# The Role of Communication and Information Technology in the Health Care Providing Office

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**Abstract**

Health informatics technology includes the information technology and electronics employed during medical care procedures and is generally known as clinical informatics. The definition of this specialty was given by the American Medical Information Association in order to describe the role of communication systems in improving the doctor-patient relationship and the quality of medical care. The aim of our investigation was to evaluate the frequency of computer based methods use by medical personnel during daily basic activities in a private dental office. An original questionnaire was sent to a target group of 200 dentists with private dental practice from Mureș County, Romania, with an age between 30-55 years with a private practice opened for at least 2 years. For statistical analysis we used SPSS (Statistical Package for Social Science, version 10.1). The evaluation of results showed that dental software is considered by the majority of respondents to have an important role in improving the quality of medical act and elimination of time consuming procedures.

**Keywords:** Medical informatics, clinical care, dentistry, information systems

## Introduction

The science of medical informatics is considered to play an important role in medical research and health care. Communication and information technology represented by office web sites, computerized office management systems, e-mail communication, electronic oral health records improve

information for both doctors and patients. Communication and information technology was classified in the following groups of application: internet-based, clinical and administrative [Schleyer et al 2003, Ammenwerth et al 2003, Hayrinen et al 2008]. The first one refers to applications that can be accessed by a cellular phone, personal computer or other wire-less devices. The second group includes different devices and software programs such as the electronic health records that contain medical history, digital imaging, treatment planning and decision support applications. This is considered to be very important in providing essential information regarding social situation, preferences and values related to the medical care that is specific to each patient [Anderson et al 2006, Lium et al 2008, Andersen et al 2009 ]. In the same time, this technology might be used for a better communication with the medical staff by engaging the patients, through a collaborative manner, into conversations and including them in the decision process. The administrative applications include most of the aspects of computerized practice management system, that might have more effect on the patient`s experience with medical care as a whole. Registration, insurance claims processing, recall reminders or billing can positively affect the attitude towards the medical office policies and procedures [Westbrook et al 2007, Shengcai et al 2015].

The disadvantage of this new technology is that it affects the quality and quantity of health information and the doctor-patient relationship [Hollander et al 2001, Snyder et al 2015]. Some practitioners are frequently concerned about the medical information their patients received from the Internet, while others accept it and share links to preferred sources on their own Web sites. Applications that can be used in the medical office include online scheduling, e-mail messaging, pre-registration and pre-visit preparation or patient access to personal medical records.

Dental informatics was defined as the application of computer and information science to improve dental practice, research, education and management and specialists are looking for ways to use computers and new technologies in order to increase medical performance in the dental office [Hersh 2009, Johnson et al 2008, Masik 2012]. Their role is to create theoretical models, design and implement computer applications and evaluate different systems. The aim of our study was to determine the degree of application of computer based methods on daily basic activities of a private dental office. We will also investigate the relationship between clinician role, clinical task and selection of computer.

**Material and methods**

An original questionnaire was developed and sent to 200 dentists with private dental practice from Mureș County, Romania. The target group was defined as dental specialist with an age between 30-55 years with a private

practice opened for at least 2 years. All participants received the document by e-mail and were asked to send the filled form within two weeks. It consisted of 18 questions with 4 answer possibilities organized in 4 areas of interest, as follows: the first 4 questions were related to the personal opinion of the respondent about the role of informatics in medicine, the next 5 questions were focusing on the personal experience with the use of information technology in the private practice, the next 4 questions were about its` advantages and disadvantages and the impact on the patient and the last group of 5 questions were related to the role of computer information for a national survey program and research. For statistical analysis we used SPSS (Statistical Package for Social Science, version 10.1).

**Results**

At the end of the time interval we received 133 out of 200 questionnaires, meaning a response rate of 66.5%. A selection of the most interesting answers obtained from the 4 set of questions is presented below.

Question 1 - Nowadays, do you consider that the rapid development of informatics has an effect on dental medicine?

| Yes, mostly | Partially | Slightly | No |
|---|---|---|---|
| 63.16% | 27.82% | 8.27% | 0.75% |

Question 2 - Is there any informatics or informatics' systems involvement in your daily practice?

| Yes. mostly | Partially | Slightly | No |
|---|---|---|---|
| 31.58% | 43.61% | 21.81% | 3.00% |

Question 3 - Which of the following do you consider to be the most important advantage of informatics usage in dental practice?

| Ease of practice | Increase quality of medical act | Positive impact on the patient | Financial benefit |
|---|---|---|---|
| 42.85% | 32.0% | 14.0% | 12.0% |

Question 4 - Do you consider that the use of new generation technology has an important impact upon the patient?

| Yes, mostly | Partially | Slightly | No |
|---|---|---|---|
| 51.12% | 39.09% | 9.02% | 0.75% |

**Discussion**

The first use of health informatics was registered in the 1950s in United States when dental data were collected nation-wide. In the scientific literature only a few studies were based on the information needs of dental researchers. Strother, Lancaster and Gardiner, cited by Masic [2012] questioned 500 dentists and found out that the most needed information were related to the

new techniques used in dentistry, followed by information about practice management and medical complications.

The results of our investigation pointed out the interest of dental practitioners towards information technology as 63,16% considered that the development of computers has an important role in dental medicine, but only 43,61% use it frequently during their daily practice. Informatics is used mostly for the electronic evidence and patient records (37,83%) and dental office management (28.73%). The most important advantage is considered to be the ease of practice (42.85%) and increase in the quality of medical procedures (33%). The new generation of technology is considered by 51.12% of the respondents to have an important impact on the patient, increasing the confidence and improving the relationship with the medical staff.

The use of electronic dental records ensures patients that all personal documents and data are stored properly in one place, preventing the occurrence of errors. The software is technologically capable to store and display X-rays image, digital photographs, intra-oral pictures or videos. Using this new technology will increase patient comfort and allow safe and effective treatment [Lapinsky et al 2008, Lindquist et al 2008]. The function of speed and storage capacity of personal computers increased dramatically in the last decades and the availability of smaller instruments was a major advantage towards general practice computerization; simultaneously, the development of the internet had transformed the way medical information is created and disseminated [Chaitin et al 2003, Ross et al 2003]. Computers allow us to store enormous amount of information and, as they work as the human brain, proved to be extremely important in different fields of medicine; they can perform diagnostic tests in hospitals, as X-rays, computerized tomography, magnetic resonance imaging, scanning and many other methods to view the human body and deliver correct diagnosis.

The field of dental informatics is rather new but it demonstrated a great potential in improving dental research, education and patient care by addressing important issues such as creating devices that enable dentists to record patient information during clinical examination, gather information for different type of dental studies or developing software for dental education [Schleyer et al 2012]. The final goals of this creative work is represented also by creating virtual reality simulators that allow dental students to practice clinical skills or by developing automated systems in order to simplify dental office management.

## Conclusion

The majority of medics who answered consider that the development of informatics science has changed the concepts of modern dental health care by introducing new technologies in patients` records and treatment options.

Dental software has an important role in improving the quality of medical act and elimination of time consuming procedures. The electronic dental record is an important medical information system in a health care unit, including the dental office.

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