

# Usage of E-Health Services in Health Institutions and Opinions of Patients

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**Abstract—** E-Appointment, E-Family Practice, E-Information, E-Prescription, E-Pharmacy, Electronic Health Registration (E-Registration), Nursery Information System, E-Radiology, E-Laboratory, E-Smart Card, Tele-Medicine, Biometric Authentication System, are used within the E-Healthcare system in Turkey. Main objective of this research is to evaluate opinions of patients about E-healthcare services provided in healthcare institutions and utilization status of these services. The research is important in terms of understanding the E-healthcare using patients' views on the national usage of technology in healthcare in Turkey. The public survey consists of 19 questions and among them there are questions to measure the participants' sociodemographic status along with the ones to evaluate participants' awareness of E-Healthcare services and their satisfaction of these services.

**Keywords-** E-Healthcare; Patient Opinions; Hospital Information System; Healthcare Institutions; Healthcare Informatics in Turkey.

## I. INTRODUCTION

Nowadays, technology is one of the best ways to gather information. Storage of information, systematic arrangement, processing, transmission and accessibility are possible thanks to the existing technology [1]. In healthcare services, hospitals and healthcare institutions also use computers to interact with complicated environments in order to be effective [2] [3]. Quick developments in both healthcare and computer science sectors result in both of this sectors to be intertwined and to change drastically [4] [5].

According to the World Health Organization (WHO), Technology concept in terms of healthcare technology can greatly contribute to the solution of a medical problem, and including its users; is a combination of methods, technique and equipment [6]. E-Healthcare is defined as the usage of communication and information technologies in their full function to improve the health of individuals and the accessibility of healthcare services provided in forms of high quality, efficient and effective healthcare services [7]. Also, E-Healthcare is used for healthcare services that are supported by communication and information technologies [4] [8].

In this paper, patients' opinions about E-healthcare services and evaluation of usage status of these services in Turkey are the main objective of the research. In parallel with the main objective of the research within the extent of E-healthcare services concept, it is aimed to evaluate patients' opinions about services that are executed in healthcare institutions like Electronic Patient Registration (E-Registration), E-Prescription, E-Appointment System, Biometric Authentication, E-Radiology, Pharmacy, Laboratory, Surgery Room Information systems and their knowledge, opinions about Tele-medicine and also, usage status of the current services. The research is important in terms of understanding the E-healthcare using patients' views on the national usage of technology in healthcare in Turkey. The research was conducted between the dates of 1 of June 2013 and 31 of August-2013. Therefore, time can be boundary of this project.

In Section II, we give state of the art in E-Healthcare. In Section III, we introduce E-healthcare applications in Turkey. More details of historical development of the E-healthcare services in Turkey are described in Section IV. In Section V, we give methods of research. Results of the research are given in Section VI. Finally, we drew a conclusion and suggestions for future work in Section VII.

## II. STATE-OF-THE-ART IN E-HEALTHCARE

In the article "Acceptance of Swedish E-Health Services" which was written by Mary-Louise Jung and Karla Loria in Sweden, 12 old patients were interviewed in order to determine the attitude towards technology usage in healthcare sector [9]. The research contains only the inspection of services that are provided by public healthcare hosts in Sweden that provide online healthcare services, online doctor and e-prescription services. In order to collect data, interviews were conducted about the difficulty level of e-health systems and about the attitude towards each one of the services.

In the research that was conducted by Fatma Gül Altın in Turkey "Application of Information Technologies in The Healthcare Sector" doctors' opinions towards usage of e-health services were evaluated [10].

Opinions of the patients that use e-health services directly and the evaluation of these services' usage status are significantly important. There is no research about usage of e-health systems with patients in Turkey. Our work is the one and only in this perspective. In order to conduct the research, a large

focus group was considered (656 Patients). The evaluation of all the e-health services that are used in public and private sector is the main purpose of this research.

### III. E-HEALTHCARE APPLICATIONS IN TURKEY

By using E-Healthcare services, healthcare institutions' expenses will be lowered, thus their efficiency will be improved along with the efficiency of serving healthcare services and distribution of sources and the communication among healthcare staff. It will be easier to benefit from healthcare services for individuals who have problems such as accommodating in rural areas or having hardship with transportation. Individuals and healthcare staff will be able to reach information more easily thus time will be used much more efficiently [10] [11].

Services that are already in use in Turkey are E-Family Practice, E-Appointment, E-Information, E-Prescription, E-Pharmacy, E-Registration (Electronic Healthcare Registrations), Nursery Information Systems, E-Radiology, E-Laboratory, Tele medicine, Biometric Authentication Services [9].

Electronic Patient Registration is a storage, in which all the information about a patient is stored virtually, to be used when needed [12] [13].

Family Practice is a computer program for the use of the family doctor on duty under the extent of "Family Doctor Implementation" and healthcare staff who works in the field of family healthcare [4] [14].

E-Appointment System is the scheduled acceptance of patients to the polyclinics through a set of pre-determined rules. Patients that are going to be examined are given a certain date. Scheduling is about using time and sources efficiently [15] [16].

Radiology, also known as Medical Visualization, creates, stores, processes, and saves images [17]. Visualization devices work through the use of computer technology and data process techniques and help doctors to reach proper diagnosis and to prepare disease diagnosis and a treatment plan [18].

E-Prescription provides digital input, storage, and transmission of prescription information electronically among institutions. The era of writing prescription on paper has come to an end due to switching to the E-Prescription System. With the system, doctors write prescriptions on digital environment and pharmacists can see which doctor prescribed which medicines online. Being supported simultaneously by smart card, this system ended health certificates and referral notes, thus all transactions passed upon digital environment [19].

Nursing Informatics System contains systems on which information and communication systems focuses on procedures and fields about nursery. The system makes information process and management easier [5] [12].

Telemedicine provides distant patient treatment services with the help of technology [20].

E-Information Services is one of the services that the Ministry of Health delivers. With this procedure, service can be received via double sided, sound-video transmitting, interactive screen located in the patient's house which provides communication between healthcare staff and the patient.

Biometric Authentication has been developed to identify individuals by recognizing their physical and behavioral characteristics features [21]. The most important feature of biometric systems is developing personal features. These features provide such security that it cannot be transferred to another individual.

### IV. HISTORICAL DEVELOPMENT OF THE E-HEALTHCARE SERVICES IN TURKEY

E-Healthcare service works has started with the projects of the Ministry of Health with the help of the World Bank in 1991 and the Healthcare Information Systems started in 1995. The studies in the field of healthcare information systems have been improved with the Ministry of Health Project in Healthcare Project (CHP) which started in 2003 to create a Health Information System (HIS) that covers every aspect of the healthcare sector. Studies for this are called E-Healthcare Project. Healthcare ministry undertook the coordination of E-Healthcare Work Group in the extent of "E-Transformation Turkey Project", created and executed a Schedule in 2006. It includes projects like E-healthcare Project, Central Hospital Appointment system (E-appointment), E-prescription, Electronic Referral system (E-referral), Family Practice, Electronic Identity Card, and Tele-Medicine. The Healthcare Informatics Congress from 2006 and the Healthcare Informatics Congress from 2007 were held to discuss this matter. "E-Healthcare System in Turkey Project" has been improved by holding E-Healthcare/Tele-Medicine Congress in the extent of Informatics Summit in 2008 [22] [23].

### V. METHODS

The research was conducted between the dates of 1 of June 2013 and 31 of August-2013 in Ankara Private Sanatorium Health Center. The basis of the research is created total 5000 patients who had applied to receive medical service. The sampling of the study consists of 656 patients.

The research is a descriptive, cross-sectional study. Data were gathered via public survey form. The public survey consists of 19 questions and among them, there are questions to measure participants' sociodemographic status along with the ones to evaluate participants' awareness of E-healthcare services, usage of services and satisfaction level of these services, opinions about E-healthcare services protecting participants' privacy, information sources about application of the services and problems occurred using the services.

The surveys were done in the waiting room while the patients were waiting for examination. They usually lasted about 5 minutes. Participation in the survey is completely voluntary. Likert Scale 5 Point is applied to the poll. During data analysis, analysis was done via combining the participants that gave the answers of “bad” and “very bad” with the ones gave the answers of “good” and “very good”. The data which had been gathered by poll results was analyzed via SPSS 18.0 package program.

VI. RESULTS

60.4% (n=396) of the patients are female, 39.6 % (n=260) are male. 30.6% (n=201) of the patients are elementary school graduates, 10.2% (n=67) are middle school, 28.7% (n=188) are high school graduates, 8.5 % (n=56) have two-year degree, 19.7% (n=129) have bachelor’s degree, 1.5% (n=10) have master’s degree, 0.8% (n=5) have doctorate. 74.7% (n=490) of the participants are married, 21.3% (n=140) are single, 0.9% (n=6) are divorced, 3% (n=20) are widower.

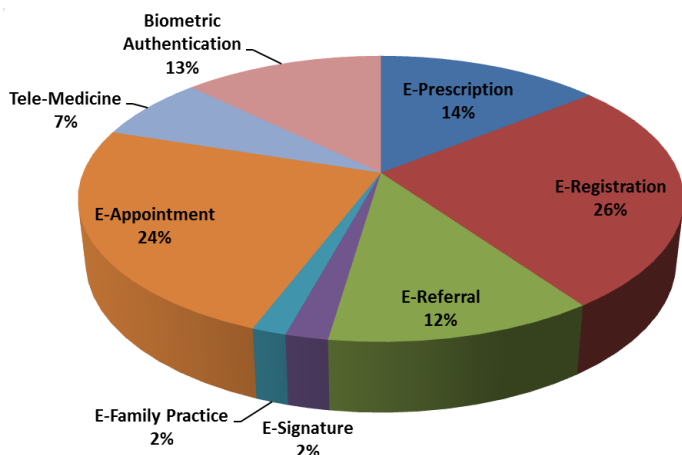


Figure 1. Participant’s Awareness Status Of The E-Healthcare Services E-Healthcare Application

It can be seen on the figure that the service patients are aware of most is E-Registration 26.0 %, with E-appointment following with the second highest ratio of 24.0 % (Figure 1).

While 51.8% (n=340) of the participants encountered problems about E-Healthcare procedures, 9.8% (n=64) of them did not. While 17.7% (n=116) of the participants pointed out that there has been no difference regarding services after E-Healthcare procedures took effect, 20.7% (n=136) of them have no idea about the matter.

TABLE I. SATISFACTION AND USAGE STATUS OF THE PARTICIPANT ABOUT E-PRESCRIPTION, E-APPOINTMENT AND E-REGISTRATION SERVICES

	Poor		Good		Excellent		No Usage	
	n	%	n	%	n	%	n	%
E-Prescription	41	6.2	42	6.4	257	39.2	316	48.2
E-Appointment	171	26.1	111	16.9	295	45.0	79	12.0
E-Registration	64	9.7	78	11.9	477	72.8	37	5.6

While 39.2% of the participants are satisfied with E-prescription services, satisfactory ratio of E-registration services is 72.8%. 26.1% of the participants are dissatisfied with E-appointment services (Table 1).

Among the patients who use the E-prescription system 40.1% pointed out that they think that the system is secure in terms of protecting personal privacy, 31.3% are indecisive, and 28.7% pointed out that the system is insecure in terms of protecting personal privacy. It is observed that 61.4% of the patients who participated in the research use E-registration system in registration before examination, 13.1% occasionally use it, and 25.5% of the patients do not use it. When it is analyzed that if electronic registration system makes procedures easier in the hospitals, according to the participants, 66.6% of them think the system makes it easier to benefit from medical services, while 14.3% thinks otherwise. According to the 10.7% of the participants, even with the help of E-registration system there is no difference, while 8.4% are indecisive.

TABLE II. SOURCES OF THE PROBLEMS IN E-HEALTHCARE SERVICE PROVISION ACCORDING TO THE PARTICIPANT

Sources Of The Problems*	n	%
Healthcare Staff	432	66.0
Software and Substructure Inadequacy	521	79.0
Lack of Information	499	76.0
Healthcare Policies	234	36.0

According to the participants, most of the problems about the E-healthcare services mostly occur because of software and substructure inadequacy 79.0% (Table 2).

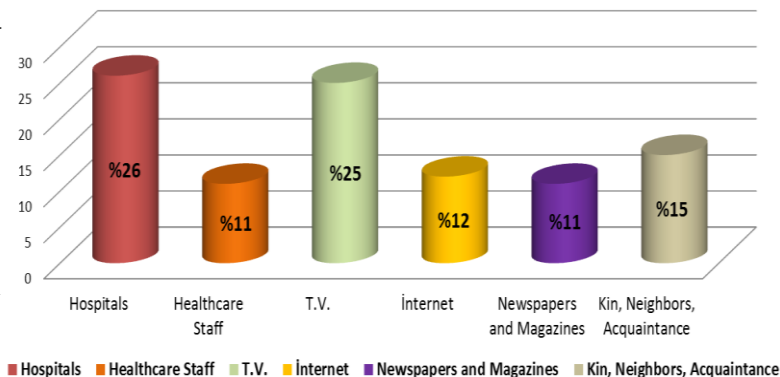


Figure 2. Information Sources Of The Participant About The E-Healthcare Practices

Hospitals (26.0%) and Television (25.0%) are at the top of the information sources which are for E-healthcare practices (Figure 2).

## VII. CONCLUSION AND FUTURE WORK

Healthcare sector is affected by the changes and innovations which are brought by technology. Each passing day new treatment methods and products become available. These days, intense usage of technology in healthcare sector makes the usage of E-healthcare services more important, and it is of great importance for serving these services more efficiently, more effectively and of higher quality. It is obvious that generating information, reaching information and using information with the help of technology has great importance to the healthcare institutions and to the individuals who want to make use of these institutions' services.

The main objective of this study is the evaluation of the services that are provided in healthcare institutions based on the patients' opinions. We also discuss the usage status of these services. We surveyed patients about their awareness of the E-healthcare services, usage ratio of the services, satisfaction level, problems about the services, information sources about the services, and problem sources of the patients.

In conclusion, these can be suggested:

- It is observed that with respect to telemedicine practices, healthcare information systems usage ratio is not enough. Because of this, hospitals should try improving R&D activities.
- Aspects like data transfer, data transfer security, adaptation convenience, access convenience, response time, determines E-healthcare services' quality. Improving these aspects will improve the satisfaction level and usage ratio of these services.
- Healthcare Ministry should raise awareness about the importance of informatics systems on general healthcare systems.

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