Keywords
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Does Frequent Use of Electronic Health Systems Improve Clinical Outcomes in Dental Practice? Evidence from Saudi Arabia

Abstract
The objective of this review was to assess the role of frequent use of Electronic Health Systems (EHS) in clinical outcomes of dental practice, with special emphasis on Saudi Arabian evidence. A narrative review of peer-reviewed literature published within the last 15 years was conducted. International and Saudi-based studies addressing EHS use in dentistry were analysed, with emphasis on system utilisation frequency, clinical workflows, and measurable outcomes such as diagnostic accuracy, patient safety, treatment efficiency, and continuity of care. The evidence shows that the high and meaningful use of EHS, not just the adoption of the system, correlates with the high quality of documentation, increased diagnostic consistency, a high quality of the preventive care delivery, and efficiency in the working process. The field of international studies has shown that regular access to advanced EHS functionalities has more clinical benefits than infrequent access. The Saudi evidence also indicates that there is high adoption of EHS in the dental setting, especially in public and academic dental settings, but the inconsistency in the level of usage, training, and the usability of the system prevents the consistent improvement of the outcomes. Frequent EHS use has the potential to positively influence dental clinical outcomes, but its effectiveness depends on user proficiency, system integration, and institutional support. Evidence from Saudi Arabia suggests progress in adoption, yet highlights gaps in outcome-focused research. Promoting frequent, clinically meaningful EHS use can enhance quality, safety, and efficiency in dental practice, supporting outcome-based and digitally enabled oral healthcare.

1. Introduction

Electronic Health Systems (EHS) have become part of the contemporary healthcare delivery system, helping to systematically gather, store and share information about the health of patients. Electronic Dental Records (EDR) in dental practice are an example of EHS that is more specific to diagnostic procedures, treatment planning, documentation, and continuation of care. The systems combine clinical data, radiographic images, appointment scheduling and billing information, therefore, increasing efficiency in clinical workflow and accessibility of data.[1]

The trends in the adoption of EHS have been quickening throughout the last 20 years all over the world as a result of technological progress, governmental movements, and the growth of the focus on evidence-based practice. Most healthcare systems have shifted from paper-based systems to digital systems to enhance care coordination, decrease medical errors, and improve clinical decision-making. The EHS uptake in dentistry has taken a relatively similar path, albeit at a rather slower rate, because of differences in the scale of practice, cost factors and training needs.[2] However, as per the current research, there is an increasing use of EDRs both in public and private dental care facilities across the globe.

Quality in dental care is mainly measured by clinical outcomes, which include accuracy in diagnosis, effectiveness in treatment, patient safety and patient satisfaction. Effective record keeping and access to patient information at the right time are important factors towards ensuring positive results. EHS can positively impact such outcomes by enhancing information accuracy, providing clinical decision support, and preventing and managing follow-up care. Nevertheless, the enhancement of the result cannot be achieved only due to the presence of the system but also due to the rate and intensity of the system utilisation by dental practitioners.[3]

The digital transformation in health has become widely promoted in Saudi Arabia by the governmental program of Vision 2030, where the modernisation of the health sector and the use of technology to deliver care are set as priorities. The Saudi Ministry of Health has established EHS programs on the national level to promote efficiency, interoperability, and patient-centred care in healthcare. This change has seen an expansion of the use of electronic systems in dental services, especially in governmental and academic institutions. [4]

Despite this progress, variability in usage patterns among dental practitioners remains evident.

Although the available literature has emphasised the overall advantages of the adoption of EHS, there is a significant gap in research relating to the frequency of EHS use and quantifiable clinical outcomes of dental practice, particularly in the Saudi environment. The majority of the studies concentrate on the implementation of systems, user satisfaction, or perceived benefits and not on objective measures of clinical performance. [5] As a result, the factual data on the correlation between routine and intensive use of EHS and better dental results are scarce.

The purpose of the review is to critically evaluate the statement in the research on whether the frequent use of Electronic Health Systems can enhance clinical outcomes in the dental practice, with particular attention to the evidence in Saudi Arabia. These are to review the literature on the use of EHS in dentistry to date, assess its effects on clinical outcomes, and provide gaps to guide future research and policy formulation. Figure 1 shows the development of the electronic health system in both healthcare and dentistry.

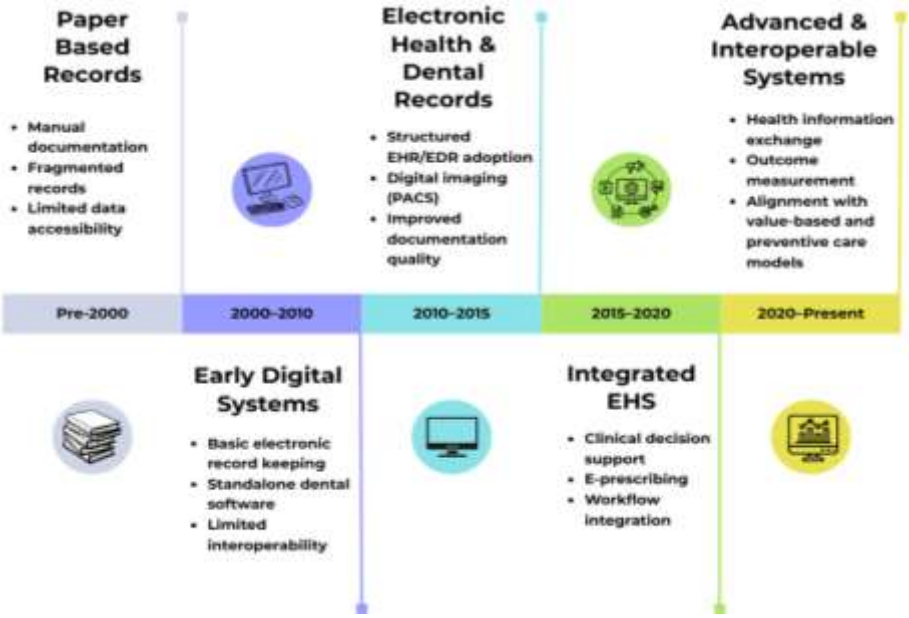

Figure 1. Evolution of Electronic Health Systems in Healthcare and Dentistry

2. Electronic Health Systems in Dental Practice

Electronic Health Systems (EHS) in dentistry are fully computer-based systems that are meant to assist in the management of clinical, administrative, and diagnostic data unique to oral healthcare. These systems are based on Electronic Dental Records (EDR) that contain patient demographics, medical and dental histories, clinical notes, periodontal charts, treatment plans, and billing data. EHS in dental environments are designed with the nature of dental care, which is primarily procedural and heavy on images, and, therefore, they differ from general medical electronic records. [6]

Contemporary dental EHS is a system that has several interrelated elements. These comprise clinical documentation EDR systems, Radiographic image storage and retrieval, Picture Archiving and Communication Systems (PACS), electronic prescription, appointment and practice management systems and clinical decision support systems. Collectively, these elements allow the smooth flow of data through the diagnostic, therapeutic, and administrative activities, improving the precision and availability of information. [7]

Many kinds of EHS applications are commonly utilised in the dental practice. PACS are very important in the management of intraoral radiographs, panoramic radiographs, and cone-beam CT scans, which are key to diagnosis and treatment plans. E-prescribing systems enhance medication safety by minimising errors in prescription and assisting with drug interaction checks. Clinical decision support systems help dentists by sending alerts, reminders, and evidence-based suggestions when a dentist meets a patient, whereas

appointment and recall systems provide continuity of care.[7,8]

The primary condition to maximise the value of EHS in dental clinics is efficient workflow integration. Electronic systems, when implemented correctly, simplify the chairside documentation process, lower the amount of information that needs to be entered manually, and assist in providing real-time patient information. Nevertheless, lack of usability of systems, poor customization and lack of training may interfere with clinical processes and augment documentation. The effective integration is thus reliant on the way systems are designed, supported by the organisation, and the ability of the user. [9]

The advantages of EHS in dental practices are that it leads to the enhancement of the quality of documentation, the accuracy of diagnosis, the alignment of the dental staff members, and the operational efficiency. There are also electronic systems that facilitate audit, research and quality improvement programs. In spite of these benefits, some challenges encountered by dental practitioners include the high cost of implementation, resistance to change, data privacy, and inconsistency in system interoperability, especially in smaller practices. [10]

EHS and dental institutions in Saudi Arabia. Dental facilities, particularly in governmental hospitals, universities, and major private healthcare networks, have started to implement EHS as part of the national digital health programs. Widespread systems incorporate in-house hospital information systems that incorporate dental modules, autonomous EDR software, and centralised PACS systems that meet the standards of the Ministry of Health. Although there has been a rise in system availability, disparities in the use of functionality and user expertise still occur in institutions. [11]

Table 1 outlines the main elements of the Electronic Health Systems that are regularly utilised within the dental practice, and their clinical implications.

Table 1. Key Components of Electronic Health Systems in Dental Practice

Component	Description	Clinical Relevance in Dentistry
Electronic Dental Records (EDR)	Digital repository of patient dental and medical information, including histories, diagnoses, treatment plans, and progress notes	Improves documentation accuracy, continuity of care, and longitudinal patient tracking
Picture Archiving and Communication System (PACS)	Digital storage and retrieval system for dental radiographs and imaging (e.g., intraoral X-rays, panoramic images, CBCT scans)	Enhances diagnostic accuracy, treatment planning, and interdisciplinary consultation
Appointment and Practice Management Systems	Scheduling, recall, billing, and administrative management tools	Supports workflow efficiency, reduces missed appointments, and improves clinic productivity
Electronic Prescribing (e-Prescribing)	Digital generation and transmission of prescriptions	Reduces medication errors, supports drug interaction checks, and improves patient safety
Clinical Decision Support Systems (CDSS)	Embedded alerts, reminders, and evidence-based recommendations	Assists clinical decision-making, preventive care delivery, and guideline adherence
Interoperability and Health Information Exchange	Data sharing between dental and broader healthcare systems	Facilitates continuity of care and integration with medical records

3. Clinical Outcomes in Dental Care

3.1 Definition of Clinical Outcomes in Dentistry

In dentistry, clinical outcomes are quantifiable improvements in the oral health conditions of a patient as an outcome of diagnostic, preventive or therapeutic interventions. These are the outcomes that are determined to measure the effectiveness, safety, and quality of dental care and are becoming more accepted as vital measures of clinical performance. In contrast to process measures, clinical outcomes are those that concentrate on the real effect of care on the health, functioning, and well-being of patients. [12]

3.2 Treatment Accuracy and Diagnostic Quality

Accuracy of treatment and quality of diagnosis are core clinical outcome measures in the field of dentistry. Proper diagnoses are based on patient information, quality imaging and documentation. Misdiagnosis or misplaced treatment planning may result in improper intervention, complications or treatment failure. Research has demonstrated that clinical data, standardised documentation, and structured data are becoming more effective in treating and diagnosing dentistry in terms of consistency. [13]

3.3 Patient Safety and Error Reduction

Patient safety in dental practice is the prevention of adverse events, including medication errors, complications related to the dental procedure, and mistakes which can be made during documentation. Lack of complete or accurate records is also a significant cause of clinical errors. The frameworks of outcome measurements are putting more focus on the safety indicators, such as the rate of errors, the reporting of adverse events, and adherence to clinical guidelines. The decrease in preventable dental errors is closely connected with improved documentation and a greater amount of available data. [14]

3.4 Treatment Efficiency and Time Management

Efficiency of treatment means the possibility to provide high-quality dental care during the best time frames,

avoiding delays or redundancies. Efficiency is often measured by indicators including the duration of appointment, the time taken to complete the treatment and patient throughput. Effective clinical processes will lead to enhanced patient experiences and increased use of clinical resources. The studies indicate that effective dental care delivery critically depends on systematic documentation and access to data in time. [15]

3.5 Patient Satisfaction and Continuity of Care

The multidimensional outcome is patient satisfaction, which is affected by communication, outcome of treatment, waiting times and continuity of care. The continuity is especially critical in the dentistry field, where follow-up and long-term management are usually necessary. Good clinical records facilitate continuity through the provision of consistent care between visits and even providers. It has been shown that better patient satisfaction and better long-term outcomes are related to better record completeness and accessibility.[16]

3.6 Role of Data Quality and Documentation in Outcome Measurement

Data quality is important to measure clinical outcomes reliably. Proper, full and standard documentation is necessary to assess the efficacy of treatment, track the patient, and outcome based research. The quality of the data can be compromised by bad data, and this may lead to a lack of clarity regarding the real clinical performance and reduce the capacity to analyse the quality of care. Data integrity is therefore coming out as an important outcome measurement determinant in dental and the larger healthcare settings. [17] Figure 2 displays the association between the functionalities of electronic health systems and the important dental clinical outcomes.

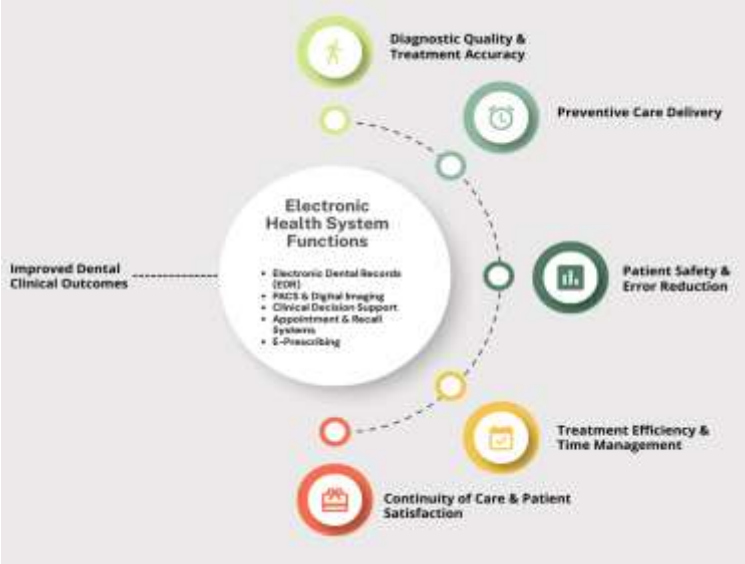

Figure 2. Relationship Between EHS Functions and Dental Clinical Outcomes

4. Evidence on Frequent Use of Electronic Health Systems

4.1 International Evidence Linking EHS Usage Frequency to Clinical Performance

Global research is becoming more and more important in its recommendations that the prevalence and the severity of EHS utilisation, as opposed to the very availability of systems, is a decisive factor in clinical performance. A body of research in the various scientific fields of healthcare has shown that clinicians with regular interaction with EHS have better documentation, more compliant clinical guidelines, and improved care coordination. Structured data entry, clinical alerts, and integrated imaging are more commonly used by frequent EHS users in the area of dentistry, which leads to increased clinical consistency and clinical performance. [18]

4.2 Impact of Routine and Advanced EHS Use on Diagnostic Accuracy

Daily and sophisticated use of EHS is linked to the enhancement of diagnostic accuracy. The long-term advantage of such access is that frequent users can access patient histories, standardised diagnostic templates, and radiographic data. All these characteristics facilitate in-depth examinations and minimize chances of omitting discoveries. Research shows that when clinicians frequently use advanced EHS functions, they have increased diagnostic concordance and decreased variability in clinical decision-making. [19]

4.3 Influence on Preventive Care Delivery

Continuous use of EHS is especially sensitive to preventive care delivery. EHS embedded automated reminders, recalls, and preventive care alerts make it possible to provide timely interventions, including prophylaxis, fluoride application and periodontal maintenance. It is indicated that one of the possible effects of using these features regularly is higher adherence to preventive care guidelines and better oral health outcomes in the long term. [20]

4.4 Treatment Planning and Follow-Up

The frequency of EHS usage also has an impact on the treatment planning and follow-up effectiveness. Regulars may be more inclined to record detailed treatment plans, track progress and continuity through

subsequent visits. Increased follow-up tracking and electronic alerts assist in adherence to pre-defined care trajectories and minimise treatment disruptions. On the other hand, these capabilities are not used by infrequent users, which restricts the possible advantages of electronic systems. [21]

4.5 Differences Between Occasional and Frequent Users

Comparative analyses indicate that occasional and frequent EHS users have major differences. Regular users are more efficient and have more confidence in the usage of the systems, and the quality of clinical documentation is better. The occasional users, on the other hand, tend to stick to simple features and might consider EHS as a time waster or distraction. All these variations provide a better understanding of the significance of user engagement, training, and experience in the translation of EHS use into quantifiable clinical improvements. [22]

4.6 Barriers and Methodological Limitations in Existing Studies

Although evidence is increasing, there are still a number of obstacles that prevent successful and regular EHS application. These are bad usability of the system, misalignment of the workflow, lack of interoperability and lack of training. Also, the current research is associated with methodological shortcomings, including the use of self-reported usage, a cross-sectional study design, and heterogeneous outcomes, which make it challenging to make causal inferences about the frequency of EHS use and clinical outcomes. [23] Table 2 presents a summary of the major international studies that have been conducted to determine the correlation between Electronic Health System use and clinical outcomes.

Table 2. Summary of Key Studies on EHS Use and Clinical Outcomes

Author(s) & Year	Study Design	Setting	Key Findings Related to EHS Use Frequency
Menachemi & Collum (2011)	Narrative review	Healthcare (multi-speciality)	Frequent EHR use is associated with improved documentation and care coordination.
Kazley & Ozcan (2014)	Quantitative efficiency analysis	U.S. hospitals	Higher EHR utilisation linked to improved clinical efficiency
Nguyen et al. (2014)	Evaluation study	Healthcare organizations	Regular users demonstrated better system integration and perceived benefits.
Persell et al. (2016)	Interventional study	Primary care	Routine EHR-based reminders improved preventive care delivery
Cabitza et al. (2017)	Conceptual analysis	Clinical decision systems	The advanced system uses improved diagnostic consistency, but requires user competence.
Adler-Milstein et al. (2015)	Comparative policy analysis	OECD countries	Outcomes depended on the depth and consistency of system use rather than adoption alone.

5. Evidence from Saudi Arabia

5.1 Overview of EHS Adoption in Saudi Healthcare and Dental Sectors

National reform agendas, which concentrate on quality, efficiency, and patient-centred care, have been the key drivers of a fast-paced digital transformation of the healthcare sector in Saudi Arabia in the last decade. The Electronic Health Systems (EHS) have been introduced as a pillar to this change, which allows the management of data and the ability of data to coordinate the care and deliver health services in a better manner. Nationwide programs have helped to encourage the adoption of electronic health records, referral systems, and health information exchange systems by government healthcare facilities.[24]

The adoption of electronic dental records (EDRs) has grown significantly in the field of dentistry, especially in government hospitals, academic dental clinics and in large private health care organisations. Nevertheless, adoption differs in different settings, with smaller private dental practices usually adopting fewer EHS functionalities. The Saudi-based evidence suggests that although the level of system availability is growing, the level and frequency of EHS utilisation vary among dental professionals, which could affect the possible effect on clinical outcomes. [11]

5.2 Usage Patterns Among Dentists in Saudi Arabia

According to Saudi-based research, the EHS usage among dentists is heterogeneous, based on such aspects as simple administrative utilisation to complex clinical records and decision-making support capabilities. According to Majid et al., nearly 93% of the surveyed dental practices in Jeddah already used EDRs, with more of them being associated with the public-sector clinics and larger practices. Although the uptake was high, EDRs were shown to be more utilised by dentists to schedule appointments and billing, and not to provide evidence-based clinical documentation. [11]

In the case of EDRs, some perceptions of usefulness and usability also determine the frequency of usage. In a study by the University of Hail, dental scholars and students recognised the importance of EDRs in record accuracy and accessibility but noted that time spent on documentation and the disturbance of the workflow were problematic during the initial levels of implementation. [25] These results indicate that familiarity, training, and experience are important determinants of the use of EHS occasionally or routinely in clinical care.

5.3 Impact on Workflow and Patient Care

The perceived influence of EHS on dental workflow and patient care in Saudi Arabia is directly related to the usability of the system and its inclusion in clinical

practices. Alshammari et al. tested the usability of the Salud electronic dental record system at a dental college in Saudi Arabia and claimed low scores of usability among the first-time users. [26] According to the participants, the obstacle to the regular use of the system was the complexity of navigation and system inefficiencies that might present a barrier to the quality of patient care offered by the system.

Broader healthcare evidence from Saudi primary care settings supports these findings. Alzghaibi and Hutchings discovered that clinicians acknowledged the clinical importance of EHS, but the lack of training and the involvement of users in the implementation process led to lower satisfaction and use on a regular basis. [27] These workflow issues are especially applicable to the dental clinics, where the high-patient turnover and the necessity of the procedures to be efficient and easy to use presuppose the existence of efficient and intuitive documentation systems.

5.4 Role of Institutional Policies and Training

Training systems and institutional policies play a big role in determining the use of EHS in Saudi dental practice. Standardisation, interoperability, and building workforce capacity are identified as the requirements of the successful use of EHS in national digital health strategies (MOH, n.d.). Nevertheless, there is evidence that dental environment training is usually based on system navigation training instead of clinical optimisation, which restricts the scope of utilising EHS to facilitate diagnostic precision, preventative care, and treatment follow-up. [25]

Moreover, the legislation programs, like the National Platform for Health Information Exchange Services (NPHIES) by the Council of Cooperative Health Insurance (2021), promote the standardised digital documentation and electronic claims processing. [28] Although it is mainly insurance-based, these programs indirectly facilitate the greater regularity of digital records use and data completeness, which are critical to continuity of care and outcome measures in dentistry.

5.5 Alignment with Saudi Vision 2030 Digital Health Initiatives

Digital innovation is one of the key points of Saudi Vision 2030 that can be used to enhance the quality, access, and sustainability of healthcare. The Health Sector Transformation Program identifies the areas of digital health adoption, preventive care, and performance measurement as a strategic priority (MOH, n.d.). In the case of dental services, this policy environment provides incentives related to the comprehensive EHS use, its integration with the more comprehensive health systems, and the outcome-oriented practice models.

Incentivising interoperable records and standardised data collection, Vision 2030 projects contribute to the conditions in which the frequent use of EHS may have a positive impact on dental clinical outcomes. Nevertheless, policy alignment does not necessarily lead to the same use at the clinical level, which is why it is vital to talk about the organisational support and user engagement. [27]

5.6 Identified Gaps in National Dental Research

In spite of significant advancements in EHS use, there are still huge gaps in Saudi dental research. Originally, there are limited studies that provide a direct correlation between the frequency of EHS use and objective clinical results in dental care, e.g., diagnostic accuracy, delivery of preventive services, or reduction of errors. [11] Second, outcome measures are often inconsistent or poorly standardised across studies, limiting comparability and generalizability.

The methodological shortcomings remain, as the study that utilises cross-sectional surveys and self-reported perceptions instead of system-generated usage data is still prevalent. [26] Moreover, the dental practice in the private sector and in rural areas is underrepresented in the research of the country, which limits the knowledge of EHS usage rates in different care environments. These gaps are critical to fill so as to produce strong evidence on the impact of regular use of EHS among Saudi Arabian clinical dental practices. Figure 3 provides the adoption and use of electronic health systems in Saudi dental practice in terms of policy drivers to clinical outcomes.

Figure 3. Adoption and Utilisation of Electronic Health Systems in Saudi Dental Practice

Implications for Dental Practice and Future Research

6.1 Implications for Dental Practitioners

The reviewed evidence indicates that Electronic Health Systems (EHS) benefits in dentistry are most evident in instances where the systems are utilised regularly and in a meaningful manner, as opposed to occasional usage. In the case of dental practitioners, this reiterates the need to incorporate EHS in the process of normal clinical decision-making, documentation, and follow-up. Consistent documentation, integration of electronic imaging, and recall systems can be used regularly to help achieve diagnostic consistency, omission reduction, and continuity of care. [29] Clinical advantages that can be achieved through the utilisation of simple or even administrative EHS functions may not be realised by dentists who depend solely on these benefits.

Furthermore, a common use of EHS may support the reflective practice through allowing a clinician to comprehend what he or she has done previously, track the outcomes, and discover ways of improvement. This is consistent with the recent focus on outcome-based and value-based models of dental care, in which practitioners are becoming more and more expected to have measurable quality and safety outcomes.[30]

6.2 Role of Training and Continuous Professional Development

The key facilitators of regular and efficient use of EHS are training and life-long professional development (CPD). It has been shown that insufficient training is a key factor that prevents the use of more advanced systems, which in most cases results in the failure to use all the clinical functions of the system, including decision support, standardised templates, and tracking outcomes [31]. The introductory training is not adequate, but continuous, role-specific CPD training is necessary to achieve long-term involvement and proficiency.

CPE programs in dental practice must lay more stress on the practical significance of EHS features, as well as technical navigational skills. There is a higher chance of promoting habitual use with training that directly relates EHS use to higher diagnostic accuracy, patient safety, and efficiency. Such support mechanisms as mentorship, peer learning, and feedback can also be used to strengthen positive usage behaviours and minimise opposition to digital workflows.[32]

6.3 Policy and Institutional Implications

Healthcare organisations are also at the centre stage when it comes to defining EHS usage trends at the institutional level. The usability, interoperability and clinical relevance policies would have a great impact on whether dentists or not use the EHS regularly or not. To match the real-life workflows, institutions are supposed to engage dental clinicians in the process of system selection, personalisation, and assessment [33].

Policy-wise, national digital health strategies, including Saudi Vision 2030 ones, must not be limited to just system deployment but also the system monitoring and outcome assessment policies. The systems of incentives, accreditation and quality frameworks that reward meaningful and frequent EHS use can also contribute towards the adoption of advanced functionalities. Notably, dentistry should be seen as a specialised area of clinical practice that requires its own documentation and imaging, and cannot be perceived as a continuation of general medicine.

6.4 Need for Standardised Outcome Metrics

One of the greatest obstacles to assessing the effects of the high use of EHS in the field of dentistry is the absence of standardised clinical outcome measures. It is challenging to compare the results of studies and settings because of the lack of consistent definitions and measurement strategies. Strong outcome assessment requires standardised indicators to assess clinical care outcomes, including diagnostic concordance rates, preventive services adherence, the rate of adverse events, and the completion of treatment schedules. [34]

Standardisation of outcomes is a requirement of high-quality digital documentation. Aggregating and benchmarking of data can be accomplished through structured data fields, standard coding practices and interoperability standards. The creation of consensus-based dental outcome frameworks would enhance research and quality improvement efforts and enable a better evaluation of the value created by regular EHS use.[35]

6.5 Recommendations for Future Research

The longitudinal study design and interventional study design should be considered in future research to more accurately determine the causal relationship between the frequency of EHS use and the clinical outcome of dental. The objective system-based measures, including frequency of logins, time spent in the clinical modules, and filled structured fields, would yield more precise results than self-reported usage. [35]

Interventional research that measures the effectiveness of a specific training program, usability improvement or policy incentive may also help better understand how to encourage the use of EHS frequently and effectively. Also, a wide range of practice settings should be involved in research, such as dentist work in the private-sector and in rural clinics, to enhance the generalizability. With digital dentistry still in its development, it will be necessary to incorporate the use of outcome measurement into normal practice to prove the actual clinical usefulness of EHS. Table 3 presents the practical and research implications concerning the common use of Electronic Health Systems in dental practice.

Table 3. Implications

Domain	Practical and Research Implications of Frequent EHS Use
Dental Practice	Frequent EHS use supports diagnostic accuracy, treatment planning, patient safety, and continuity of care.
Clinical Workflow	Routine use of structured documentation and integrated imaging improves efficiency and reduces redundancies.
Training & Professional Development	Continuous, clinically focused training is essential to promote advanced and consistent system use.
Institutional Policy	User-centred system design, interoperability, and clinician involvement enhance engagement and adoption.
Outcome Measurement	Standardised clinical outcome metrics are required to evaluate EHS effectiveness reliably.
Future Research	Longitudinal and interventional studies using objective usage data are needed to establish causal relationships.

Conclusion

This review notes that Electronic Health Systems have turned out to be a necessary tool in contemporary dental practice; though, its impact on clinical outcomes is hugely dependent on the rate and degree of utilisation and not merely the availability of systems. International literature has demonstrated that, when systematically and commonly exposed to EHS functions, including electronic dental records, digital imaging integration, clinical decision support, and recall systems, diagnostic accuracy, preventive care delivery, patient safety, and treatment efficiency have been linked to better delivery. Conversely, the clinical usefulness of these systems is restricted by infrequent or mostly administrative use. Indicators in Saudi Arabia indicate that there is a significant improvement in the adoption of EHS, which is due to national digital health programs and Vision 2030 changes. Implementation is high in public hospitals, academic hospitals and large healthcare organisations; though there are differences in training of users, usability of the system and institutional support, this leads to inconsistent levels of utilisation. As a result, significant changes in the dental clinical outcomes are not consistently realised. The results highlight the need to shift past adoption measures to outcome-based measurement of EHS use. Clinically, dentists are expected to be influenced to incorporate EHS in the daily decision-making, documentation, and follow-up processes. There should be continuous professional development programs that focus on clinical use and not just simple navigation of the system to encourage sustained and meaningful use. User-centred system design, interoperability and standardised documentation practices are some key enablers of good EHS utilisation at the policy and institutional level. Longitudinal and interventional studies based on objective system-generated data on usage and standardised data on dental outcome measures should be given priority in future research. The methodological gaps that are present will be necessary to achieve the causal relationship between common EHS use and better dental clinical outcomes. On the whole, EHS optimisation is one of the major opportunities to improve quality, safety, and value in dental care and do so in healthcare systems that are quickly growing more digital, such as Saudi Arabia.

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