

A Survey of Iranian Physician Vision about Telemedicine and its Potential Use in Medical Practice

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Abstract: Telemedicine is new method for better diagnosis and treatment. The triangulation study was conducted in order to Survey of Iranian Physician's view about Telemedicine and its Potential use in Medical Practice. The descriptive_ analysis study was done in two main phases. First, various aspects of telemedicine were evaluated and identified by 22 experts on Delphi method and was designed a questionnaire. After its validity and reliability were confirmed (%87). 235 physicians completed questionnaire. The data were analyzed by spss software. Findings showed that treating physicians would have fully agreed about the aspects of running time of treatment and care and costs and economic problems. However, their views were negative with the rules and confidentiality of information and physician – patient relationship. It is recommended that authorities establish the appropriate infrastructures to launch this system and hold appropriate training for users in order to making optimum use of the system.

Key words: Telemedicine • Application • Physician Vision • Delphi method • Cross - Sectional study
• Medical Practice.

INTRODUCTION

Clinical telemedicine enables the provision of specialist medical consultations to patients living in distant places and their primary care providers [1]. Furthermore, telemedicine reduces travel, saves time and addresses the challenges faced by patients with diseases that require regular follow-up and monitoring such as hypertension and diabetes [2,3]. Additional advantages of telemedicine include the reduction of medical errors by doctors and nurses, increased quality of education and training for doctors and medical personnel, increased capabilities for faster growth of medical knowledge and clinical care for diagnosis and treatment and the increased use of executive services and home care. A review of studies indexed in Pub Med and Medline indicate that telemedicine is widely used developed countries [4-6]. However, the status of telemedicine applications differs among developing countries. While telemeters can dramatically improve upon traditional methods of medical treatment, several

physicians and healthcare providers continue using traditional systems such as telephone and/or pen and paper procedures [7]. Durrani and Khoja conducted a systematic review of the literature on tele-health in Asia. They found that most tele-health applications were based on the store-and-forward modality (43%), with 35% using videoconferencing and 15% using a hybrid approach; about 20% of telehealth applications indicated improved access to health care [8]. In Iran, Haghighi *et al.* (2011) reviewed the possibility of using telemedicine in Hormozgan. From a sample of 141 specialists, they found that 85.5% of these specialists indicated that consultation and 71.6% indicated education, was the best use of telemedicine technology. The specialists indicated that the lack of technical staff (68.8% of the respondents) and high initial costs (66.7% of the respondents) were the main barriers for implementing telemedicine [9]. Despite the benefits of increased access to quality care improvement and cost controls, telemedicine is not easily implemented. There are multiple challenges and barriers that hospitals face when attempting to integrate

telemedicine techniques. Telemedicine has been used sparingly due to past habits, laws, issues with insurance reimbursement and problems with support organizations [3, 7]. Most studies have only reviewed one aspect of the utilization of telemedicine such as rules or costs. In contrast, we examined all aspects of the application of telemedicine and we evaluated its efficacy. Thus, the purpose of the current study was to survey a group of Iranian physicians and determine their thoughts on the potential use of telemedicine in their medical practice.

MATERIALS AND METHODS

This descriptive analytical study was carried in two main phases during the period 2009–2011. The Delphi technique as outlined by Pfeiffer (1968) [10] was utilized during phase one. We selected Delphi panelists from a list of health informatics experts, physicians and IT experts who have worked in the field of telemedicine in medical colleges. 15 eligible experts (faculty members) from Tarbiat Modares University, Ahvaz Shahid Chamran University and Ahvaz Jondishapour Medical Science University volunteered to participate in this study.

During focus group sessions, the participants discussed topics such as the cost-effectiveness of telemedicine, as a diagnostic, therapeutic and/or case management tool. Over three sessions, the participants agreed on the most important factors related to the application of telemedicine, partially functional factors were removed.

Each topic was categorized and a final set of topics was extracted. In the second phase of the study, participants received a questionnaire containing the finalized set of topics from the first phase. Deputies dealing with telemedicine and e-health were asked to rate the topics on a scale from 1 (*least important*) to 10 (*most important*). The topics were identified and prioritized based on their average ratings. Next, the priorities were discussed by experts and refined again. This provided content for a subsequent questionnaire. Participants were asked to rate items on this new questionnaire on a scale from 1 to 10. This new information was again analyzed and responses converged into a consensus. A questionnaire based on expert consensus was developed to investigate the use of telemedicine as a reliable tool for daily practice. Final research priorities from the first phase were determined by a focus group including faculty members of medical science and IT departments. This focus group differed from the Delphi group; the researcher directed the new

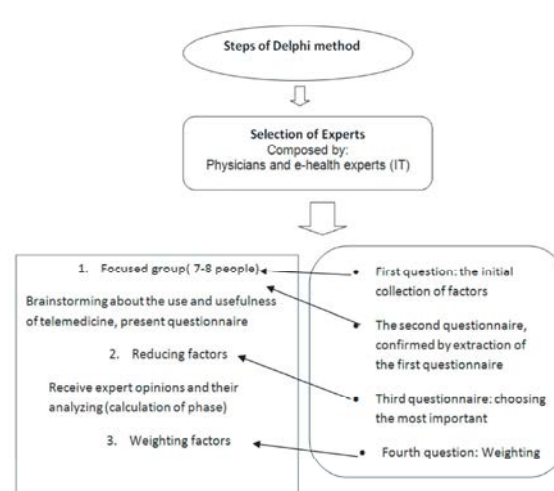


Fig. 1: Diagram1 showed steps of Delphi method

focus group session. This approach allowed the researcher to explain and interpret the data while elaborating on the dominant themes of the participants experiences [11]. This collaboration proceeded final phase procedure used in the current study is shown in Fig 1.

A cross-sectional descriptive study was conducted during the second phase. A telemedicine application questionnaire was created and its responses were divided into levels of agreement (unanimity, consensus, majority and disagreement). Questionnaires were sent by mail and 235 Iranian physicians with various specialties within university hospitals completed and returned the questionnaire. We first did a scale reliability test of the survey instrument. We used the Cronbach alpha to test the reliability of the questions (0.87). We then did two regression analyses to identify the relative importance of the factors in intention to use the technology.

Data analysis was conducted with SPSS version 17. We compiled the frequencies of specific answers on nominal scales and calculated means and standard deviations for cases on continuous scales. Coefficients of variance were calculated to measure the stability of the Delphi survey. This study complied with local health service requirements and research ethics principles of the World Medical Association Declaration of Helsinki

RESULTS

The results for the current study are reported in two parts 1) the results of the Delphi survey and 2) the results of the cross sectional study. The first questionnaire analyzed and 76 themes were detected. After summing up and integrating similar themes, 32 themes were defined

Table 1: Main category and subcategory

Factors	Agree/ Disagree-%
Patient –doctor Relation	
Demand for opportunities to discuss the doctor- patient	70/30
Psychological aspects of the doctor-patient relationship (developing empathic relationships)	65/35
Costs- economic problem	
Reduce treatment costs	75/25
Reduce visit costs- Consultation	85/15
Travel costs 80/20	
Cost of infrastructure	70/30
Start-up costs 80/20	
Cost of Education	70/30
Outcome treatment	
Easy access to physician	90/10
Reduce the need for frequent hospitalization for Screening	70/30
Accuracy of diagnosis	
Consulting with the each other Specialists	90/10
The patient consulting with the a few specialists simultaneously	85/15
Simultaneous evaluation of the patient's health by care team	75/25
Confidentiality of patient information	
Person access to their health data	65/35
Access to data for all organizations including law Ownership of data	80/20
Transferred of data outside the country	87/13
Fine disclosure and destroyed of electronic records	92/8

Table 2: Demographic data of physician survey

Item		Total
Age (year)	N	235
	Mean \pm SD	45.3 \pm 7.21
Sex	N	235
	Male%	68.2
	Female%	28.3
Medical area	N	235
	Cardiologist%	0.9
	Radiologist%	0.12
	Pediatrician%	0.8
	internal Medicine%	0.16
	hematologist%	0.7
	Endocrinologist%	0.5
	Orthopedic	0.8
	General physician%	0.38
Year of medical practice	N	235
	Mean \pm SD	17.4 \pm 5.37

and considered as aspects of telemedicine. Themes were refined and categorized based on medical application and specific factors were weighted. Finally, data analysis revealed 5 main themes and 19 subcategories related to aspects of telemedicine patient-physician relationships, costs and economic problems, diagnostic accuracy, duration of treatment and confidentiality of patient information (Legal and Social Issues).

Results of the second phase indicated that the majority of questionnaires were completed by male physicians (%68.2); %28.3 were completed by female physicians. The average age of respondents was 45.3

years and they had approximately 17 years of medical practice on an average. The majority of physicians were general practitioners (%38); %16 worked in internal medicine (Table 1).

Table 2 shows the details of the responses to the telemedicine application factors. Responses were divided into agree/disagree categories. Respondents agreed to use telemedicine in the treatment and care of patients because telemedicine provides opportunities for discussion between patients and doctors (%70 agreed). Further, %85 agreed that telemedicine reduces visit costs (Consultation).

The highest level of agreement was for subcategories dealing with easy access to physicians and consultation with other specialists (%90 agreed), as well as the accuracy of diagnosis disclosure and destruction of electronic records (%92 agreed). However, %77.6 of the physicians believed that telemedicine could have negative effects on the doctor-patient relationship. Physicians' views about the costs and economic problems associated with telemedicine indicate that % 61 had positive attitudes about the use of telemedicine and, 38.8% had a negative attitude about the impact of telemedicine on cost reduction. In addition %58.2 of the respondents had a positive attitude regarding diagnostic accuracy in the telemedicine system and %73.1 had a positive attitude regarding treatment duration. Moreover, %69.2 had positive views regarding laws, privacy and medical ethics, %30.8 had negative views about the possibility of privacy for patient care through telemedicine. The majority of respondents reported normal or slightly high informatics skills. Although %56.4 reported using the Internet at work, %43.5 reported using the Internet at home at least 1 hour a day. Knowledge of telemedicine was, with %9.2 having never participated in a telemedicine project. Respondents found real-time transference of images, clinical sessions, surgical operations and videoconference training to be the most interesting current applications of telemedicine. The respondents believed that telemedicine would be of maximum benefit in specialties such as cardiology, general medicine, pediatrics and emergency services.

DISCUSSION

The results of the current study demonstrated a considerable increase in physicians, use of informatics and e-health. However, several physicians are not yet able to provide telemedicine services due to a lack of adequate technology. During the last few years, research and

development of a telemedicine network has increased significantly in Spain; at present there are telemedicine programs in regions across Spain [12, 13].

Most of our respondents were either young or middle-aged adults. Therefore, our sample was likely more willing to use new technology. Our sample age composition is similar to that in a study by Segura (age: mean \pm SD 46.74 \pm 7.15); [7]. Additionally, our sample included specialist users of medical technology who used the Internet for clinical applications. These results are consistent with those of Vrkey *et al.* (2008), who examined the use of telemedicine for improving access to care at a work-site clinic [6]. Thus, once health authorities implement telemedicine programs and provide medical computer tools, physicians should be able to easily adapt to these new technologies [14].

An important issue in the present study was that physicians valued specific aspects of telemedicine. Respondents were interested in telemedicine applications that were directly related to their individual training and clinical practice. Administrative challenges with telemedicine were also documented. Coordinating consultations between primary care physicians, subspecialty physicians and patients is particularly challenging. Difficulty with identifying appropriate clinical partners to provide telemedicine services to patients deters several providers from adopting this technology in their own practices [15]. A particular concern is the usefulness of telemedicine in the patient-physician relationship [16]. As Whitten, Sypher and Patterson (2000) have discussed, "We know a good deal about bandwidths and resolutions, but little about the human dimensions that make practice possible.P:124" [17]. Studies on the effect of telemedicine on doctor - patient communication demonstrated some agreement and disagreement. For example, Miller (2001) and Wootton (2004) have stated, "Verbal content analysis is important for the development of interventions aimed at facilitating doctor-patient telecommunication" [18,19]. Some clinicians are of the opinion that telemedicine visits are similar to face-to-face visits [6,7]. However, our results suggest that doctors have a negative view of telemedicine with regard to privacy issues.

One concern of the physicians in our sample was related to patient care privacy policies. The majority of respondents were doubtful about aspects of patient privacy. Frazandipoor *et al.* (2008) designed a model for information confidentiality and they stressed that such confidentiality is manageable [20]. A comparative study of Australia, Canada and England advised care providers

to obtain electronic consent from the patient [21-23]. Whitten (2004) attributed doctors' resistance to the use of this technology to the fact that it cannot permanently retain a patient's medical information [24]. Ousignant, *et al* (2011) studied patients' satisfaction with a tele-rehabilitation alternative as compared with standard face-to-face treatment. They found that patient's satisfaction was high for both the tele- rehabilitation itself and the technological platform used for tele- rehabilitation [16]. The present results show that the use of telemedicine can be a benefit in terms of cost efficiency, diagnostic accuracy and treatment duration. To our knowledge, no published studies on several critical care applications using current technology and evaluative techniques in Iran address this issue. In a systematic review, Roine, Ohinmaa and Hailey found that there is little data on the general and cost effectiveness of telemedicine. Most of the 1,000 articles surveyed were reports on the feasibility of various applications and only a few studies reported a controlled comparison of a telemedicine application with a conventional means of providing services [25]. Several studies have performed a cost-benefit analysis of a telemedicine system. These studies report that the most obvious savings associated with telecommunications (lower travel expenses, less time taken from work, etc.) are not currently included when assessing general health care costs. Thus, increasing access to care through telecommunications might actually have a paradoxical effect of increasing direct medical expenditures while monetary savings accumulate within other segments of the economy [26, 27]. Although contradictory results are reported with regard to the aspects of the use of telemedicine, the physicians in our study expressed a strong interest in online training, distance control of chronic diseases, online communication and real-time transmission of images and information among specialists. Such results are consistent with those other studies [6, 7]. Startup support from the federal government has encouraged the development of new telemedicine programs. It seems likely that physicians and medical students will increasingly expect opportunities to learn about new technologies given the inevitable advent of these programs as they commence professional practice.

CONCLUSION

Despite the impressive growth of clinical telemedicine over the last six to seven years, the remarkable differences between current and future expectations held by physicians pave the way for future telemedicine projects.

Some physicians are skeptical about the use of telemedicine, especially with regard to physician–patient relationships. Telemedicine plagued by challenges related to limited reimbursement, complex telecommunication services, requirements for new practice patterns, the ephemeral and ever-shifting nature of health partnerships and the high fixed costs of building a hospital network, will need widespread endorsement by the medical community, hospital administrators and the federal government.

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