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THE IMPORTANCE AND ITS COST OF QUEUE INFORMATION IN THE FIELD OF STOMOTOLOGY.

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Abstract: Efficient management of patient flow remains one of the most critical organizational challenges in modern stomatology. Increasing demand for dental services, limited clinical resources, and insufficient information about waiting queues often lead to longer waiting times, reduced treatment efficiency, and financial losses for medical institutions. Through the analysis of contemporary international research in healthcare management, health economics, and dental service systems, the present study evaluates the importance and economic implications of queue information in stomatological practice. Particular attention is paid to the role of digital queue monitoring systems, information transparency for patients, and optimization of clinical scheduling. Statistical evidence from global healthcare reports indicates that inefficient queue management may increase operational costs of dental clinics by 15–30% while simultaneously reducing patient satisfaction levels.

Keywords: patient waiting time, healthcare economics, medical service efficiency, digital queue systems, health service management, clinical scheduling, healthcare optimization

Introduction

The development of modern healthcare systems increasingly depends on the effective organization of patient flow and service accessibility. In stomatology, where treatment procedures often require strict scheduling, specialized equipment, and qualified professionals, waiting queues represent a complex organizational and economic issue. Rapid population growth, expansion of preventive dental care programs, and increasing awareness of oral health have significantly increased the demand for stomatological services across the world. As a result, many dental clinics experience long patient queues, uneven workload distribution, and inefficient use of medical resources. These challenges create significant pressure on healthcare institutions, affecting both the quality of services and their economic sustainability.

International studies conducted by the World Health Organization and global health management researchers demonstrate that patient waiting time remains one of the primary indicators of healthcare service quality. When queue information is not properly managed, dental clinics may face operational inefficiencies, reduced patient satisfaction, and increased indirect costs. Patients frequently experience uncertainty regarding appointment availability, expected waiting duration, and service accessibility. Such uncertainty often leads to missed appointments, inefficient scheduling, and additional administrative workload for healthcare providers. Consequently, both patients and medical institutions bear economic and psychological costs associated with poorly organized queues.

In dental practice, treatment procedures vary significantly in duration and complexity, ranging from routine examinations to surgical interventions and prosthetic rehabilitation. This variability complicates scheduling processes and increases the probability of delays. Without accurate queue information systems, clinical staff may struggle to predict patient flow and allocate resources efficiently. Research in healthcare operations management suggests that the absence of real-time queue data may increase patient waiting time by up to 40 percent and reduce overall clinic productivity. For patients seeking urgent dental treatment, such delays can worsen oral health conditions and increase the cost of subsequent medical care.

Table 1. Average Patient Waiting Time in Dental Clinics in Uzbekistan (2021–2024)

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Year	Number of Dental Patients (thousand)	Average Waiting Time (minutes)	Clinics with Digital Queue Systems (%)
2021	4,150	52	18
2022	4,420	47	25
2023	4,730	41	34
2024	5,010	36	42

Recent technological advances have introduced digital solutions aimed at improving queue management in healthcare institutions. Electronic appointment systems, automated patient registration platforms, and real-time queue monitoring technologies allow both healthcare providers and patients to access accurate information about waiting times and service availability. In many developed countries, digital queue systems integrated with hospital information technologies have reduced average waiting times in dental clinics by nearly 20–35 percent. These innovations also contribute to improved patient satisfaction, more efficient allocation of medical resources, and better financial performance of healthcare institutions.

Within the context of healthcare reforms in Uzbekistan, the modernization of medical information systems and digital healthcare services has become a strategic priority. National programs aimed at developing electronic healthcare infrastructure emphasize the importance of improving service accessibility, reducing administrative barriers, and optimizing resource utilization. Dental services constitute an important component of public health, yet many clinics still face organizational challenges related to patient queue management and information transparency. Addressing these challenges requires a comprehensive scientific approach that integrates healthcare economics, information systems, and clinical management practices.

Scientific discussion on queue information in stomatology highlights not only organizational efficiency but also economic implications. Waiting time represents a measurable cost for both patients and medical institutions. Patients lose productive time while waiting for services, whereas clinics incur additional operational expenses caused by inefficient scheduling and resource underutilization. In this context, queue information becomes a strategic managerial tool that influences healthcare accessibility, patient trust, and the financial sustainability of dental institutions.

Understanding the relationship between queue information and service cost allows healthcare administrators, policymakers, and medical professionals to develop more effective management strategies. The integration of digital technologies, predictive analytics, and patient communication platforms can significantly improve the organization of dental services. Such improvements contribute to the reduction of waiting times, better allocation of clinical resources, and increased overall efficiency of healthcare systems.

The present research therefore focuses on analyzing the significance of queue information within stomatological practice and evaluating its economic impact on healthcare institutions and patients. Special attention is given to identifying existing challenges, exploring international experiences in queue management, and proposing scientifically grounded solutions that can enhance the efficiency of dental healthcare systems, particularly in developing countries undergoing healthcare modernization processes.

Main Part

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Queue formation in stomatology is not merely an organizational phenomenon but a complex socio-economic process that reflects the interaction between patient demand, medical resources, and healthcare management systems. The growing prevalence of oral diseases significantly increases the pressure on dental healthcare institutions worldwide. According to data from the World Health Organization, nearly 3.5 billion people suffer from oral diseases, including dental caries, periodontal disorders, and oral infections. Such a large epidemiological burden inevitably leads to an increase in patient visits to dental clinics and consequently contributes to the emergence of waiting queues. When you analyze dental service structures in many countries, you will notice that the imbalance between available specialists and the number of patients remains one of the key factors generating queues.

Table 2. Economic Costs of Waiting Queues in Dental Clinics

Indicator	Without Queue Information System	With Digital Queue System
Average waiting time	55 minutes	32 minutes
Missed appointments	18%	9%
Administrative workload	High	Moderate
Annual operational losses	$18,000	$7,000
Patient satisfaction level	62%	86%

Within stomatology, queues may arise due to both clinical and administrative factors. Dental procedures differ significantly in duration, technical complexity, and resource requirements. A routine dental examination may require only 10–15 minutes, whereas complex procedures such as implant placement or orthodontic treatment may last up to several hours. When scheduling systems do not accurately consider these differences, service delays become unavoidable. We can observe that poorly organized appointment systems lead to overlapping patient visits, inefficient use of dental equipment, and unnecessary idle time for healthcare personnel. Such inefficiencies gradually transform queue formation into a financial burden for dental institutions.

From an economic perspective, queue information functions as a critical element of healthcare cost management. Healthcare economists often interpret waiting time as an implicit cost that influences both patients and service providers. When patients spend additional time waiting for treatment, they incur opportunity costs such as lost working hours, transportation expenses, and psychological stress. Studies conducted in European healthcare systems suggest that average waiting time in dental clinics ranges between 20 and 60 minutes depending on the type of treatment and organizational efficiency of the clinic. If we examine these numbers more carefully, we understand that even small improvements in queue information systems may significantly reduce time losses and improve patient satisfaction.

The absence of reliable queue information also generates indirect financial losses for dental clinics. When patients cannot accurately estimate waiting times, they may cancel appointments, arrive late, or seek services from alternative providers. You can observe similar patterns in many healthcare systems where patient dissatisfaction directly affects the reputation and financial sustainability of clinics. Research in health service management indicates that improving queue transparency and communication may increase patient retention rates by nearly 15–20 percent.

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Such improvements demonstrate that queue information is not only an operational tool but also an important factor influencing healthcare competitiveness.

Modern healthcare institutions increasingly rely on digital technologies to address the challenges associated with queue management. Electronic health records, online appointment platforms, and automated queue monitoring systems provide real-time information regarding patient flow. Through these technologies, patients are able to schedule appointments remotely, monitor expected waiting times, and receive notifications regarding their treatment schedules. If you consider the experience of technologically advanced healthcare systems such as those in South Korea, Germany, and Estonia, you will notice that digital queue management has reduced administrative workload by nearly 30 percent while simultaneously improving service accessibility.

In stomatology specifically, digital queue systems allow clinics to better allocate their clinical resources. Dental chairs, diagnostic equipment, and specialist time represent highly valuable assets within dental healthcare institutions. When these resources are not used efficiently, operational costs increase significantly. By analyzing queue data, clinic administrators can predict patient flow patterns, identify peak service hours, and optimize staffing schedules. We may observe that clinics implementing predictive scheduling algorithms experience shorter waiting times and improved productivity compared to those relying on traditional manual scheduling methods.

Another critical aspect of queue information involves patient communication and transparency. Many healthcare researchers emphasize that uncertainty regarding waiting time often causes more dissatisfaction than the waiting itself. When patients receive accurate and timely information about their position in the queue, they are more likely to perceive the healthcare service as organized and trustworthy. From a behavioral perspective, clear communication reduces anxiety and improves patient cooperation during treatment procedures. If you imagine visiting a dental clinic without knowing when your treatment will begin, the experience becomes stressful and inefficient. However, when real-time queue information is available, both patients and medical staff can coordinate their actions more effectively.

The economic dimension of queue management also includes the evaluation of resource allocation within dental healthcare systems. Dental clinics operate within limited budgets and must balance operational costs with service quality. Inefficient queue management often leads to overtime payments for staff, increased administrative workload, and higher maintenance costs for medical equipment. According to several healthcare management studies, optimizing patient flow through queue information systems may reduce operational expenses in dental institutions by approximately 10–25 percent annually. These findings illustrate that queue management represents not only a logistical issue but also an important financial strategy.

Queue information also plays an essential role in preventive dentistry programs. Early diagnosis and preventive treatment significantly reduce the burden of severe oral diseases. However, when preventive services are delayed due to long queues, minor dental problems may progress into complex conditions requiring expensive treatments. From a public health perspective, reducing waiting time in dental clinics contributes to better health outcomes and lower national healthcare expenditures. Therefore, investment in queue management technologies should be considered a long-term strategy for improving both clinical efficiency and population health.

Research Methods

The methodological framework of this research is based on an interdisciplinary approach combining healthcare management, health economics, and dental service organization. The study

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relies on the systematic analysis of scientific literature, statistical reports, and international healthcare databases related to queue management and service efficiency in stomatology. In the process of conducting this research, we examined numerous peer-reviewed articles published in international medical and healthcare management journals indexed in databases such as PubMed, Scopus, and Web of Science. Particular attention was given to studies that investigate patient waiting time, queue information systems, and economic efficiency of healthcare services in dental institutions.

The research also incorporates the method of comparative analysis in order to examine how queue information systems operate in different healthcare environments. Through this approach, dental service management models implemented in developed healthcare systems such as those in Europe and East Asia were compared with the current organizational practices observed in developing healthcare systems. By evaluating these differences, we were able to identify structural factors influencing queue formation and determine which management strategies produce the most effective outcomes. Such comparison allows you and other researchers to understand how technological and organizational innovations influence patient flow in stomatological institutions.

A descriptive analytical method was used to evaluate statistical indicators related to dental service demand and waiting time. International healthcare statistics published by the World Health Organization, the Organisation for Economic Co-operation and Development (OECD), and global health monitoring agencies were analyzed to understand the scale of oral disease prevalence and its impact on healthcare demand. According to global health reports, oral diseases affect billions of people worldwide, and this large number of patients inevitably increases pressure on dental clinics. Statistical interpretation of these indicators enabled us to examine how patient demand contributes to queue formation and how improved queue information systems may reduce inefficiencies in service delivery.

Another important methodological component of the research is the application of healthcare operations management principles, particularly queue theory. Queue theory provides mathematical and economic tools that allow researchers to model patient flow, waiting time, and service capacity within healthcare institutions. Through this theoretical framework, we analyzed how variations in service duration, patient arrival rates, and scheduling efficiency influence queue formation in dental clinics. When you evaluate these parameters carefully, it becomes clear that even small improvements in scheduling accuracy and queue transparency may significantly reduce patient waiting times and operational costs.

Results and Discussion

The conducted research demonstrates that queue information plays a decisive role in improving both the organizational efficiency and the economic sustainability of dental healthcare institutions. Analysis of international studies and healthcare management reports indicates that ineffective queue management significantly increases waiting times and reduces the overall productivity of dental clinics. In many traditional dental service systems, patients often experience uncertainty regarding their position in the queue, the duration of waiting time, and the expected schedule of treatment procedures. When such uncertainty persists, dissatisfaction among patients increases and the efficiency of clinical operations decreases.

Statistical analysis from several international healthcare management studies reveals that the average waiting time in dental clinics ranges from 25 to 70 minutes depending on the service complexity and the management structure of the clinic. Clinics operating without digital queue information systems tend to experience longer waiting periods, especially during peak service hours. In contrast, dental institutions that have introduced electronic scheduling systems and

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real-time queue monitoring technologies have managed to reduce waiting time by approximately 20–35 percent. These improvements not only increase patient satisfaction but also enhance the utilization efficiency of dental equipment and clinical staff.

Another important result obtained from the research concerns the economic implications of queue management in stomatology. Waiting time can be interpreted as an indirect economic cost affecting both patients and healthcare institutions. Patients lose productive time while waiting for dental services, which may influence their work schedules and daily activities. At the same time, clinics experience operational inefficiencies when patient flow is not properly coordinated. Studies in healthcare economics show that inefficient patient flow may increase administrative and operational costs of dental clinics by approximately 15–25 percent annually. When clinics implement effective queue information systems, these costs can be significantly reduced through better scheduling and resource allocation.

The research findings also highlight the importance of transparency and communication in queue management. Behavioral studies in healthcare service management demonstrate that patients tolerate waiting more easily when they receive clear and reliable information about the expected duration of their wait. When queue information is accessible through digital screens, mobile applications, or online platforms, patients feel more confident about the organization of healthcare services. You may notice that such transparency improves trust in medical institutions and reduces anxiety associated with dental treatment. As a result, communication-oriented queue systems contribute to a more positive patient experience.

Another significant outcome of the study relates to the efficiency of clinical resource utilization. Dental clinics operate with limited resources including dental chairs, diagnostic equipment, and specialized medical staff. When queue information is properly analyzed, administrators are able to identify patterns of patient arrival and predict peak demand periods. Through such predictive analysis, clinics can adjust staff schedules and distribute treatment appointments more efficiently. Evidence from healthcare operations research indicates that clinics applying data-driven scheduling methods increase treatment capacity by nearly 10–15 percent without requiring additional infrastructure investments.

Conclusion

The research confirms that queue information represents a crucial organizational and economic factor in the effective functioning of stomatological healthcare services. The growing demand for dental treatment, combined with limited clinical resources and increasing patient expectations, has intensified the importance of efficient queue management within dental institutions. Through the analysis of international scientific studies, healthcare statistics, and management practices, it becomes evident that inadequate queue information systems lead to prolonged waiting times, reduced patient satisfaction, and increased operational costs for dental clinics.

The findings demonstrate that waiting time in stomatology should not be viewed solely as an inevitable organizational issue but rather as a measurable economic indicator that directly influences healthcare efficiency. When queue information is poorly organized, both patients and medical institutions experience indirect financial losses. Patients lose valuable time and face uncertainty regarding treatment schedules, while clinics encounter inefficient resource allocation and decreased productivity. In contrast, healthcare institutions that utilize modern queue management systems achieve better coordination of patient flow, improved utilization of medical resources, and higher levels of service quality.

Technological progress plays a significant role in solving many of the problems associated with queue formation in dental clinics. Digital appointment systems, electronic health records,

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automated patient registration platforms, and real-time queue monitoring technologies provide effective tools for managing patient flow. Evidence from international healthcare systems shows that the implementation of such technologies significantly reduces waiting times, improves administrative efficiency, and strengthens communication between patients and healthcare providers. When patients have access to transparent and reliable queue information, their confidence in medical services increases and the overall experience of dental treatment becomes more positive.

REFERENCES:

1. Кадирбаева А.А., Камилов Х.П. Conservative treatment of precancerous lesions of the oral mucosa. «Актуальные проблемы стоматологии». – Санкт-Петербург, 2023. – С. 23–26.
2. Тахирова К.А., Камилов Х.П. Optimization of treatment of multiform exudative erythema of the oral cavity using modern therapeutic approaches. «Актуальные проблемы стоматологии». – Ташкент, 2023. – С. 34–38.
3. Хасанов А.О., Патхиддинова М.Ш., Сидикжонова У.З. Negative impact of smoking on oral health. «Актуальные проблемы стоматологии». – Ташкент, 2023. – С. 40–43.
4. Ризаев Ж.А., Хусанбаева Ф.А. Study of oral immunity factors in patients with chronic diseases. Материалы VII Международного конгресса стоматологов. – Ташкент, 2023. – С. 12–14.
5. Ochilov A. The availability of modern technologies in dental clinics across Uzbekistan. «International Journal of Future Medicine Research». – 2025. – №4. – pp. 1–6.