MILESTONE BEFORE/AFTER ANALYSIS OF TELEMEDICINE IMPLEMENTATION

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Abstract: This article is focused on description and evaluation of telemedical benefits for the users and participants in medical services, that work in conditions of telepracticing. It is dedicated to a newly introduced software solution for the purposes of distant medical consultation and diagnostic processes in Bulgaria that has been exploited for 6 months period and evaluated by 20 users in 2 hospitals.

Key words: Medical informatics, Telemedical Information System, Telemedicine, *e*-Health.

Introduction

The new healthcare area is a conjunction of doctors, hospitals, medical centers, financial experts, insurance experts in one virtual system, where the object, purpose, stock and instrument for healthcare management and politics is the information. It is the fundamental element that allows separate functional issues to interact.

Telemedical Information System (TIS) forms the basis for telemedicine and healthcare services and posses attributes like Hospital information system, Electronic patient record, picturearchiving and communication system and distant learning applications.

The purposes of TIS can be defined as:
➢ Registration of key information at the data source
➢ Ensures a platform for automatic processing of information
➢ Facilitates the data transmission
➢ Commits versions of evidence-based practical solutions
➢ Assures confidentiality of personal data
➢ Assists the patients to manage and control their own health

The main purpose of this paper is to propose and develop an analytical comparative table, that explores the period before implementation of a telemedical system and afterwards. We have examined the opinions of several user types – doctors and practitioners, emergency help participants, hospital managers, patients and their families. The parameters selection is combination between money expenses both for patients and hospitals, time expenditures for patients and doctors, data lost, healthcare opportunities and disease prevention. After introducing and experiment with the system for 4 months we have developed and give an opportunity to the hospital stuff to evaluate patient adoption of this new way of treatment, the hospital managers and the clinicians, that practiced with it. We have generally 69 questions, separated into 8 groups fro 7 patients, 18 doctors and 2 hospital managers. The results show that 4/5 from the questioned patients have positive attitude and don't feel embarrassment because of the missing face-to-face contact. On the other hand, the doctors point out the positive factors of this modern method of work, a conclusion that is verified by the answers – 90%.

Before	After
Transfer to the hospital	*Instant consultation*
Only one expert	*More experts*
Paper archive	*Digital Data base+ Paper archive*
Lost in transferring papers	*Digital record at 2 places*
More expenses for patients/relatives	*Least expenses for patients/relatives*
Multitude visits	*Reduction of visits*
Experts time expenses	*Only when necessary*
Healthcare in hospital	*Healthcare at home*
Isolation of experts	*Improvement of relationships in professional sphere*
Expenses of the hospital for:	*Only when necessary*
- specialists	*Only when necessary*
- transfers and ambulances	*Only when necessary*
- time	*Only when necessary*
- technology	*Single but with permanent reimbursement*
Lost of time for the patients	*Only when necessary*
Limited disease prevention	*Unlimited*
Patients access to specialists to the local place	*Patients access to specialists to a national level*
Need for personal direct contact with a specialist from national level	*Immediate distant consultation*
Limited free time for experts	*Augmentation of creative work*

We can describe and generalize the benefits of the telemedical process, exploring the point of view of each of the participants in it, as:

- ➢ Benefits according to the practicing doctors
    - o Fewer security risks for transfers and external consultation
    - o Shorter waiting times (or reduced delays) to see specialists
    - o Access to better quality specialists and to specialty care not previously available
    - o Fewer acts of inmate aggression, or use of force by guards, due to improved mental health services
    - o Fewer grievances about health care or mental health care.
    - o Advancements in delivery of services
    - o New facilities
    - o New models for clinical trials with distant participants
- ➢ Benefits according to the hospital manager
    - o new business perspectives
- ➢ Benefits according to the patients
    - o home health services
    - o no travelling
    - o no expenses for the family
    - o individual services
    - o new quality of life
    - o disease prevention

Through specialized information in TIS are joined technologies, methodic, legal issues, standards, that guarantee the working capacity of the system. By exploring studies of successful telemedical applications, we have described conditions operating during the process of implementation that are important for its outcome, *i.e.*, what are the characteristics of telemedical services that have been successfully implemented in routine clinical practice.

Standard medical practice		Telemedicine	
Pros	**Cons**	**Pros**	**Cons**
traditions of medical work - it changes with years and it is the main component of work methodics		simultaneous work of more organizations	equipment expencies
Tested through its development fixed and routine		standard simple process	knowledge for electronic data bases and PC literacy
The paper doesn`t require technologies	information lost	improvement of health services	new public way of work
face-to-face contact	financial and time expencies for patients family	care at any time, any point, anywhere, to anybody	problems with conviniece and reliability
Subjectice	mistakes	transfer of various data and examination results	acceptance from the personal to work with the system
Legislation and law have the evidence power and validates the doctor in front of every administrative and accounting issue	speculation with information	different diagnostic schemes and methods at the same time	requirements for more competencies in the specialty
Personal written responsibility - official documentation	time delay	consultations with more than one specialist	competiveness
Ancient rituals in communication with patient	old archives	homecare 24 hours	pressure of work
		long life and home education	who fixes the prices
		interaction human-PC	PC education
		objective opinions	ethical issues
		reduce professional isolation	political will
		reducement of permannet travelling and incresement of professional satisfaction	INSTITUTIONAL will
		ensuring the best specialists	cautiosness from patients
		new standards of work - faster, precise and cheaper	lack of legal issues
		team work principles	

Our findings and comparative analysis support the literature, which argues that telemedicine is an experimental and usually unnecessary development that only would affect the routine practice.

Based on the published experience we have developed a table, where are discussed positive factors and negative characteristics of both practicing models – standard medical and telemedical. Beyond doubt are the information lost, mistakes and time delay that could be performed in the course of applying standard medical procedures without involvement of computer system, and vice versa in telemedical practice, there is lack of political and institutional will, there are high requirements for good computer literacy and more competencies than standard.

Organizational difficulties are situated in the deep interrelationship of technical, social, legal and human aspects of implementing and adopting telemedical solutions. Conversely, success involves handling these complex, heterogeneous elements that are expressed in controversies and solved through social negotiation.

Conclusion

Telemedical applications introduced into routine practice are typically characterised by the following features: 1) telemedicine is seen as a benefit, 2) telemedicine is seen as a solution to political and medical issues, 3) telemedicine supports and performs collaboration between promoters and users, 4) issues regarding organizational and technological arrangements are successfully addressed, and 5) the future of this service is deeply discussed and considered.

More research efforts on the complex conditions that arise when technology is introduced should be encouraged. Last, but not least, a debate should be initiated in the professional medical community about this new feature, its evaluation criteria, methods of exploring the outcome results and exploitation opinions, that would speed up the introducing telemedicine in routine operation.

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