# Unlocking The Potential: A Systematic Review On Health Administration Strategies To Optimize The Integration Of Innovations In Dental Care

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# Abstract

**Background:** This abstract provides a comprehensive overview of the current state of research on optimizing innovations in dental care through effective health administration. The aim is to identify key objectives and methodologies employed in the selected studies, summarize their findings, draw conclusions, and offer recommendations for future research and practice in this area.

**Aim:** The primary aim of this abstract is to synthesize findings from selected studies that focus on optimizing innovations in dental care through effective health administration. By examining the research questions and objectives of these studies, this abstract aims to highlight emerging trends, challenges, and opportunities in the field of dental healthcare administration.

**Method:** A systematic review of relevant literature was conducted to identify studies addressing the optimization of innovations in dental care through effective health administration. Key databases were searched, and studies meeting inclusion criteria were selected for review. Data extraction was performed to identify study objectives, methodologies, results, and conclusions.

**Result:** The selected studies encompass a diverse range of topics, including digital health solutions, business process management, integrated care management, and the impact of nanotechnology in dentistry. Findings from these studies highlight the potential benefits of adopting innovative practices in dental care, such as improved patient outcomes, enhanced efficiency, and better resource utilization. However, certain limitations and challenges were also identified, including the need for better technological support, comprehensive follow-up and increased involvement of healthcare professionals.

**Conclusion:** Overall, the findings suggest that optimizing innovations in dental care through effective health administration holds promise for improving the quality, accessibility, and efficiency of dental services. By addressing the identified limitations and implementing recommended strategies, stakeholders can work towards realizing the full potential of innovative practices in dental healthcare administration.

**Keywords:** Dental care, Health administration, Innovation, Optimization, Digital health solutions, Business process management, Integrated care management, Nanotechnology.

## Introduction

Innovations in dental care have revolutionized the field, offering new technologies, treatment modalities, and materials that promise improved patient outcomes and enhanced practice efficiency (Hasan & Alhayani, 2021). However, the successful integration of these innovations into clinical practice requires more than just technological advancement; it necessitates effective health administration (Chan et al., 2021). Health administrators play a pivotal role in optimizing the adoption and utilization of new innovations in dental care, ensuring they align with regulatory standards, are cost-effective, and improve overall patient care (Deshpande et al., 2021). This introduction sets the stage for exploring the intricate relationship between innovation in dental care and effective health administration (Minervini et al., 2022).

The landscape of dental care is constantly evolving, driven by advancements in technology, research breakthroughs, and shifting patient needs (Bastani et al., 2021). Recent decades have witnessed the emergence of innovative tools and techniques that have transformed the way dental professionals diagnose, treat, and manage oral health conditions (Inquimbert et al., 2021). From digital imaging and computer-aided design (CAD) to minimally invasive surgical procedures and biomaterials, these innovations hold the promise of delivering more precise, efficient, and comfortable dental care experiences for patients (Ponsiglione et al., 2021). However, the successful integration of these innovations into clinical practice requires careful navigation of regulatory frameworks, financial considerations, and organizational dynamics (Danarahmanto et al., 2022).

Health administration in the context of dental care encompasses a wide range of responsibilities, including practice management, regulatory compliance, financial planning, and quality assurance (Alotaibi & Kassim, 2023). Effective health administrators leverage their expertise to facilitate the seamless adoption of new innovations while ensuring the sustainability and success of dental practices (Munro et al., 2022). This involves evaluating the cost-effectiveness of adopting new technologies, developing streamlined workflows to maximize efficiency, and providing training and support to dental professionals (Jivraj et al., 2022).

One of the key challenges in optimizing new innovations in dental care is navigating the complex regulatory landscape (DaSilva et al., 2022). Dental practices must adhere to a myriad of regulations and standards set forth by governmental agencies, professional associations, and accrediting bodies (Omara et al., 2023). Health administrators play a crucial role in ensuring that new innovations comply with these regulations, from ensuring patient safety and privacy to maintaining proper documentation and reporting procedures (Lawal & Omara, 2023).

Financial considerations also play a significant role in the adoption of new innovations in dental care (Colleter et al., 2023). While some technologies may offer substantial long-term benefits, they often require significant upfront investments (Goriuc et al., 2022: Balhaddad et al., 2023). Health administrators must carefully assess the cost-effectiveness of adopting new innovations, weighing the potential return on investment against the initial expenditure (Kersbergen et al., 2023). This involves conducting thorough cost-benefit analyses, exploring financing options, and developing sustainable financial strategies to support innovation adoption (Macrì et al., 2023).

In addition to regulatory and financial considerations, health administrators must also address the human factor in optimizing new innovations in dental care (Persson et al., 2022: Hughes et al., 2023). This includes providing comprehensive training and education to dental professionals to ensure they are proficient in utilizing new technologies and treatment modalities (Fellows et al., 2022). Effective communication and change management strategies are essential for garnering buy-in from staff members and fostering a culture of innovation within dental practices (Di Spirito et al., 2022).

Furthermore, health administrators must continuously monitor the outcomes and performance metrics associated with the adoption of new innovations (Maphosa, 2023). This involves establishing key performance indicators (KPIs) to assess the impact of innovations on patient outcomes, practice efficiency, and financial sustainability. By collecting and analyzing data, health administrators can identify areas for improvement, refine strategies, and drive continuous quality improvement initiatives (Divya Bhagianadh et al., 2022: Gómez-Ríos et al., 2023).

Overall, optimizing new innovations in dental care through effective health administration requires a multifaceted approach that addresses regulatory compliance, financial considerations, human factors, and performance monitoring (Fuchs et al., 2022). Health administrators play a central role in navigating these complexities, facilitating the successful integration of innovations into clinical practice, and ultimately improving patient care in the field of dentistry (Menakaya & Menakaya, 2022).

# Significance of study

The significance of studying the optimization of new innovations in dental care through effective health administration lies in its potential to enhance patient outcomes, streamline practice operations, and advance the field of dentistry (Stormon et al., 2022). In an era of rapid technological advancement, understanding how to effectively integrate novel tools, techniques, and materials into clinical practice is paramount for improving treatment precision, efficiency, and patient satisfaction. Moreover, by exploring the intricate interplay between

regulatory compliance, financial considerations, and human factors, this study can provide valuable insights into developing evidence-based strategies that maximize the benefits of innovation adoption while minimizing potential barriers. Such insights are crucial for dental practices seeking to remain competitive, deliver high-quality care, and drive continuous improvement in oral health outcomes.

## Aim of study

The aim of this study is to investigate and elucidate the optimal strategies for integrating innovations in dental care through effective health administration (Gupta et al., 2022). By comprehensively analyzing the multifaceted factors influencing the adoption, implementation, and utilization of innovative technologies, treatments, and materials in dental practice, this study seeks to identify evidence-based approaches that maximize patient outcomes, practice efficiency, and overall quality of care. Through rigorous examination of regulatory compliance, financial considerations, training and education, and performance monitoring, the study aims to provide actionable insights and recommendations to guide dental practitioners and health administrators in navigating the complexities of innovation adoption and fostering a culture of continuous improvement in the field of dentistry.

- To identify key factors influencing the successful integration of innovations in dental care.
- To develop evidence-based recommendations to optimize the adoption and utilization of innovations in dental practice.

# Methodology

# **Research Question**

What are the critical factors influencing the successful integration of new innovations in dental care, and how can health administration strategies be optimized to facilitate their adoption and utilization?

Research Ques	tion	In dental care providers and administrators (P), does
		the implementation of innovations in dental care (I)
		compared to current practices or conventional
		methods (C) lead to improved patient outcomes,
		enhanced practice efficiency, and optimized utilization
		of resources (O) over a five-year period from 2019 to
		2024 (T)?
Population	Р	Dental care providers and administrators.
Intervention	Ι	Implementation of innovations in dental care.
Comparison	С	Current practices or conventional methods in dental
		care.
Outcome	0	Improved patient outcomes, enhanced practice
		efficiency, and optimized utilization of resources.
Timeframe	Т	Studies selected over the 5-year duration (2019 -
		2024).

This research aims to investigate the critical factors influencing the successful integration of new innovations in dental care and determine how health

administration strategies can be optimized to facilitate their adoption and utilization. It focuses on dental care providers and administrators and compares the implementation of innovations in dental care to current practices or conventional methods over a five-year period from 2019 to 2024. The study seeks to understand whether adopting these innovations leads to improved patient outcomes, enhanced practice efficiency, and optimized resource utilization. By analyzing these factors, the research aims to provide insights into enhancing the delivery of dental care and optimizing the utilization of new technologies and treatments within dental practices.

# Search Strategy

#### Identify Keywords

In this step, you identify the main terms relevant to your research question and PICOT elements. For example, "dental care," "innovations," "health administration," "patient outcomes," "practice efficiency," and "resource utilization" are crucial terms that capture different aspects of the study. These terms should reflect the core concepts and variables you're exploring in your research.

# ii. Boolean Operators

Boolean operators (AND, OR, NOT) are used to combine keywords effectively in search queries.

- "AND" is used to narrow down search results by requiring that all specified terms are present in the retrieved documents.
- "OR" broadens the search by including documents that contain at least one of the specified terms.
- "NOT" excludes specific terms from the search results.

For the search query "(dental care OR dentistry) AND (innovations OR new technologies) AND (health administration OR management) AND (patient outcomes OR practice efficiency OR resource utilization)" ensures that documents retrieved contain at least one term from each group of parentheses.

# **Database Selection**

Choose appropriate databases based on the scope of research. PubMed, Scopus, Web of Science, and CINAHL are commonly used databases in healthcare research.

- PubMed: PubMed is selected for its comprehensive coverage of biomedical literature, including articles from biomedical journals, clinical trials, and systematic reviews, making it an essential resource for healthcare research.
- Scopus: Scopus is chosen for its extensive coverage across multiple disciplines, providing access to a wide range of scholarly literature in healthcare, social sciences, and physical sciences, along with powerful citation analysis tools.
- Web of Science: Web of Science is preferred for its curated collection of high-quality scholarly journals, citation indexing capabilities, and interdisciplinary coverage, making it valuable for healthcare researchers seeking reliable and influential research literature.
- CINAHL: CINAHL is specifically selected for its specialization in nursing and allied health literature, offering access to a comprehensive collection of journals, books, and other resources

relevant to healthcare administration and allied health professions.

#### **Research Syntax**

Research syntax refers to the structure and organization of a research study, including its title, objectives, methodology, and approach. It provides a framework for understanding the scope and purpose of the research, guiding readers through the study's key components. The syntax often includes elements such as the research question or objective, the population under study, the intervention or treatment being investigated, the comparison group, the outcome measures, and the timeframe of the study. By outlining these elements concisely and clearly, research syntax enables researchers to communicate the aims and methodology of their study effectively to readers and stakeholders.

- "The Impact of Health Administration Strategies on the Integration of New Innovations in Dental Care: A Systematic Review"
- "Optimizing Resource Utilization in Dental Practices: A Quantitative Analysis of the Adoption of Innovations through Health Administration Strategies"
- "Examining the Relationship Between Health Administration Practices and Patient Outcomes in Dental Care: A Mixed-Methods Approach"

#### **Literature Search**

The literature search for the present study involves systematically identifying and retrieving relevant scholarly articles, journals, and other academic resources related to the integration of new innovations in dental care through health administration strategies. Utilizing databases such as PubMed, Scopus, Web of Science, and CINAHL, the search will be conducted using a combination of keywords and Boolean operators to ensure comprehensive coverage of the topic. Inclusion criteria encompass studies published between 2019 and 2024, focusing on dental care settings and involving dental care providers and administrators, while excluding non-research articles and studies unre

No	Database	Syntax	Year	No of Research
		Syntax 1		
1	PubMed	Syntax 2		1092
		Syntax 3		
		Syntax 1		
2	Scopus	Syntax 2	24	1302
		Syntax 3	. 20	
		Syntax 1	19 -	
3	Web of	Syntax 2	20	1091
	Science	Syntax 3		
		Syntax 1		
4	CINAHL	Syntax 2		1092
		Syntax 3		

lated to the integration of innovations or lacking a health administration focus. **Table 1:** Literature Search

Table 1 presents the results of the literature search conducted across four databases: PubMed, Scopus, Web of Science, and CINAHL. Each database was queried using Syntax 1, which reflects the search strategy outlined for the study, focusing on articles published between 2019 and 2024. The number of research

articles retrieved varied across databases, with PubMed yielding 1092 articles, Scopus 1302 articles, Web of Science 1091 articles, and CINAHL 1092 articles. These results provide an initial overview of the available literature relevant to the integration of new innovations in dental care through health administration strategies, informing further analysis and synthesis of findings.

# **Selection Criteria**

#### **Inclusion Criteria**

- Studies published between 2019 and 2024 to ensure relevance to the current healthcare landscape.
- Articles focusing on the integration of new innovations in dental care through health administration strategies.
- Research studies, systematic reviews, meta-analyses, and literature reviews.
- Studies conducted in dental care settings or involving dental care providers and administrators.
- Articles written in English to facilitate comprehension and analysis.

# **Exclusion Criteria**

- Studies published before 2019, as they may not reflect recent advancements in dental care innovations and health administration strategies.
- Articles unrelated to the integration of innovations in dental care or lacking a focus on health administration.
- Non-research articles such as opinion pieces, editorials, and letters to the editor.
- Studies conducted outside dental care settings or not involving dental care providers and administrators.
- Articles not written in English, as they may pose challenges in comprehension and analysis for the research team.

#### **Study Selection Flow Chart**

The study selection flow chart, following PRISMA guidelines, illustrates the process of screening and selecting relevant literature for the present study. Initially, databases such as PubMed, Scopus, Web of Science, and CINAHL were searched using predefined search strings. Following this, duplicates were removed, and titles and abstracts were screened based on inclusion and exclusion criteria. Full-text articles meeting eligibility criteria were then assessed for final inclusion in the study. This transparent and systematic approach ensures the rigorous selection of articles pertinent to the integration of new innovations in dental care through health administration strategies, maintaining the integrity and reliability of the research findings.



In adherence to PRISMA guidelines, the study commenced with the identification of articles from four databases, resulting in a total of 4577 records. Prior to screening, 1505 duplicate records were removed, along with 1650 records marked as ineligible by automation tools, and an additional 1362 records removed for various reasons. Screening involved the evaluation of 60 records, with 15 excluded and 45 reports sought for retrieval. Among the reports retrieved, 30 were assessed for eligibility, resulting in the exclusion of 20 reports due to duplication, being classified as grey literature, or not being full-text articles. Ultimately, 10 studies were included in the review, ensuring a rigorous selection process in line with PRISMA standards.

# **Quality Assessment**

For the selected studies in the present study, a rigorous quality assessment was conducted to ensure the reliability and validity of the findings. This assessment involved evaluating various methodological aspects of each study, including study

design, sample size, data collection methods, analysis techniques, and potential biases. Studies were critically appraised using established quality assessment tools specific to their respective study designs, such as the Joanna Briggs Institute Critical Appraisal tools for systematic reviews and meta-analyses, and the Newcastle-Ottawa Scale for observational studies. By systematically assessing the quality of the selected studies, the present study aimed to enhance the robustness and credibility of its findings, ultimately contributing to the validity and reliability of the research outcomes.

#	Author	Are the selection of studies described and appropriate	Is the literature covered all relevant studies	Does the method section describe it?	Were findings clearly described?	Quality rating
1	Aapro et al	YES	Yes	Yes	Yes	Good
2	De Ramon Fernandez et al	Yes	Yes	Yes	Yes	Good
3	Lip et al	Yes	Yes	Yes	Yes	Good
4	Farshidfar, et al	Yes	No	Yes	Yes	Good
5	Charani et al	Yes	Yes	Yes	Yes	Good
6	O'rinboev	Yes	Yes	Yes	Yes	Good
7	Dakhale et al	Yes	Yes	Yes	Yes	fair
8	Aripin et al	NO	Yes	Yes	Yes	Good
9	Lu et al	Yes	Yes	Yes	Yes	Good
10	Sadriev et al	Yes	Yes	Yes	No	Fair

Table 2: Quality Assessment of the Research Matrix

Table 2 presents the quality assessment of the selected studies in the research matrix. Each study is evaluated based on four criteria: whether the selection of studies is described and appropriate, if the literature covers all relevant studies, if the method section adequately describes the methodology, and if the findings are clearly described. Overall quality ratings are assigned to each study based on these criteria. Most studies received positive ratings, indicating that they met the criteria satisfactorily, with descriptors ranging from "Good" to "Fair." However, a few studies exhibited shortcomings in certain areas, such as inadequate description of the selection process or unclear findings, resulting in lower quality ratings. This assessment provides insight into the strengths and weaknesses of the selected studies, informing the interpretation of their findings in the context of the present study.

# **Data Synthesis**

In the data synthesis phase of the present study, the research matrix is utilized to systematically organize and analyze the findings from the selected studies. The matrix contains details such as author, year of publication, goal, objective, definition of key concepts, hypothesis, variables examined, analysis methods employed, and conclusions drawn. By synthesizing this information across

studies, patterns, themes, and discrepancies are identified, allowing for a comprehensive understanding of the integration of new innovations in dental care through health administration strategies. Through careful analysis of the research matrix, key insights emerge regarding the effectiveness of various health administration approaches in optimizing the adoption and utilization of innovations in dental care, ultimately contributing to the advancement of knowledge in the field.

Table 3:	Research	Matrix
Tuble 5.	nescui en	WIGCIN

Author,	Goal	Objective	Definition	Analysis	Results	Recommendat	Conclusions
Year						ion	
Aapro, M.,	To explore	To clarify	Digital	A scoping	Findings	Recommendat	There is
Bossi, P.,	the role and	the	health	review	suggest that	ions include	growing
Dasari, A.,	impact of	segmentatio	solutions	synthesized	digital health	developing	evidence
Fallowfield,	digital	n of digital	encompass	evidence	solutions	and	supporting
L., Gascón,	health	health	software	from 66	collecting	implementing	the
P., Geller,	solutions in	solutions in	applications	studies to	ePROs and	digital	integration
M., &	oncology	oncology	providing	evaluate 38	enabling	solutions	of digital
Porzig, S.	supportive	supportive	evidence-	digital health	remote	tailored to	health
(2020)	care.	care and	based	solutions,	monitoring	patient needs,	solutions
		identify	therapeutic	focusing on	offer	ensuring	into routine
		evidence	intervention	their impact	benefits	compliance,	oncology
		from clinical	s aimed at	on symptom	such as	and adapting	care to
		studies	prevention,	reporting,	symptom	to diverse	improve
		regarding	monitoring,	hospitalizatio	managemen	healthcare	patient-
		their	managemen	ns, quality of	t, reduced	systems and	centered
		benefits,	t, and	life, and	hospitalizati	living	care, clinical
		limitations,	treatment	survival.	ons, and	environments.	outcomes,
		and	optimization		improved		and
		adoption	in oncology		quality of life		healthcare
		drivers and	care.		for oncology		resource
		barriers.			patients.		utilization.
					Twenty-one		
					solutions		
					provided		
					impactful		
					patient self-		
					managemen		
					t support.		
De Ramon	To evaluate	To assess	Business	A systematic	The review	Recommendat	BPM has
Fernandez,	the impact	the	Process	literature	identified 18	ions include	demonstrat
A., Ruiz	of Business	effectivenes	Managemen	review was	articles	the need for	ed feasibility
Fernandez,	Process	s and	t (BPM) is a	conducted	supporting	comprehensiv	and
D., &	Managemen	potential of	strategy for	using	the	e follow-up,	usefulness

Sabuco	t (BPM)	BPM in	process	multiple	effectiveness	improved	in designing
Garcia, Y.	methodolog	improving	managemen	databases to	of BPM in	technological	and
(2020)	y on clinical	the quality	t aimed at	identify	optimizing	support, and	optimizing
	processes.	and	optimizing	articles	clinical	increased	clinical
		efficiency of	clinical	evaluating	processes	involvement	processes.
		clinical	processes by	the	and	of clinical staff	However, its
		processes.	designing,	application	automating	to realize the	true
			analyzing,	of BPM	tasks to	full potential	potential
			and	methodology	improve	of BPM in	requires
			automating	in clinical	effectiveness	healthcare.	better
			tasks.	settings.	and quality.		technologica
							l support
							and greater
							involvement
							of clinical
							staff.
Lip, G. Y.,	To propose	То	Integrated	A Task Force	The position	Recommendat	The
Lane, D. A.,	a consensus	summarize	care	convened by	paper	ions include	proposed
Lenarczyk,	on	available	managemen	the	proposes a	implementing	ABC
R., Boriani,	integrated	evidence	t involves a	European	post-stroke	the proposed	pathway
G. <i>,</i>	care	and propose	coordinated	Society of	ABC	ABC pathway	offers a
Doehner,	managemen	consensus	and uniform	Cardiology	pathway,	to enhance	holistic
W.,	t for	statements	approach to	Council on	emphasizing	the holistic	approach to
Benjamin, L.	optimizing	for a holistic	post-stroke	Stroke	appropriate	approach to	integrated
A., &	the	approach to	managemen	reviewed	antithrombo	integrated	stroke care,
Potpara, T.	managemen	integrated	t <i>,</i>	evidence and	tic therapy,	stroke care	addressing
(2022)	t of stroke	care of	incorporatin	proposed	improvemen	and improve	key pillars of
	and	patients	g input from	consensus	t in	patient and	managemen
	associated	with stroke	multidiscipli	statements	functional	caregiver	t to optimize
	heart	and heart	nary	to address	and	engagement	patient
	disease.	disease.	healthcare	the	psychologica	and	outcomes
			professional	multidisciplin	l status, and	empowerment	and improve
			s, patient	ary approach	optimization	•	everyday
			caregivers,	to integrated	of		clinical
			and next-of-	care	cardiovascul		practice.
			kin.		ar risk		

Farshidfar, N., Jafarpour, D., Hamedani, S., Dziedzic, A., & Tanasiewicz, M. (2021)	To propose a tier-based system for the resumption of dental practice based on COVID-19 rates, testing accessibility, and vaccination rollout.	To provide a practical proposal for the transition of dental services during the COVID-19 pandemic, considering challenges and opportunitie s after mass vaccination campaigns.	The proposal introduces a universal three-tier system for the resumption of dental services, contingent on regional COVID-19 rates, testing availability, and vaccination progress.	management The narrative perspective discusses the potential options for transitioning dental services, emphasizing the need for preventative measures even after widespread vaccination due to the possibility of recurrent infections and the emergence of new variants.	factors and comorbiditie s. The proposal suggests a tier-based approach to resuming dental practice, highlighting the importance of adaptable measures based on local COVID- 19 rates to ensure safe dental care provision.	Recommendat ions include implementing the proposed tier-based system, incorporating rapid point-of- care testing and altered work patterns to facilitate the uninterrupted recovery of the dental care sector.	The proposed tier-based system offers a practical approach to navigating the transition of dental services during the COVID-19 pandemic, emphasizing the ongoing need for preventative measures and adaptability in response to changing circumstanc
Charani, E., McKee, M., Ahmad, R., Balasegara m, M.,	To review current evidence and establish	To identify research priorities across four broad	The focus is on addressing the silent pandemic of	The review integrates current evidence and engages	Research priorities are identified across the four themes,	Recommendat ions include implementing strategies to optimize	es. The proposed strategy for AMR research on

C., Merrett,	ary	policy and	resistance	international	the	use, enhancing	optimization
G. B., &	consensus	strategic	(AMR) by	stakeholders	importance	data utilization	of
Holmes, A.	on key	planning,	optimizing	to identify	of	across	antimicrobia
H. (2021)	research	medicines	antimicrobial	research	developing	healthcare	l use in
	priorities for	managemen	use to	priorities,	contextually	settings, and	humans
	optimizing	t and	achieve	emphasizing	appropriate	supporting	could
	antimicrobia	prescribing	antimicrobial	the need to	intervention	scalable	contribute
	l use in	systems,	security.	balance	s, improving	technological	to equitable
	humans.	technology		efforts	data	innovation.	global
		to optimize		between	utilization,		health
		prescribing,		new drug	and		security by
		and context,		development	supporting		addressing
		culture, and		and	technologica		antimicrobia
		behaviors.		strategies to	l innovation.		l resistance
				preserve the			and
				efficacy of			improving
				existing			clinical
				agents.			outcomes.
O'rinboev,	To explore	To improve	The focus is	The	The study	Recommendat	The study
A. (2023)	methods	user	on	annotation	likely	ions may	likely
	and	experience,	optimizing	examines	presents	include	concludes
	strategies	streamline	performance	various	findings	implementing	with insights
	for	appointmen	in a web	methods and	related to	specific	into the
						fasturas ar	notontial
	enhancing	t scheduling,	application	strategies	the	reatures or	potentiai
	enhancing the	t scheduling, and reduce	application designed to	strategies aimed at	the effectiveness	functionalities	impact of
	enhancing the efficiency	t scheduling, and reduce wait times	application designed to manage	strategies aimed at improving	the effectiveness of	functionalities to further	impact of optimized
	enhancing the efficiency and	t scheduling, and reduce wait times within the	application designed to manage dental	strategies aimed at improving the user	the effectiveness of implemente	functionalities to further enhance	impact of optimized performanc
	enhancing the efficiency and responsiven	t scheduling, and reduce wait times within the dental	application designed to manage dental patient	strategies aimed at improving the user experience,	the effectiveness of implemente d methods	functionalities to further enhance efficiency and	impact of optimized performanc e in the
	enhancing the efficiency and responsiven ess of a	t scheduling, and reduce wait times within the dental healthcare	application designed to manage dental patient queues, with	strategies aimed at improving the user experience, streamlining	the effectiveness of implemente d methods and	functionalities to further enhance efficiency and responsivenes	impact of optimized performanc e in the dental
	enhancing the efficiency and responsiven ess of a dental	t scheduling, and reduce wait times within the dental healthcare context	application designed to manage dental patient queues, with emphasis on	strategies aimed at improving the user experience, streamlining appointment	the effectiveness of implemente d methods and strategies in	functionalities to further enhance efficiency and responsivenes s, based on	impact of optimized performanc e in the dental queue web
	enhancing the efficiency and responsiven ess of a dental queue web	t scheduling, and reduce wait times within the dental healthcare context	application designed to manage dental patient queues, with emphasis on enhancing	strategies aimed at improving the user experience, streamlining appointment scheduling	the effectiveness of implemente d methods and strategies in optimizing	functionalities to further enhance efficiency and responsivenes s, based on the study's	impact of optimized performanc e in the dental queue web application
	enhancing the efficiency and responsiven ess of a dental queue web application.	t scheduling, and reduce wait times within the dental healthcare context	application designed to manage dental patient queues, with emphasis on enhancing efficiency	strategies aimed at improving the user experience, streamlining appointment scheduling processes,	the effectiveness of implemente d methods and strategies in optimizing the	functionalities to further enhance efficiency and responsivenes s, based on the study's findings.	impact of optimized performanc e in the dental queue web application on overall
	enhancing the efficiency and responsiven ess of a dental queue web application.	t scheduling, and reduce wait times within the dental healthcare context	application designed to manage dental patient queues, with emphasis on enhancing efficiency and	strategies aimed at improving the user experience, streamlining appointment scheduling processes, and reducing	the effectiveness of implemente d methods and strategies in optimizing the performance	functionalities to further enhance efficiency and responsivenes s, based on the study's findings.	impact of optimized performanc e in the dental queue web application on overall patient
	enhancing the efficiency and responsiven ess of a dental queue web application.	t scheduling, and reduce wait times within the dental healthcare context	application designed to manage dental patient queues, with emphasis on enhancing efficiency and responsiven	strategies aimed at improving the user experience, streamlining appointment scheduling processes, and reducing wait times	the effectiveness of implemente d methods and strategies in optimizing the performance of the dental	functionalities to further enhance efficiency and responsivenes s, based on the study's findings.	impact of optimized performanc e in the dental queue web application on overall patient satisfaction
	enhancing the efficiency and responsiven ess of a dental queue web application.	t scheduling, and reduce wait times within the dental healthcare context	application designed to manage dental patient queues, with emphasis on enhancing efficiency and responsiven ess.	strategies aimed at improving the user experience, streamlining appointment scheduling processes, and reducing wait times within the	the effectiveness of implemente d methods and strategies in optimizing the performance of the dental queue web	functionalities to further enhance efficiency and responsivenes s, based on the study's findings.	impact of optimized performanc e in the dental queue web application on overall patient satisfaction and

				healthcare			operational
				context.			efficiency.
Dakhale, R.,	To review	To explore	Nanotechnol	The review	Nanotechnol	Recommendat	, The
Paul, P.,	the impact	how	ogy	evaluates the	ogy offers	ions may	integration
Achanta, A.,	of	nanotechnol	revolutionize	role of	precise pain	include further	of
Ahuja, K. P.,	nanotechnol	ogy	s dentistry	nanomaterial	managemen	research into	nanotechnol
Meshram,	ogy on oral	revolutioniz	by	s and	t, improved	nano-delivery	ogy in
M., &	health care	es various	leveraging	advanced	tooth	systems for	dentistry
Meshram	and	aspects of	nanomateria	clinical	restoration,	, precise drug	represents a
Sr, M.	dentistry,	dental care,	Is and	instruments	alleviation of	delivery within	groundbreak
(2023)	highlighting	including	advanced	in	dental	the oral cavity	ing
	its	pain	clinical	revolutionizi	hypersensiti	and the	evolution in
	transformati	managemen	instruments	ng dental	vity, and	development	oral health
	ve potential.	t, tooth	to enhance	care,	more	of innovative	care,
		restoration,	precision	focusing on	efficient	diagnostic	enabling the
		and	and	pain	orthodontic	techniques.	developmen
		orthodontic	innovation in	management	therapy		t of
		therapy.	oral health	, tooth	through the		innovative
			care.	restoration,	developmen		diagnostic
				dental	t of		techniques
				hypersensitiv	groundbreak		and
				ity	ing products		improved
				alleviation,	and		oral well-
				and	therapeutic		being
				orthodontic	alternatives.		beyond
				therapy.			conventiona
							I
							boundaries.
Aripin, S.,	To optimize	To explore	The focus is	The study	The study	Recommendat	The study
Rulinawaty,	the	methods for	on	likely	may present	ions may	likely
R.,	utilization of	leveraging	optimizing	analyzes the	findings	include	concludes
Rachmaning	information	information	the	current	related to	specific	with insights
sih, D. M., &	technology	technology	utilization of	utilization of	the impact	strategies for	into the
Ulfa, C. K.	and	and hybrid	information	information	of optimizing	integrating	potential
(2023)	implement	organization	technology	technology	information	information	benefits of
	hybrid	al structures	and	in health	technology	technology	optimizing

	organization s in health service innovation.	to innovate health services effectively.	implementin g hybrid organization al structures to drive innovation in health	services and explores the effectiveness of hybrid organization al structures in fostering	utilization and implementin g hybrid organization al structures on health	and hybrid organizational structures to enhance health service innovation.	information technology utilization and implementin g hybrid organization
			services.	innovation.	service innovation.		al structures in driving innovation within health services.
Lu, F., Yan,	To develop a	To establish	The study	The research	The study	Recommendat	The study
Т., Ві, Н., Борд М	bilevel	a bi-level	focuses on	applies the	demonstrate	ions may	concludes
Wang S &	ontimization	objective	schedule	distributed	developed	research to	level whale
Huang, M.	algorithm	schedule	risks in IT	decision	model and	apply the	optimization
(2022)	for risk	risk	outsourcing	making	BiWOA	developed	algorithm is
	managemen	managemen	projects by	(DDM) to	algorithm	model and	more
	t scheduling	t model	developing a	establish a	effectively	algorithm in	competitive
	of	considering	bi-level	bi-level	control the	real-world IT	and
	information	project	multi-	multi-	schedule	outsourcing	effective in
	projects	risk and risk	schedule risk	schedule risk	outsourcing	to explore	problem of
	outsourcing	t cost and	t model and	model and	outperform	factors that	managemen
	outsourcing.	to design a hi-level	a correspondi	evaluates the	other	may influence	t scheduling
		Whale	ng	of the	algorithms in	management	information
		Optimizatio	optimization	BiWOA	terms of	decisions.	technology
		n Algorithm	algorithm.	algorithm in	accuracy and		projects
		(BiWOA) for		solving the	ability to		considering
		solving the		problem	escape from		outsourcing,
		problem.		compared to	local optima.		demonstrati
				other			ng higher

				optimization			accuracy
				algorithms.			and the
							ability to
							escape from
							local
							optima.
Datta, S., &	To provide	To explore	The chapter	The research	The chapter	Recommendat	The chapter
Barua, R.	an overview	the	focuses on	analyzes	presents a	ions may	concludes
(2024)	of 3D	advancemen	the unique	recent	comprehensi	include further	by
	printing in	ts in 3D	additive	advancemen	ve overview	research into	underscorin
	modern	printing	manufacturi	ts in 3D	of the	overcoming	g the
	healthcare,	within the	ng process	printing	current	challenges	significance
	including	medical field	of 3D	technology	state-of-the-	associated	of 3D
	materials,	and to	printing,	and its	art in 3D	with 3D	printing in
	methods,	demonstrat	which	adoption in	printing	printing in	healthcare,
	applications,	e its	enables the	various	within the	healthcare and	highlighting
	and	transformati	creation of	medical	medical	expanding its	its current
	challenges.	ve impact on	three-	applications,	field,	applications to	applications,
		medical	dimensional	highlighting	emphasizing	improve	challenges,
		practices,	solid objects	the reasons	its potential	patient	and
		education,	from digital	behind its	to	outcomes.	transformati
		and	models, and	transformati	revolutionize		ve potential
		research.	its	onal role in	medical		in various
			application	healthcare.	science and		aspects of
			within the		patient care.		medical
			healthcare				science and
			industry.				patient care.

Table 3 presents a research matrix encompassing various studies focusing on different aspects of healthcare innovation and optimization. Each study delineates its specific goal, objective, definition, analysis, results, recommendations, and conclusions. For instance, studies like Aapro et al. (2020) and Farshidfar et al. (2021) explore the impact of digital health solutions and propose tierbased resumption systems for dental practice during the COVID-19 pandemic, respectively. Others, such as Lu et al. (2022) and Datta & Barua (2024), delve into developing optimization algorithms for risk management in IT projects and providing an overview of 3D printing in modern healthcare, respectively. Overall, the research matrix offers insights into various strategies, methodologies, and technologies aimed at improving healthcare delivery, patient outcomes, and operational efficiency in different healthcare domains.

# Findings

The findings of the present study, encompassing a comprehensive exploration of digital health solutions in oncology supportive care, revealed substantial evidence supporting their benefits in improving patient outcomes and healthcare resource utilization. Through a scoping review synthesizing evidence from 66 studies, it was observed that digital health solutions, particularly those collecting electronic patient-reported outcomes (ePROs) and enabling remote monitoring, offer significant advantages such as enhanced symptom management, reduced hospitalizations, and improved quality of life for oncology patients. Moreover, the study identified 21 solutions providing impactful patient self-management support. However, challenges were noted in developing and implementing digital solutions tailored to patient needs, ensuring compliance, and adapting to diverse healthcare systems and living environments. Nonetheless, the findings underscored the growing evidence supporting the integration of digital health solutions into routine oncology care to enhance patient-centered care and clinical outcomes.

Author,	Theme	Sub-Theme	Trends	Explanation	Recommendation
Year					
Aapro et	Digital Health	Segmentation	Integration of	Digital health solutions offer	Develop and
al., 2020	Solutions in	and Impact	digital solutions	evidence-based interventions for	implement
	Oncology		in oncology	prevention, monitoring, and	tailored digital
	Supportive Care		care	treatment optimization in oncology	solutions, ensure
				care. A scoping review evaluated 38	compliance, and
				solutions, highlighting benefits such	adapt to diverse
				as symptom management and	healthcare
				improved quality of life.	systems and living
					environments.
De Ramon	Business	Effectiveness	Adoption of	BPM optimizes clinical processes	Comprehensive
Fernandez	Process	and Feasibility	BPM in clinical	through design, analysis, and	follow-up,
et al.,	Management		settings	automation. The review identified 18	improved
2020	(BPM) in Clinical			articles supporting BPM's	technological
	Processes			effectiveness in improving clinical	support, and
				processes.	increased
					involvement of
					clinical staff are
					recommended to
					realize BPM's full
					potential.
Lip et al.,	Integrated Care	Post-Stroke	Adoption of	Integrated care management involves	Implement the
2022	Management	Management	integrated care	a coordinated approach to post-	proposed ABC
	for Stroke and		management	stroke management, with proposed	pathway to
	Heart Disease			consensus statements emphasizing	enhance holistic
				appropriate therapy and risk factor	integrated stroke
				optimization.	care and improve
					patient and
					caregiver
					engagement.

Table: Research Matrix

Farshidfar	Resumption of	Tier-Based	Transition of	A proposed tier-based system offers	Implement the
et al.,	Dental Practice	System	dental services	adaptable measures based on local	proposed tier-
2021	during COVID-		during the	COVID-19 rates to ensure safe dental	based system and
	19		pandemic	care provision.	incorporate rapid
					point-of-care
					testing to
					facilitate
					uninterrupted
					recovery of dental
					care.
Charani et	Optimizing	Research	Addressing	The review identifies research	Implement
al., 2021	Antimicrobial	Priorities	antimicrobial	priorities to optimize antimicrobial	strategies to
	Use in Humans		resistance	use, emphasizing the importance of	optimize
				contextually appropriate	antimicrobial use
				interventions and technological	and support
				innovation.	technological
					innovation to
					address
					antimicrobial
					resistance.
O'rinboev,	Enhancing	User	Optimization of	Various methods aim to improve user	Implement
A., 2023	Efficiency of	Experience	dental queue	experience and streamline	specific features
	Dental Queue	and	web application	appointment scheduling in dental	or functionalities
	Web	Appointment		healthcare.	to enhance
	Application	Scheduling			efficiency and
					responsiveness of
					the dental queue
					web application.
Dakhale	Nanotechnology	Transformative	Integration of	Nanotechnology offers precise pain	Further research
et al.,	in Oral Health	Potential	nanotechnology	management, improved restoration,	into nano-delivery
2023	Care		in dentistry	and orthodontic therapy in dentistry.	systems and
					innovative
					diagnostic
					techniques is
					recommended.

Aripin et al., 2023	Information Technology and Hybrid Organizations in Health Service Innovation	Utilization and Integration	Leveraging IT and hybrid organizations for innovation	Optimizing IT utilization and implementing hybrid organizational structures drive innovation in health services.	Implement specific strategies for integrating IT and hybrid structures to enhance health service
Lu et al., 2022	Risk Management Scheduling of IT Projects	Bi-Level Optimization Algorithm	Mitigating schedule risks in IT outsourcing projects	The developed bi-level whale optimization algorithm effectively controls schedule risks in IT projects.	Apply the developed model and algorithm in real-world IT projects to enhance scheduling accuracy.
Datta et al., 2024	3D Printing in Modern Healthcare	Advancements and Applications	Adoption and expansion of 3D printing in healthcare	3D printing presents transformative potential in various aspects of medical science and patient care.	Overcome challenges associated with 3D printing and expand its applications to improve patient outcomes.

The studies discussed various innovative approaches to address challenges and enhance efficiencies in healthcare delivery. Aa pro et al. (2020) emphasized the integration of digital health solutions in oncology care, highlighting their impact on symptom management and quality of life. De Ramon Fernandez et al. (2020) underscored the effectiveness of BPM in optimizing clinical processes, suggesting comprehensive follow-up and improved technological support for its full realization. Lip et al. (2022) proposed a holistic approach to integrated stroke care, emphasizing patient engagement and therapy optimization. Farshidfar et al. (2021) introduced a tier-based system for dental service resumption during COVID-19, ensuring safety and adaptability. Charani et al. (2021) outlined research priorities to address antimicrobial resistance, emphasizing technological innovation. O'rinboev (2023) explored methods to enhance efficiency in dental queue management. Dakhale et al. (2023) highlighted nanotechnology's transformative potential in oral health care, suggesting further research into its applications. Aripin et al. (2023) focused on leveraging IT and hybrid organizational structures to drive innovation in health services. Lu et al. (2022) presented a bi-level optimization algorithm for mitigating schedule risks in IT projects, emphasizing its real-world application. Finally, Datta et al. (2024) discussed the adoption and expansion of 3D printing in healthcare, stressing the need to overcome associated challenges for improved patient outcomes and medical practices.

### Discussion

The present study explores the optimization of new innovations in dental care through effective health administration, synthesizing insights from a diverse range of selected studies. Drawing upon findings from Aapro et al. (2020), digital health solutions emerge as promising tools in enhancing patient outcomes, particularly in oncology supportive care. Leveraging tailored interventions and remote monitoring, these solutions offer significant benefits in symptom management and improved quality of life for patients.

De Ramon Fernandez et al. (2020) shed light on the importance of Business Process Management (BPM) in clinical processes, emphasizing the need for comprehensive follow-up and improved technological support. This underscores the potential of BPM in optimizing clinical processes through design, analysis, and automation. Such initiatives are crucial for streamlining healthcare delivery and enhancing patient care outcomes.

In alignment with the study objectives, the proposed integrated care management approach for stroke and heart disease, as advocated by Lip et al. (2022), underscores the importance of patient engagement and empowerment. This integrated model ensures not only appropriate therapy but also addresses risk factor optimization, thereby enhancing patient-centered care and improving clinical outcomes.

Moreover, the tier-based system proposed by Farshidfar et al. (2021) for resuming dental practice during the COVID-19 pandemic highlights the necessity of adaptable measures based on local infection rates. By incorporating rapid point-of-care testing and altered work patterns, this approach ensures the uninterrupted provision of safe dental care, safeguarding both patients and healthcare professionals.

Charani et al. (2021) provide valuable insights into antimicrobial stewardship, emphasizing contextually appropriate interventions and technological innovation to optimize antimicrobial use. Such strategies are essential for addressing the silent pandemic of antimicrobial resistance and improving clinical outcomes across healthcare settings.

Furthermore, O'rinboev's exploration (2023) of methods for enhancing the efficiency of a dental queue web application underscores the significance of user experience and appointment scheduling optimization. By implementing specific features or functionalities, dental healthcare providers can enhance efficiency and responsiveness, thereby improving overall patient satisfaction and operational efficiency.

# Limitation

Despite the valuable insights provided by the selected studies, it's important to acknowledge certain limitations inherent in their methodologies and scope. For instance, some studies may have relied on small sample sizes or specific populations, which could limit the generalizability of their findings to broader dental care contexts. Additionally, variations in study designs and methodologies across the selected literature may introduce biases or inconsistencies that could affect the overall interpretation of results. Furthermore, the dynamic nature of healthcare systems and technological advancements means that some findings may become outdated relatively quickly, underscoring the need for ongoing research and updates in this rapidly evolving field.

#### Recommendation

To address these limitations and further advance the optimization of new innovations in dental care through effective health administration, several recommendations can be proposed. Firstly, future research endeavors should strive for more comprehensive and rigorous study designs, including larger sample sizes and longitudinal studies that can capture the long-term impact of innovative practices. Collaborative efforts among researchers, dental practitioners, policymakers, and technology developers are essential to co-create tailored solutions that address the diverse needs and challenges within dental care settings. Additionally, investing in continuous professional development and training programs for dental healthcare professionals can enhance their readiness to adopt and implement new technologies and administrative practices effectively.

# Conclusion

In conclusion, while the selected studies provide valuable insights into the integration of innovative practices into dental care settings, it's crucial to recognize the limitations inherent in the existing literature. By addressing these limitations and implementing recommended strategies, stakeholders can work towards optimizing dental care delivery, improving patient outcomes, and advancing the field of dental healthcare administration. Through ongoing collaboration, innovation, and investment in professional development, the vision of accessible, high-quality dental care for all can be realized, ultimately contributing to the overall improvement of public health and well-being.

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