the quality of the virtual visit due to the limitation of the internet bandwidth and network problems can affect the patients' experience. Finally, the virtual visit is not suitable for patients who are not literate or do not have access to technology, which indicates a lack of attention to the needs of vulnerable groups in this system. These challenges indicate the need to improve and optimize this

system in order to increase the quality and effectiveness in providing healthcare services through the Internet. These results were consistent with the results of some similar studies. For example, Browning et al.'s research findings showed that approaches to using telemedicine services requires the presence of a trained workforce from health professionals. These professionals must have the ability to understand and accept patient-centered care and they should also have the necessary skills in the field of behavior change and counseling principles [26]. Also, the research conducted by Hong et al. showed that in many developing countries, there are no laws to support the provision of telemedicine services [27]. The results of the study by Keshvaridoost et al. showed that in developing countries, providing adequate health facilities is an important challenge [28]. The results of research by Loeb et al. [29] have shown that in developing countries, it is possible that the provision of telemedicine services, especially in remote and rural areas, is not fully practical due to the limited use of smart devices and the lack of development of high-speed internet networks.

Another objective of the current study was to investigate the opportunities created by virtual visit systems from the perspective of physicians and patients. The results of this study showed that the use of virtual visits as a new system in the communication between physicians and patients provides many opportunities to the society. These opportunities include healthcare support for people in remote areas, which facilitate access to healthcare services for these people. Also, it reduces healthcare-health care discrimination, because by this system, access to specialist and expert physicians is provided to all people. One of the other opportunities of this system is to accelerate the process of diagnosis and treatment, which improves the weak points in traditional processes by improving the speed of providing medical services. These results were consistent with the results of some similar studies. For example, the research results of Jaramillo et al. showed that remote monitoring is one of the applications of remote medicine. This method allows healthcare providers to monitor patients in settings outside health facilities, such as homes [30]. The research conducted by Li et al. showed that the use of virtual visit technology can be effective for screening people suspected of influenza and covid-19, monitoring the health status of children, evaluating the status of the elderly, veterans, and periodical monitoring of pregnant mothers. This telemedicine method is brought as an efficient tool during the outbreak of covid-19 [31]. The results of the research conducted by Patel et al. showed that one of the effective uses of virtual visit is to use it as a source of medical information [32]. The results of Liu et al.'s research in China have shown that the process of

collecting and processing information can provide the conditions for virtual visit to be effective as a decision-making tool for health service providers and decision-makers [33].

Another goal of the current study was to investigate the possible threats of virtual visit systems from the point of view of physicians and patients. The results of this study showed that virtual visits also have threats. Violation of the privacy of patients, especially vulnerable groups, during communication with the physician is one of the things that reduce patients' trust in this system. Also, violation of the confidentiality of patients' information, especially vulnerable groups, can lead to serious problems in maintaining personal privacy and medical information. A lack of motivation in physicians and patients to use virtual visits can also be one of the main obstacles, possibly due to insufficient commitment or unstable experience in using these systems. These results were consistent with the results of some similar studies. For example, the results of the research of Golinelli et al. showed that during the implementation of telemedicine services, it is necessary to pay attention to the challenge of confidentiality of patient data, because this issue may affect the success of using telemedicine [34]. The results of the research conducted by Li et al. showed that in the self-management of patients, it is important that telemedicine software is deployed in a user-friendly way and also provides access to online help for people with low technology skills [31].

Future research should evaluate the experiences of healthcare professionals and patients in utilizing virtual visits in various geographical conditions. Also, there is a need to conduct research on the limitations that may reduce the motivation of health users to use telemedicine services. Of course, it is necessary to conduct studies in the field of data security and privacy protection in virtual visits and provide solutions to prevent them.

This study had 6 limitations. First, this study was conducted solely among experts in the city of Kermanshah; hence, the generalizability of the results to other regions may be limited due to the existence of diverse conditions in different areas. Secondly, the study sample consists of five physicians and ten patients, which may not fully represent all physicians and patients. The study results may be influenced by individual differences. Thirdly, the study was conducted until August 2023. Conditions and technology may change over time; therefore, the study results may lack the ability to be extrapolated to the future. Fourthly, the study employed a qualitative approach, and the results heavily rely on the opinions and experiences of individuals, which may vary with the personal mindset of other experts. Fifthly, the study was based on semi-structured interviews with physicians and patients, and some

crucial aspects of the issue may have been overlooked from the perspectives of other individuals. Sixthly, the SWOT framework alone may not comprehensively examine all aspects and impacts, and it may not provide a comprehensive critique of remote medical technology.

CONCLUSION

The results of this research show that in times of health crises, the use of virtual visit technology can be effective in providing primary health services. Currently, virtual visit technology is known as a solution to solve the problems of physical access to health services, although it cannot completely solve structural problems, but it certainly improves capabilities, operational efficiency and accessibility and it also helps to reduce time pressure and costs in the long time. To optimize virtual visit in the field of primary healthcare, it is necessary for countries to adopt a comprehensive digital health strategy which includes investment in infrastructure such as electronic health records, electronic prescriptions and connection to diagnostic information systems and communication with citizens. Also, feedback from all stakeholders is very important to improve the performance and ease of implementation of the virtual visit program. Therefore, considering the extent of virtual visits as well as the signs of its acceptance and feasibility in this field, it is necessary to consider the experiences, challenges, and obstacles of implementation. This information allows administrators to use virtual visits as a tool to improve healthcare delivery, depending on the conditions and needs. This research on the applications of virtual visit technology in the provision of primary healthcare can be used as an

effective tool in policy making and decision-making by health managers in critical situations. This action may facilitate the path of the health system towards achieving the goals and improve the health of the society.

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AUTHOR'S CONTRIBUTION

EJ and LK collected and analyzed the data with help and supervision from PA; PA, LK, and KB wrote the first draft of the manuscript, which was further developed in consultation with all authors. All authors contributed to the study's conception and design and read and approved the final manuscript. AM is the article's guarantor.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding the publication of this study.

FINANCIAL DISCLOSURE

No financial interests related to the material of this manuscript have been declared.

ETHICS APPROVAL

The study was approved by the ethics committee of Kermanshah University of medical sciences (code: IR.KUMS.MED.REC.1401.214).

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