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EFFICIENCY OF APPLYING DIGITAL TECHNOLOGIES IN STOMATOLOGY

Safarova Nilufar Tashpulatovna
Tashkent State Medical University
Hospital Orthopedic Stomatology Department Assistant

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Abstract:

The article examines the effectiveness of applying digital technologies in dentistry, highlighting significant improvements in diagnostic accuracy, acceleration of treatment processes, and patient care personalization. SD scanning, digital radiography, CAD/CAM systems, and robotic surgical technologies are being considered. The article highlights the main challenges facing the industry: high starting costs, data confidentiality issues, and the need for personnel training.

Keywords: digital technologies, dentistry, SD scanning, robotic surgery, data privacy, personnel training, artificial intelligence, personalized treatment, medical innovation.

Digitalization is gradually penetrating all spheres of the medical industry, transforming the methods of diagnosis, treatment, and management of client data. Artificial intelligence, SD scanning, telemedicine, and electronic medical records enhance the accuracy, speed, and individualization of medical procedures. Such technologies benefit medical professionals and patients by setting high standards in providing care.

Dentistry is actively adapting high-tech solutions that have become a fundamental part of clinical practice, providing advanced tools for diagnosis and treatment planning. The introduction of digital equipment and corresponding software minimizes errors, increases the accuracy of procedures, and reduces the time required to manufacture prostheses and implants. The use of SD printing, CAD/CAM systems, radiography, and computed tomography makes dental services more accessible and affordable. [4]

The effectiveness of digital technologies in dentistry has a tangible impact on the quality of treatment, reducing its duration, and optimizing clinic resources. This allows for lower operating costs and improved satisfaction. Thus, digital development is becoming a fundamental element in the evolution of this medical specialization, opening up new opportunities for the development of private and public healthcare institutions.

Advanced IT solutions that improve diagnostics, treatment, and interaction with patients are widely used in dentistry. 3D scanning and digital radiography are among the primary tools that allow for detailed three-dimensional images of teeth and jaw structure. This method significantly simplifies the examination and contributes to more accurate therapy planning. Due to its high resolution and minimal radiation load, digital X-ray machines provide safety and comfort, surpassing traditional methods. [2]

CAD/CAM systems and virtual implantation have radically transformed clinical practice. CAD/CAM technologies provide the creation of computer models for precise manufacturing of prostheses and crowns, reducing the time and improving the quality of restorations. Interactive implantation provides an opportunity in advance.

design implant placement considering the patient's individual characteristics and minimizing potential risks. [1]

Teeth restoration has also significantly improved due to the introduction of 3D printing and automated ceramic production processes. These methods allow for the recreation of restorations that perfectly match natural teeth, making procedures more effective, convenient, and reducing patient waiting time.

R. Sh. Gvetadze notes that digital innovations accelerate procedures and reduce their cost. The precise and fast operation of the latest technologies reduces the time required to create dental prostheses, crowns, and bridges. This minimizes the need for frequent visits to clinics and the overall cost of dental services. Automation improves the use of materials and resources, reducing costs and increasing the profitability of clinics. [3] Managing patient information has become easier due to the implementation of electronic medical records and clinic management systems. Centralizing data simplifies their analysis, makes it easier to prescribe procedures and monitor therapy. As a result, the level of service improves, communication between healthcare workers and clients improves, and contributes to the more rational operation of medical institutions.

E.A. Tarasenko indicates the influence of digitalization on patient interaction and treatment individualization. Electronic medical records and management systems facilitate access to medical information, allowing

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doctors to consider the unique characteristics of each individual. A personalized approach increases customer satisfaction and promotes trusting relationships with medical personnel, which is the key to successful and long-term treatment. [5]

Many studies confirm that IT solutions have a positive impact on the quality of dental treatment. Examples of the successful application of digital technologies cover the practice of the Moscow clinic, where

SLO/SLY systems for the production of dental prostheses and implants allowed for a 40% reduction in manufacturing time. This led to an increase in the number of clients served and an increase in their satisfaction. In St. Petersburg, a private clinic successfully implemented a system of electronic medical records and digital monitoring, which improved the monitoring of people's health, reduced the number of errors, and increased the effectiveness of interaction.

Despite numerous advantages, the introduction of digital technologies in dentistry is accompanied by serious challenges and limitations. A significant obstacle is the technical and financial barriers. High equipment and software costs can become insurmountable for some private clinics and practicing physicians. Maintenance and modernization of systems require additional investments, increasing operating costs.

The problems of confidentiality and data protection remain relevant, as the expansion of IT application increases the likelihood of sensitive information leaks. Strict adherence to data protection standards requires the implementation of complex encryption and authentication mechanisms.

Another important obstacle is the training and adaptation of medical personnel. Not all dentists and medical professionals possess the necessary skills to work with the latest high-tech solutions, necessitating the expansion of their professional competencies.

The prospects for the development of digital technologies in dentistry seem promising and innovative. It is expected that the further establishment of robotization and the use of artificial intelligence will allow for the automation of procedures, improving diagnostic capabilities, and adjusting treatment taking into account people's individual characteristics. Automated thinking can be used to analyze extensive health data, predicting the risks of dental and gingival diseases, and robotic systems for careful surgical operations.

Moreover, significant opportunities are opening up for the integration of digital dentistry with mobile applications and telemedicine platforms. This ensures continuous monitoring of patients' health and facilitates interaction with doctors in real-time, making medical services more accessible and convenient.

In conclusion, it's worth noting that digitalization is transforming dentistry, increasing the accuracy and level of treatment through innovations such as SD scanning and CAD/CAM systems. Despite the obstacles, continuing technological development offers encouraging prospects for further improvement of medical practice, promising to make dental care more accessible and convenient for patients worldwide.

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