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ORIGINAL PAPER

Survey Determinant Factors of Telemedicine Strategic Planning from the Managers and Experts Perspective in the Health Department, Isfahan University of Medical Sciences

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ABSTRACT

Introduction: Awareness of Outlook, objectives, benefits and impact of telemedicine technology that can promote services quality, reduce costs, increase access to Specialized and subspecialty services, and immediately guide the health system subconsciously to the introduction greater use of technology. Therefore, the aim of this study was to determine the strengths, weaknesses, opportunities and threats in the telemedicine strategic planning from the managers and experts perspective in the health department, Isfahan University of Medical Sciences, in order to take a step towards facilitating strategic planning and approaching the equity aim in health in the province. **Method:** This is a descriptive-analytical study, that data collection was done cross-sectional. The study population was composed of all managers and certified experts at the health department in Isfahan university of Medical Sciences. The sample size was 60 patients according to inclusion criteria. Information was collected by interview method. Researcher attempted to use the structured and specific questionnaire Then were investigated the viewpoints of experts and managers about determinative factors (strengths, weaknesses, opportunities and threats) in the strategic planning telemedicine. Data were analyzed using descriptive statistics (frequency, mean) and software SPSS 19. **Results:** Data analysis showed that change management (100%) and continuity of supply of credit (79/3%) were weakness point within the organization and strengths of the program were, identity and health telemedicine programs (100%), goals and aspirations of the current directors of the organization and its compliance with the goals of telemedicine (100%), human resources interested using computers in daily activities in peripheral levels (93/1%). Also organization in the field of IT professionals, had opportunities, and repayment specialist's rights by insurance organizations is a threat for it. **Conclusions:** According to the strengths, weaknesses, opportunities and threats points determined by managers and experts, and compare it with success and failure factors, which are defined by different researchers, it seems will be fail to implement of telemedicine in the province at present. But according to the strengths identified by managers and experts, there are a lot of potential for telemedicine in the province, and may be used, in relation to telemedicine projects, with a 3 or 5 year strategic plan, and taking steps to get closer to the equity aim in health.

Key words: the strengths and weaknesses, opportunities and threats, telemedicine, Isfahan University of Medical Sciences.

1. INTRODUCTION

In recent times, improving the level of healthcare is one of the main aims in every society. Governments have put considerable inputs, in terms of finance, policy, etc, into efforts to increase the level of healthcare, in both developed countries and developing countries (1).

Associated with the quick development of science and technology, healthcare has been also rapidly developing, not only in terms of the content of healthcare services, but also in terms of the channels through which the healthcare services are provided. As a consequence of new technologies, the benefits of health service delivery have been promoted using advanced technology for decades (2). Healthcare services and other healthcare relevant activities have constituted a new aspect from traditional healthcare. This is often referred as telemedicine. The strengths of telemedicine are the capacity to provide access to healthcare services, previously unavail-

able (3), or rapidly developing application of clinical medicine where medical information is transferred via telephone, the internet or other networks for the targets of consulting, and sometimes far medical procedures and examinations. This technology has significantly effect in developing countries where there are chronic shortcoming of medical personnel (4, 5).

Studies by researchers in different parts of the world showed some of the determinant factors (strengths, weaknesses, opportunities and threats) are similar to the telemedicine strategic planning in different countries and regions, and also some of them are various. While, many developing countries are still unable to fund and sustain meaningful telemedicine projects (6, 7, 8). Particularly in Iran, most of telemedicine projects confront common problems and challenges that affect their sustainability in terms of the technical, financial, and human resources aspects. Unfortunately, there are not

enough studies on telemedicine in Iran describing the information about strategic planning, threats, opportunity points and other aspects of telemedicine. All literature reviews surveyed only the general overview of the described telemedicine projects, pilots and feasibility of telemedicine (9, 10)

Managers and experts can have important role in successful implementation of telemedicine in health system. They have broad and comprehensive view towards the subject and their comments can be effective in determining the strengths, weaknesses, opportunities and threats of the organization.

In the meantime, the Isfahan province is one of the biggest province of the country with four million five hundred thousand population which is 30% of the population live in rural areas. Therefore, problems such as the size of the province, far from the cities and villages and places certain technical services and distribution of high population, are the issues and problems that have created disparities in access to health care for specific groups particularly rural groups. Given that, Internal and external environments of organizations and strategic planning factors are different, should be paid to monitor and analyze environment, views of knowledgeable individuals about determinant factors and finally categories and collects their comments in this subject. Therefore, the aim of this study was to determine the strengths, weaknesses, opportunities and threats in the strategic planning telemedicine from the perspective of executives and experts in the health department, Isfahan University of Medical Sciences, in order to take a step towards facilitating strategic planning and approaching the equity aim in health at the Isfahan province.

2. METHOD

This is a descriptive-analytical study, that data collection was done cross-sectional. In this study, data were collected in two section with refer to study samples. The study population consisted of all managers and professionals working in the Health Department of Isfahan University of Medical Sciences (120 person), which was chosen among them managers and experts. In the first step, the inclusion criteria was all person who had manager post, bachelor's degree and more than 20 year work experience, individuals with a master's or doctorate degree and more than 15 years of work experience. Base on these criteria, sample size was obtained 60 people. A data collection tool was interview. Researcher attempted to use the structured and specific question then were investigated the viewpoints of experts and managers about determinative factors (strengths, weaknesses, opportunities and threats points) in the telemedicine strategic planning. At first, interviewer read each question and when that person became sure truly understood question concept then was recorded their opinion. The question included items that were known in other researches as problems in implementing of telemedicine projects or was mentioned as factors in the success or failure of this technology in different countries. After reviewing the literature (11-13), researcher isolated the determinant major factors in the telemedicine strategic planning in other countries and tried to build a native of these things and then grouping them to be classified in the following 9 categories. 5 categorized related to internal factors (strengths and weaknesses points) and 4 class related to external factor (opportunities and threats points). In this study Isfahan uni-

versity of Medical Sciences and its subsidiaries was considered as internal environment and other organization and non-dependent parts to this University as external environment. In this research, the scores given to determinant factors were considered based on the number 5. Grades 1 and 2 as "low" strengths, weaknesses, opportunities and threats points, score 3 as "medium" and the scores 4 and 5 as "high" have been considered.

Data were analyzed using with SPSS 19 software and descriptive statistics (frequency, mean) were used.

3. FINDINGS

In this study, involved 60 healthcare experts and managers of Isfahan university of Medical Sciences which including 21 men (35%) and 39 women (65%). The results and comments summary of experts and managers about the internal factors (strengths and weaknesses of the organization) are shown in Table 1. On the strengths and weaknesses part, five factors were involved: internal human resources, internal management, institutional compliance, budget and credit and programs nature. According to Table 1, professionals and managers viewpoint in different dimensions in the field of human resources showed that, exception of the item "implementation by Level 2", there is strength in other items and the strength is the intermediate level. Internal organization management factors have been demonstrated that experts and manager had very negative views on management changes, and it identified a complete weakness in the implementation of telemedicine program. On the other hand, sample comments about two other items were indicated that they have a positive view about the goals, manager aspirations and their acceptance and support of such this programs.

So that, persons has been believed that goals and current management trends (100 %), admission and support of management (82.3%) factor were part of strengths point in the middle level. In the dimension of "organizational compliance" was the greatest weakness in the "accept changes in service providers," that including doctors, technicians and health workers. This weakness has been at a low level. At trust in technology dimension, that related to doctors, technicians and health workers trust in the use of technology organization has strong point in the intermediate class.

Budget and credit factor analysis also showed that the most frequency response of samples is average weakness, and the both surveyed dimension in this factor, there is a weakness in the organization.

Positive views of experts on telemedicine programs nature and current programs in health systems and their role as determinants factor of telemedicine strategic planning, which implies that they believe there is strength point in this agent for the planning and execution of telemedicine projects.

Table 2 indicated the results of research and summarizing expert opinions about the external factors (opportunities and threats organization). Opportunities and threats were examined in the four sectors, including infrastructure and human resources outside the organization, the provincial administration, social acceptance and provincial credits. The data in Table 2 demonstrated that from samples view in different dimension of "infrastructure and human resources" factor which has been surveyed telecommunications infrastruc-

Internal factors	Various Dimensions	Strengths (percent)				Weakness (percent)			
		low	intermediate	high	sum	low	intermediate	high	sum
Human resources	Planning at Level 3	13.8	51.7	10.3	75.8	10.3	13.8	-	24.1
	Run by Level 2	17.3	20.7	10.3	48.3	6.9	41.4	3.4	51.7
	Supervised and supported by Level 3	17.2	20.7	13.8	51.7	6.9	34.5	6.9	48.3
	Familiar with basic computer skills	-	72.4	6.9	79.3	13.8	6.9	-	20.7
	Interested in working with computers in daily activities	-	65.5	27.6	93.1	6.9	-	-	6.9
Internal management	Management changes	-	-	—	0	10.3	55.2	34.5	100
	Goals and desires of managers	31	65.5	3.4	100	-	-	-	0
	Acceptance of management support	27.6	55.2	-	82.8	6.9	10.3	-	17.2
Organizational Compliance	Acceptance of change in service providers	27.6	13.8	-	41.1	41.4	17.2	-	58.6
	Trust in Technology	24.1	65.5	-	89.6	10.3	-	-	10.3
Budget, Credit	Supply And Continued Credits	17.2	3.4	-	20.6	27.6	48.3	3.4	79.3
	Credits required for Initial projects (training and consulting)	20.7	13.8	-	34.5	27.6	37.9	-	65.5
Nature of program	Health programs	-	86.2	13.8	100	-	-	-	0
	Telemedicine Program	6.9	93.1	-	100	-	-	-	0
	Increase technical knowledge of physicians	3.4	93.1	3.4	100	-	-	-	0
	Reduce costs and increase Organizational revenues	20.7	65.5	-	86.2	13.8	-	-	13.8

Table 1. Classification viewpoints of experts and managements on internal factors (strengths and weaknesses of the organization)

ture, specialists in medicine and technology in different areas of province, had opportunity and this opportunity is in intermediate level. In addition, Table 2 also shows the experts' opinions in the case of the "provincial management", which rights experts reimbursement by insurance organizations has been problem, and this is as threats for organization. But about the other organizations manager's support of health plans has low opportunity.

In addition, professionals comments about provincial credits for health programs and government budget allocated to technology was suggested that in the government budgets dedicated to information technology, opportunity was in low level and in the part of provincial credits for health programs has low threat.

4. DISCUSSION

Telemedicine is the use of electronic technologies and telecommunications in the health and medicine field that has a significant role in reducing the costs of health care, and increasing the teamwork in health. This technology can serve an important role in solving the global challenges facing the health system, especially when considered as part of national health strategies. It also decreases the distance between the various strata and in terms of physical dimensions (space and time), eliminates the traditional structures and providing new services(14). Thus, according to the role of this technology in the health field, this study was conducted to determine the strengths, weaknesses, opportunities and threats points in telemedicine organization's strategic planning from administrators and experts' standpoint in health deputy of Isfahan University of medical sciences. According to the obtained results the weaknesses points of organization include following items:

- Management Changes
- Supply and continuity of credentials,
- Requirements credentials to implementation Initial projects such as training and remote consultation
- Acceptance of change in processes and service delivery manner by service providers and

- Needed human resources to implementation such projects in Level 2.

On the other hand, the following items have been identified as strengths points:

- Human resources familiar with basic computer skills.
- Human resources that has been interested to working with computer in daily activities
- Human resource for planning at level 3
- Human resources to oversee and support in Level 3
- Goals and trends managers
- Acceptance and support of managers within the organization
- Physicians, technicians and health workers (service providers) trust to technology
- Health programs and telemedicine projects nature

Also the threats points are as follows:

- Repayment professionals Rights by insurance organizations
- Technology acceptance by physicians (private sector)
- Technology acceptance by the people and their trust in technology for get services.
- Provincial credentials for health programs.

The following factors are the opportunities points:

- External organization Infrastructure and human resources, such as communication and telecommunication facilities in the province, the number of medical professionals and technology experts in different parts of the province.
- Supporting managers of other organizations of health programs
- The impact of telemedicine program to increase people satisfaction for access to services.
- Information technology government budget that dedicated to organizations in the current year.

In line with obtained results in order to determine the strengths, weaknesses, opportunities and threats points of organization, Moffatt JJ and Eley DS have studied the telemedicine programs barriers in Australia. The primary barriers identified were: funding; time; infrastructure; equipment; skills; and preference for the traditional approach. While

External factor	Different dimensions	opportunities				threats			
		low	intermediate	high	sum	low	intermediate	high	sum
Infrastructure and human resources of outside the organization	Communication and telecommunication facilities	34.5	48.3	-	82.8	6.9	10.3	-	17.2
	Specialists in Medicine	34.5	44.8	3.4	82.7	10.3	6.9	-	17.2
	Specialists in Technology	34.5	65.5	-	100	-	-	-	0
Provincial Management	Reimbursement of professionals Rights by insurance	20.7	13.8	3.4	38	44.8	17.2	-	62
	managers supporting of other organizations health programs	69	17.2	-	86.2	13.8	-	-	13.8
Social acceptance	Acceptance and trust of the people	44.8	-	-	44.8	37.9	17.2	-	55.1
	Compliance and vision of specialist physicians	34.5	3.4	-	37.9	31	31	-	62
	People Satisfaction	27.6	69	3.4	100	-	-	-	0
Provincial Credit	Government budgets of information technology	51.7	24.1	-	75.8	20.7	3.4	-	24.1
	Health Credit	13.6	24.1	10.3	48	34.5	17.5	-	52

Table 2. Categories of managers and experts on various aspects of external factors (opportunities and threats of organization)

funding is a well-known barrier to the up-take of telemedicine, the extra time needed for a telemedicine consultation has particular implications for the workload of rustic physicians. Although lack of equipment skills was identified as a barrier. A preference for a traditional approach can reflect a lack of difficulty acquiring this skill set or interest in learning computer skills (15). Therefore to address the infrastructure and funding issues, changes need to occur in health and rural policy and funding priorities. Although the training needs of doctors already take substantial attention the findings of this study propose that an increased focus on common skills, such as computer skills, in addition to clinical skills would be a worthwhile finance.

In another study in Egypt that has been provided an overall road map for telemedicine in this country, Khalifa and Hussein identified four trends in telemedicine state in terms of governmental, financial, technological, and medical perspectives in 2020. The major findings of this research pointed to the fact that telemedicine will be part of the national e-health, but it is not functional yet, that some of reasons for this are: resistance to change, absence of a business model for telemedicine, the lack of suitable infrastructure and technology (7).

Michael Gill says in his study: The question around telehealth is not whether, but how and at what pace". Telehealth is not a single, uniform type of technology; rather it is a aimed approach convenient to the individual's needs, combining process, organizational and responsibility changes supported by monitoring and collaboration technologies. It needs: clinical leadership, policy alignment, abandonment of the pilot approach, change management. They confirmed the fact that telehealth itself is less of a technical issue than it is a clinical workflow issue, especially in primary care environments. The current discussion often focuses on the rural-to-urban use of telehealth. They investigated that is less importance than the application of telehealth to break down the divide between general practitioners, allied health, specialists and the acute sector. Telehealth is basically about increasing team based care, collaboration and patient access (16).

Hu and colleagues in their study used Theory of Planned Behavior to investigate technology acceptance by doctors who practiced in public tertiary hospitals in Hong Kong. Their findings demonstrated that technology acceptance by physician was in moderate level. Overall physician have positive attitude towards the use of telemedicine for clinical work.

Also information source and creditability and perceived behavioral control are important factor for acceptance of telemedicine in this society (17).

James Bush says, the deployment of telecommunications lines, equipment and financial support is the first problem. He says that a sufficient supply of investment is a significant challenge. He also argues that the primary risk in the first and second year (of five years) is the financial and operational sustainability of the project. Operational sustainability depend on participation by healthcare providers and acceptance of telehealth services by the patients (18).

In another study, Davar surveyed the Tele-Health delivery models in India. In this study, main obstacles to adoption of telemedicine have been included: cost constraints, absence of standardized technology platforms, and lack of resources for reciprocal learning and swap of knowledge in most healthcare organizations, unavailability of a best-practices repository. Therefore for enhancing the acceptance of this technology in India was suggested that creation of standardized technology platforms, establishment of best-practices repository and knowledge-exchange platforms, enhancements to existing legal frameworks. In addition the relationship between public and private organizations is another easier solution to accept telemedicine technology, Public organizations, with their large scale and scope, could also help in creating collaboration opportunities and knowledge-sharing. Private institutions can provide efficient management and state-of-the-art technology solutions to complete the physical infrastructure and reach of public healthcare institutions (19).

Rezayian in his study says that resistance to change is one of the reasons that would prevent the transformation strategy. He stated his reasons for resistance to change as follows: fear of the unknown, lack of confidence, fear of failure, loss of reputation or job security, coworkers' pressure, disruptive organizational culture, personality conflicts, lack of taste, propriety and poor timing (20). Alharthi in his study examined the status of telemedicine in eight countries, New Zealand, Australia, America, Canada, United Kingdom, Malaysia, China and India. Their finding showed that the eight studied countries have different healthcare background in terms of demographic features, economic and social development, and healthcare system even ethnic culture background. Also factors such as standardization, legislation and regulations, business modeling and program assessment, financial constraints

and specialized training for human resources in telemedicine, are effective in organizational success in development of telehealth (21). There are also some factors that could be facilitated telemedicine acceptance, such as age population, higher costs for health systems, large population, unlike health care coverage, unequal distribution of population, increasing population rate, low satisfaction in providing current care. Besides the aforementioned factors, the strategic plan is one of the most important factors in the development of telemedicine in the national and international levels (21).

According to the findings, the results show that strengths, weaknesses, opportunities and threats points in the organization were classified as internal factors and external factors. Although in many cases, the organization has strengths and opportunities, but the extraction weaknesses or threats points was identified to the organization are as same risk or lack of succeed factor for use of telemedicine, that were stated by the other researchers.

5. CONCLUSION

Due to factors in the success or failure of telemedicine programs indicates that related factors in failure or the lack of widespread use of telemedicine, are aligned with the organization's weaknesses and threats, such as lack of human resources required, the lack of necessary funds or lack of continued funding allocated to projects in telemedicine, problems related to social acceptance, new methods and technologies by service providers. So if in the current situation, the health department takes action in telemedicine projects, without pay attention to these factors and adopts appropriate strategies to decrease weakness and threat points and effective use of the strengths and opportunities points, will most likely encountered defeat. Without attention to these issues and to minimize weaknesses and threats and, would be a waste of time, effort and investment in health sector.

Also, according to the organization's strengths and opportunities, indicates that despite the shortcomings and weaknesses, in some cases, they can have a decisive role in the success of telemedicine projects. So in total, now isn't the perfect time for telemedicine projects in the province, but it is perfect for planning to implement telemedicine. Using a three or five-year strategic plan and the strengths and opportunities, can be eliminated weaknesses and threats, and provide health services with the help of information and communication technologies in the near future and use of its advantages in increasing access to services in all parts of the province and increase equity in health care delivery.

CONFLICT OF INTEREST: NONE DECLARED.

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