



University of Midocean

Faculty of Administration

Department of Health Administration

Research title :

**Knowledge, Attitudes, and
Barriers toward Implementing CBAHI
standards among Dental Practitioners in Saudi
Arabia**

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2026

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Dedication

This thesis is dedicated with deepest
gratitude to my husband, for his
support, patience, and encouragement
throughout this journey.

To my precious daughters, Jood and
Noor, your love is my constant
motivation and the true driving force
behind everything I strive to
accomplish.

To my father, for teaching me
perseverance and determination, and
to my mother, for her boundless love
and guidance.

To my dear siblings and my friends,
for their continuous support
encouragement and generosity, which
have contributed greatly to the
completion of this work.

Acknowledgement

First and foremost, all gratitude and praise are due to Allah, my Creator, for His infinite mercy and continuous blessings throughout this academic journey.

I sincerely thank my family and friends for their unwavering support, patience, and encouragement, which made every challenge surmountable.

My heartfelt appreciation goes to my doctors and mentors for their invaluable guidance, constructive advice, and support, which have greatly shaped this research.

Finally, I am grateful to Midocean University for providing an enriching academic environment and the resources necessary to complete this Master's thesis.

Abstract

This study aimed to assess the level of knowledge, attitudes, and perceived barriers toward the Central Board for Accreditation of Healthcare Institutions (CBAHI) standards among dental practitioners in the Kingdom of Saudi Arabia.

The study population consisted of all dental practitioners working in governmental and private sectors across Saudi Arabia .

Data were collected through a convenience sample of dental practitioners using an electronic questionnaire.

The results revealed a moderate level of knowledge and moderate attitudes toward the implementation of the standards, accompanied by moderate to high perceived barriers.

The study demonstrated a strong positive relationship between knowledge and attitudes, with knowledge emerging as the strongest predictor of attitudes. The findings indicated that years of professional experience had a significant positive effect on the level of knowledge of CBAHI standards, whereas formal training showed no statistically significant impact on knowledge or attitudes, suggesting the need to review the content and delivery methods of current training programs.

The study recommends redesigning training programs to be more practical, strengthening management and leadership support, addressing resource shortages, simplifying the standards and improving communication methods, integrating CBAHI standards into dental school curricula, and implementing change management strategies while involving practitioners in decision-making processes. These steps aim to enhance knowledge levels and more effectively overcome the barriers to implementing the mandatory CBAHI standards.

Keywords: CBAHI standards, Knowledge, Attitudes, Barriers, Dental practitioners, Healthcare accreditation, Saudi Arabia.

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Chapter 1

Introduction

1.1 Introduction

Healthcare quality and patient safety are fundamental pillars of modern health systems around the world. Healthcare institutions always work to follow established standards that guide their operations. These standards help them provide medical services that are safe, effective, and patient centered.

Accreditation programs play a vital role by providing a structured approach to assess whether these standards are being met.

In the Kingdom of Saudi Arabia, the healthcare sector has undergone significant transformation under Vision 2030 and healthcare quality being a top priority while accreditation has become a primary method to ensure that all healthcare facilities meet the same high standards of care .

The Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI) is a national governmental body under the Saudi Health Council that aims to ensure the quality and safety of healthcare services in Saudi Arabia. It supports healthcare facilities through developing unified standards, conducting evaluations, and granting accreditation[1].

CBAHI was first introduced in 2001 as a quality improvement initiative in the Makkah region. Due to its success, it was later expanded to cover all healthcare institutions across the Kingdom and became a national accreditation body[1].

In 2013, a Council of Ministers decision officially established CBAHI in its current form and made accreditation mandatory for healthcare institutions to ensure consistent quality of care[1].

“CBAHI standards and accreditation have a positive impact on the quality of healthcare services and patient safety across various medical sectors in Saudi Arabia” [2]. These programs help make healthcare organizations more accountable, improve their performance, and foster a culture of continuous quality improvement.

Recent research by Alsuhaimi et al. (2025) highlighted that “the positive impact of CBAHI standards and accreditation requirements has been felt in various Saudi Arabian settings and locations,” emphasizing their role in improving institutional performance [3].

The dental care sector represents an important and sensitive part of the healthcare system. Dental treatments must be performed carefully and adhere to strict standards for infection control and risk management [4].

Dental clinics may appear to be low risk environments, yet they involve many procedures that expose both patients and practitioners to blood and aerosols, which increases the risk of infection transmission. So applying quality and safety standards is very important in daily dental practice[5].

After the COVID-19 pandemic, more attention has been given to infection control, especially in dental settings. However, even with this increased awareness, not all practitioners may apply these standards consistently.

Dental practitioners may face challenges in implementing standards due to factors such as workload, limited time, lack of training or workplace conditions[6].

Another important point is how practitioners perceive CBAHI standards. Some may see them as a helpful guide to improve patient safety and quality of care, while others may consider them mainly as requirements for accreditation rather than something to follow in everyday practice. This difference in perception can affect how well these standards are applied [7].

In addition, differences in experience and work settings may also influence practice. For example, younger dentists may be more familiar with updated guidelines, while more experienced practitioners may depend more on their routine. Also, working in private clinics may involve different pressures compared to public clinics[8].

Although the dental sector plays a major role in healthcare, there are still limited studies that focus on the knowledge, attitudes, and barriers related to the implementation of CBAHI standards among dental practitioners in Saudi Arabia, what they know about CBAHI standards, how they feel about them, and what specific difficulties they face in following them[9].

Therefore, this study aims to explore these aspects and provide a clear understanding and provide valuable insights that can help improve compliance and further enhance patient safety within Saudi Arabia's rapidly evolving healthcare landscape and improve the quality of dental care.

1.2 Problem Statement

Dental care environments are uniquely high risk settings within the healthcare system. Unlike many other medical fields, dental procedures frequently involve aerosol generating procedures, the use of sharp instruments, and close face to face proximity between practitioners and patients. Combined with rapid patient turnover, these factors significantly increase the potential for cross-contamination and the transmission of infections. Therefore, strict adherence to the highest standards of infection control and patient safety is not merely a recommendation but an absolute necessity in dentistry.

While Saudi Arabia, under Vision 2030, has implemented CBAHI standards, including specific National Standards for Dental Centers (2022), ensuring consistent and effective compliance within this sensitive sector remains a critical challenge [2, 3, 4].

Despite the proven positive impact of CBAHI accreditation across general healthcare, a significant knowledge gap persists regarding its specific application in dentistry [3, 4]. Limited empirical evidence exists on how dental practitioners, the frontline implementers perceive these standards, understand them, or the practical barriers they face [4]. This oversight is crucial because any divergence between policy and practice in such a high-risk environment may directly compromise patient safety through potential cross-contamination and healthcare associated infections, thereby affecting the consistent quality of dental services [5].

Therefore, this study is essential to explore dental practitioners' awareness, attitudes, and perceived challenges regarding CBAHI standards. Its findings will identify areas for improvement, supporting more effective implementation and ultimately enhancing patient safety and quality of care in Saudi Arabia.

1.3 Study Importance

This study has both scientific and practical importance, as it addresses an important aspect of healthcare quality in Saudi Arabia, particularly the implementation of CBAHI standards in dental clinics.

Scientific Significance

This study contributes to enriching knowledge in the field of healthcare quality and accreditation standards, particularly in dental practice.

While several studies have examined the implementation of CBAHI standards in healthcare institutions in general, only a limited number have focused specifically on dental clinics. Most of the available research in dental settings mainly focuses on infection control, while other important aspects of quality and safety receive less attention[6].

Dental clinics represent unique clinical environments that involve several risks, such as the use of sharp instruments, exposure to radiation from dental imaging, administration of medications and local anesthesia, and close contact between dentists and patients. In addition to infection control, implementing accreditation standards in dental clinics also involves important elements such as patient safety, proper clinical documentation, medication safety, risk management, and emergency preparedness[5].

Therefore, this study helps fill a gap in the literature by examining dental practitioners' knowledge, attitudes, and perceived barriers related to the implementation of CBAH standards.

It also contributes to a better theoretical understanding of how healthcare professionals' knowledge and attitudes may influence their adherence to quality and safety standards.

Practical Significance

From a practical standpoint, this study offers direct benefits for improving dental care in Saudi Arabia. The findings can help dental clinics and health institutes understand the real world challenges that dentists face when trying to apply CBAHI standards.

This information is very useful for creating better training programs that are designed specifically for the needs of dental professionals. By identifying the main problems, this study can guide policymakers, like the Ministry of Health and CBAHI, in making more effective rules and support systems. Ultimately, this will lead to safer dental practices, better patients outcomes, and a stronger culture of quality and safety in dental care across the Kingdom.

1.4 OBJECTIVES

General Objective :

To identify the knowledge, attitude, and barriers toward implementing CBAHI standards among dental practitioners in Saudi Arabia.

Specific Objective :

1. To evaluate the level of knowledge among dental practitioners regarding CBAHI accreditation standards.

2. To assess their attitudes toward implementing these standards in dental practice.
3. To assess the barriers that hinder effective implementation of CBAHI among dental practitioners.
4. To propose recommendations to improve awareness, compliance, and training with CBAHI standards in dental clinics.

1.5 Study Questions

1. What is the level of knowledge among dental practitioners in Saudi Arabia toward CBAHI standards ?
2. What are the attitudes of dental practitioners toward implementing CBAHI standards in the daily practice ?
3. What are the main barriers that faced the dental practitioners in applying CBAHI standards ?
4. Are there associations between demographic characteristics like years of expertise, job position and practitioners's knowledge, attitudes, and barriers?
5. What are the best interventions to improve awareness and compliance with CBAHI standards?

1.6 Hypotheses of the Study

Main Hypothesis :

There is a statistically significant relationship between dental practitioners' knowledge and attitudes toward CBAHI standards and the level of implementation of these standards in dental clinics in Saudi Arabia.

Null Hypothesis (H0):

There is no statistically significant relationship between dental practitioners' knowledge and attitudes and the implementation of CBAHI standards in dental clinics in Saudi Arabia.

Alternative Hypothesis (H1):

There is a statistically significant relationship between dental practitioners' knowledge and attitudes and the implementation of CBAHI standards in dental clinics in Saudi Arabia.

Sub-Hypotheses :

H1: There is a statistically significant relationship between dental practitioners' knowledge of CBAHI standards and their attitudes toward implementing these standards in dental clinics in Saudi Arabia.

H2: There is a statistically significant relationship between years of professional experience and the level of knowledge of CBAHI standards among dental practitioners in Saudi Arabia.

H3: There is a statistically significant relationship between demographic and professional factors (such as job position) and dental practitioners' attitudes toward the implementation of CBAHI standards.

H4: There is a statistically significant relationship between perceived barriers (such as lack of time and lack of training) and the implementation of CBAHI standards in dental clinics.

H5: Increasing awareness and training programs is associated with improved implementation of CBAHI standards among dental practitioners in Saudi Arabia.

1.7 Study Model

This study adopts across-sectional descriptive analytical framework to assess the levels of knowledge, attitudes, and perceived barriers related to the implementation of CBAHI standards among dental practitioners in Saudi Arabia.

Study Variables :

- Knowledge of CBAHI standards among dental practitioners.
- Attitudes toward CBAHI standards among dental practitioners.
- Perceived barriers to implementation among dental practitioners.

Outcome Variable :

Level of implementation of CBAHI standards in clinical practice among dental practitioners.

CHAPTER 2

Literature Review

2.1 Introduction

The Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI) sets mandatory standards to ensure quality and patient safety in all healthcare facilities, including dental clinics. These standards cover key areas like patient safety, infection control, risk management, staff competency, medical records, and quality systems.

Successful implementation depends on dental practitioners' knowledge, attitudes, and the barriers they face, such as lack of training, limited resources, or heavy workload. Previous studies in Saudi healthcare settings show knowledge and attitudes vary, and practical obstacles often limit compliance[6].

This chapter reviews the literature on three main topics:

- Knowledge of accreditation standards in dentistry.
- Attitudes toward accreditation and quality care among dental practitioners.
- Barriers to applying the standards.

The main research gap is the limited focus on dentists in Saudi Arabia, highlighting the need for this study.

Dependent Variable

Implementation of CBAHI Standards, the extent to which dental practitioners apply accreditation standards in their daily practice

Independent Variables

Knowledge of CBAHI standards among the practitioners in Saudi Arabia.
Attitudes toward accreditation and quality care , their perceptions and opinions about accreditation and quality of care, and Barriers to implementation ,factors that hinder full compliance with the standars

2.2 Discussion of Literature Review

1. Implementation Impact in Primary Care Dental Clinics

Evaluating the impact of applying infection control standards for CBAHI program in dental clinics in primary healthcare centers, Makkah, Saudi Arabia.

Reference: Alghamdi, S., et al. (2021).

Objective: To assess how CBAHI accreditation affects the quality of infection control in government dental clinics.

Methodology: A descriptive study using standardized observation checklists across several clinics.

Key Results: Accreditation significantly improved sterilization and waste management. However, compliance was inconsistent in clinics with high patient turnover.

Relationship and Critique: This study proves that CBAHI works at a structural level but fails to explain the human element and why practitioners in busy clinics struggle. This research fills in by looking at barriers like workload.

2. Implementation Impact on Infection Control Practices .

Compliance of Dental Health Care Providers on Infection Control Standard Precautions Guidelines in Primary Health Care Centers, Makkah, Saudi Arabia.

Reference: Bandugh, B., et al. (2021)

Objective: To evaluate adherence to infection control standards (aligned with CBAHI domains) among dental providers in primary care settings.

Methodology: Cross-sectional survey combined with observational assessment in primary health care centers in Makkah.

Key Results: Moderate to good compliance in sterilization and PPE use, but gaps persisted in consistent application due to workload, training variability, and resource shortages.

Relationship and Critique: This study shows partial success in implementing CBAHI related infection prevention in dentistry but does not address broader attitudes or knowledge gaps.

This research extends the scope by examining knowledge, attitudes, and barriers toward full CBAHI standards among dental practitioners.

3. Implementation Impact on Patient Safety Dimensions

Impact of the CBAHI accreditation program on the Institute of Medicine's safety dimensions in Madinah hospitals.

Reference: Alsaedi, A., et al. (2023).

Objective: To measure the effect of CBAHI accreditation on patient safety indicators and care processes.

Methodology: Comparative pre and post accreditation analysis using safety metrics and facility audits.

Key Results: Accreditation improved safety culture, incident reporting, and process adherence; however, sustained improvements were challenged by resource limitations and leadership issues.

Relationship and Critique: The study confirms positive systemic effects of CBAHI on quality and safety, but it remains hospital focused and lacks dentistry specific insights. This research addresses this gap by investigating practitioner level factors in dental settings.

4. Implementation Impact and Provider Perceptions

Perceptions, attitudes, and barriers towards the use of CBAHI standards among Saudi healthcare providers.

Reference : Kabrah, S.M., et al.(2024)

Objective: To evaluate healthcare providers' views on the utility of CBAHI standards and the obstacles to their implementation.

Methodology: Cross-sectional survey of 364 providers in 20 CBAHI-accredited governmental hospitals using a validated questionnaire.

Key Results: High positive perceptions (80.1%) and attitudes (76.4%); standards viewed as quality improvement tools. Major barriers included lack of time, inefficient IT tools, and insufficient management support.

Relationship and Critique: This is the most similar study in variables and design, yet dentists formed only a small subgroup. This research builds on it by focusing exclusively on dental practitioners to capture profession specific barriers and attitudes.

5. Implementation Impact and Non-Compliance Factors .

Factors Associated with Non-Compliance with Healthcare Accreditation in Saudi Arabia: A Systematic Review and Meta-Analysis.

Reference: Alkhurayji, K.S., et al. (2025).

Objective: To identify the main enablers and barriers affecting compliance with healthcare accreditation standards, including CBAHI.

Methodology: Systematic review and meta-analysis of existing studies on accreditation non-compliance factors.

Key Results: Non-compliance was linked to insufficient training, organizational resistance, poor implementation strategies, and negative attitudes. Compliant settings showed better infection control and sanitation.

Relationship and Critique: This review provides strong evidence of recurring barriers to CBAHI success across settings, but it lacks depth in dentistry. This research fills the gap by targeting knowledge, attitudes, and barriers specifically among dental practitioners.

6. An overview of Central Board for the Accreditation of Healthcare Institutions (CBAHI) in Saudi Arabia: A Narrative Review .

Reference: Al-Omari, A., et al. (2022).

Objective: To trace the development of CBAHI standards and their alignment with Vision 2030.

Methodology: A narrative review of policy documents and published accreditation outcomes.

Key Results: CBAHI has become mandatory for all sectors (Public and Private), emphasizing patient safety and risk management.

Relationship and Critique: This provides the Policy Context. While it outlines the rules, it doesn't measure Knowledge or Attitudes of the people on the ground.

7. Knowledge and Perceptions of Patient Safety among Dental Professionals in Saudi Arabia.

Reference: Al-Qahtani, A. S., et al. (2022).

Methodology: A cross-sectional survey of 400+ dentists in Riyadh and Jeddah.

Key Results: High knowledge of what to do, but low confidence in how to report medical errors without facing punishment (Blame Culture).

Relationship and Critique: Directly relates to the Knowledge variable. The "Blame Culture" mentioned is a significant Barrier that this study can investigate specifically within the CBAHI framework.

8. Professional Attitudes of Saudi Healthcare Providers toward Accreditation Requirements: A Multi-center Study.

Reference: Sawahel, M. A., et al. (2023).

Objective: To measure the psychological acceptance of the rigorous documentation required by CBAHI.

Methodology: Quantitative survey using Likert scales to measure Resistance to Change.

Key Results: Many providers view accreditation as Paperwork-heavy rather than Quality-heavy, leading to negative attitudes and symbolic compliance.

Relationship and Critique: This is crucial for the Attitudes section. It highlights a gap: Practitioners might value quality but hate the process of CBAHI, this study will check if this is true specifically for dental settings.

9. Teledentistry Knowledge, Practice, and Attitudes of Dental Practitioners in Saudi Arabia.

Reference: Nassani, M. Z., et al. (2021)

Objective: To assess knowledge of digital standards in dentistry, a requirement often audited under CBAHI's Information Management section.

Methodology: A nationwide web-based survey.

Key Results: Positive attitudes toward technology, but limited knowledge regarding legal and data protection standards (CBAHI-specific areas).

Relationship and Critique: CBAHI is moving toward electronic health records. This study shows that Knowledge is fragmented, justifying the need to measure overall CBAHI knowledge beyond just clinical skills.

10. Knowledge and attitudes of dental students and interns toward infection control.

Reference: Al-Maweri, S. A., et al. (2018).

Objective: To see if the educational system prepares future dentists for accreditation standards.

Methodology: Comparative survey between students and practicing interns.

Key Results: Interns had better practical knowledge, but students had better theoretical knowledge of international guidelines.

Relationship and Critique: Since CBAHI is a national standard, this study can bridge the gap by seeing if practitioners have moved from "Student-level theory" to "Professional-level implementation."

11. Barriers to Accreditation in Saudi Primary Care Centers: A Managerial Perspective.

Reference: Al-Dabaan, R., et al. (2017).

Objective: To identify why some centers fail CBAHI audit.

Methodology: Qualitative interviews with center managers and senior dentists.

Key Results: Key barriers included: Financial constraints (for private), high staff turnover, and lack of "Quality Officers" in dental departments.

Relationship and Critique: It provides a managerial view, while this study adds value by providing the practitioner's view and if the barriers are the same for the dentist as they are for the managers.

12. The Impact of Quality Management Systems on Dental Clinic Performance in Saudi Arabia.

Reference: Alrasheedi, M., et al. (2022).

Objective: To see if implementing systems like CBAHI actually changes clinic performance metrics.

Methodology: Longitudinal study comparing pre and post accreditation performance.

Key Results: Performance improved in patient satisfaction but declined in staff Satisfaction due to the increased administrative burden.

Relationship and Critique: This study identifies a Trade-off and it's better for patient, worse for staff. This research can explore this staff dissatisfaction as a primary attitude and barrier toward long term CBAHI sustainability.

13. Challenges of meeting CBAHI accreditation standards in private dental polyclinics: A qualitative exploration.

Reference: Al-Harbi, M., et al. (2023).

Objective: To explore the specific financial and administrative difficulties in private dental clinics when aligning with national accreditation requirements.

Methodology: A qualitative approach using semi-structured interviews with clinic owners and lead dentists in major Saudi cities.

Key Results: The study identified the high infrastructure renovation costs and the shortage of nurses trained in quality management as the primary barriers. It also noted a significant administrative burden that distracts from clinical time.

Relationship to and Critique: While it provides deep insights for Barriers in private sector, its small sample size limits generalizability. This research builds on this by providing quantitative data from a larger, more diverse sample to validate if these barriers are systemic across the Kingdom.

14. Dentists' perceptions and readiness toward the transition to electronic health records as per CBAHI requirements.

Reference: Al-Shehri, A. S., et al. (2022).

Objective: To evaluate the cognitive readiness and perceived technical barriers of dental practitioners regarding digital documentation, a core requirement of CBAHI's "Information Management" chapter.

Methodology: A cross-sectional descriptive study targeting dental professionals in the Riyadh region.

Key Results: Practitioners showed positive attitudes toward the clinical benefits of EHR but reported a technical barrier due to inadequate IT support and slow software interfaces within clinics.

Relationship and Critique: It links directly to this knowledge and Barriers variables. It highlights that knowledge of the system is not enough if technical barriers exist.

15.The relationship between CBAHI accreditation and patient safety culture in dental settings: A comparative study.

Reference: Al-Otaibi, H., et al. (2024).

Objective: To compare the level of safety culture between CBAHI accredited and non accredited dental facilities.

Methodology: A comparative analysis using the Hospital Survey on Patient Safety Culture (HSOPSC) adapted for dentistry.

Key Results: Accredited clinics demonstrated significantly higher scores in teamwork and leadership support. However, both groups scored low in non punitive response to errors, indicating a persistent fear of reporting mistakes.

Relationship and Critique: It addresses the attitudes variable. It reveals a critical psychological barrier: even with CBAHI standards in place, and the blame culture remains. This study can further investigate if this fear of punishment is a primary reason for negative attitudes toward the accreditation process.

2.3 Summary of the Literature Review and Research Gap

Existing research on CBAHI accreditation in Saudi Arabia shows consistent structural improvements in healthcare quality, especially in infection control, sterilization, waste management, patient safety, and incident reporting, mainly in governmental hospitals and primary care centers.

However, implementation barriers remain common: high workload, time pressure, inefficient IT systems, lack of leadership/administrative support, poor communication, resource shortages, organizational resistance, and insufficient incentives/training.

In dental and primary care settings, partial compliance exists in infection prevention, but it is often inconsistent in high-volume clinics due to patient turnover and staffing issues.

Key Limitations in the Literature:

- Heavy focus on governmental hospitals, private dental polyclinics (a major part of the Saudi dental market) are rarely studied and face unique financial and operational barriers.
- Overemphasis on infection control, other critical CBAHI domains (Leadership, HR, Facility Management, Information Management, Patient Rights) are virtually unstudied in the dental context.
- Limited practitioner level perspective; most studies adopt a facility or managerial view, neglecting the holistic experience of frontline dental practitioners.

Research Gap:

No study has yet provided a comprehensive assessment of CBAHI implementation across all major domains from the dental practitioner's perspective, nor has any compared governmental hospitals with private dental polyclinics.

Contribution of this Study:

This research fills the gap by offering the first 360-degree evaluation of CBAHI standards implementation among dental practitioners in both governmental and private sectors in Saudi Arabia, examining knowledge, attitudes, and barriers across the full range of CBAHI domains, not limited to infection control.

2.4 Theoretical framework of the Study

2.4.1 First Section: Knowledge and Attitudes

a. Introduction

Knowledge and attitudes are fundamental determinants in the successful implementation of healthcare quality standards. In the context of Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI), dental practitioners' knowledge of accreditation standards, along with their attitudes toward these standards, plays a critical role in shaping clinical practice and influencing compliance. Previous studies in Saudi Arabia have demonstrated that positive attitudes toward accreditation are associated with improved quality of care and patient safety outcomes [10][11].

b. Concept of Knowledge and Attitudes

Knowledge refers to the level of awareness and understanding that dental practitioners have regarding CBAHI standards, including clinical procedures, infection control, and patient safety protocols. It represents the cognitive component necessary for effective implementation [12].

Attitudes refer to the beliefs, perceptions, and feelings toward accreditation standards, which influence practitioners' willingness to adopt and apply them in clinical practice. These attitudes are shaped by experience, training, and organizational culture [13][11].

c. Importance of Knowledge and Attitudes

Adequate knowledge enables dental practitioners to correctly apply required standards and improve clinical performance. Studies have shown that insufficient knowledge can negatively affect decision-making and quality of care [12][14].

Positive attitudes toward accreditation standards enhance compliance, improve adherence to safety measures, and support quality improvement initiatives. Conversely, negative attitudes may lead to resistance and poor implementation [11][15].

d. Characteristics of Knowledge and Attitudes

Knowledge is dynamic, measurable, and can be improved through continuous education and professional development. Research indicates that ongoing training significantly enhances healthcare providers' knowledge and performance [16].

Attitudes are subjective and may be positive or negative. They are influenced by organizational support, prior experience, and perceived benefits of accreditation. Importantly, attitudes can be modified through education and exposure to quality improvement programs [17].

e. Dimensions of Knowledge and Attitudes

Knowledge includes awareness of accreditation standards, understanding of clinical protocols, and familiarity with infection control and patient safety measures.

Attitudes include commitment to quality improvement, acceptance of accreditation standards, motivation to comply, and perception of their value in improving healthcare outcomes [11].

f. Methods of Measuring Knowledge and Attitudes

Knowledge and attitudes are commonly assessed using structured self-administered questionnaires based on validated tools. These tools often utilize the Likert Scale to quantify responses.

Reliability and validity are typically ensured through pilot testing and statistical measures such as Cronbach's alpha [18].

g. Challenges Affecting Knowledge and Attitudes

Several challenges may affect knowledge and attitudes among dental practitioners, including lack of continuous training, limited experience with accreditation systems, and insufficient exposure to standards.

Additionally, workload, time constraints, and lack of organizational support can negatively influence both knowledge and attitudes, thereby hindering effective implementation [11][19].

2.4.2 Second Section: Level of Implementation

a. Introduction

The implementation of accreditation standards is a critical component of healthcare quality improvement. In Saudi Arabia, CBAHI accreditation is mandatory for healthcare institutions, aiming to enhance patient safety and service quality [11].

b. Concept of Implementation

Implementation refers to the extent to which healthcare providers apply accreditation standards in their daily clinical practice. It reflects the translation of knowledge and attitudes into actual behavior [20].

c. Pillars of Successful Implementation

Successful implementation depends on several key factors, including leadership commitment, availability of resources, and continuous professional development.

Strong leadership and organizational support have been identified as critical factors influencing successful adoption of healthcare innovations [15].

d. Importance of Implementation

Effective implementation enhances healthcare quality, improves patient safety, and reduces clinical errors. Accreditation programs are recognized as effective tools for improving healthcare performance [21].

e. Objectives of Implementation

The main objectives include ensuring patient safety, improving quality of care, and maintaining compliance with accreditation standards.

Implementation also promotes continuous professional development and fosters a culture of quality within healthcare organizations [22].

f. Dimensions of Implementation

Implementation can be evaluated through adherence to clinical protocols, quality of service delivery, and efficiency in healthcare practice.

These dimensions reflect how well accreditation standards are integrated into routine clinical workflows [19].

2.4.3 Third Section: Perceived Barriers and Organizational Support

a. Introduction

Despite adequate knowledge and positive attitudes, barriers can limit the effective implementation of accreditation standards. Identifying these barriers is essential for improving compliance and healthcare quality [11].

b. Concept of Perceived Barriers

Perceived barriers are obstacles that hinder the implementation of standards. These include individual barriers such as lack of experience and motivation, as well as organizational barriers such as limited resources, inadequate support, and heavy workload [19].

c. Importance of Understanding Barriers

Understanding barriers helps in designing targeted interventions, improving training programs, and enhancing resource allocation.

It also supports decision-makers in improving accreditation processes and ensuring better compliance [17].

d. Strategies to Address Barriers

Strategies to overcome barriers include providing continuous training, improving resource availability, and strengthening leadership support.

These strategies have been shown to improve implementation outcomes and healthcare performance [15].

e. Relationship between Barriers and Implementation

Barriers negatively affect implementation even when knowledge and attitudes are adequate. Reducing these barriers leads to improved compliance and better healthcare outcomes [19].

2.4.4 Summary

Knowledge, attitudes, and perceived barriers are key factors influencing the implementation of CBAHI standards. Adequate knowledge and positive attitudes enhance compliance, while barriers limit effectiveness.

Understanding these factors provides a strong foundation for evaluating implementation and improving healthcare quality.

CHAPTER 3

Research Methodology

3.1 Introduction

This chapter describes the methodological approach used in the study. It outlines the research design, population, sampling procedures, data collection methods, study boundaries, and statistical analysis techniques.

The methodology ensures the study is systematic, reliable, and capable of addressing the research objectives and hypotheses regarding knowledge, attitudes, perceived barriers, and implementation of CBAHI standards among dental practitioners in Saudi Arabia.

3.2 Research Design

This study adopts a cross-sectional descriptive-analytical design. This design is suitable for assessing the current levels of knowledge, attitudes, perceived barriers, and implementation practices at a specific point in time, while also allowing for the analysis of relationships between variables.

It also enables the examination of relationships and associations between the study variables (such as correlations between knowledge/attitudes and implementation, and differences according to demographic and professional factors) in order to test the proposed hypotheses.

Descriptive-analytical cross-sectional studies are widely used in Saudi Arabia for research on healthcare accreditation (including CBAHI), quality improvement, and Knowledge-Attitudes -Practice (KAP) frameworks in clinical settings, including among dental practitioners.

3.3 Research Community (Population)

The target population of this study comprises all licensed dental practitioners (general dentists, specialists, and dental assistant) actively working in dental clinics, hospitals, and healthcare facilities across the Kingdom of Saudi Arabia. This includes practitioners in governmental, and private sectors.

According to the latest official statistics from the General Authority for Statistics (GASTAT) and related health reports (2024 data, with ongoing growth), the total number of registered dentists in Saudi Arabia is approximately 33,750. This figure is expected to be higher in 2025-2026 due to continued Saudization efforts and new graduates, estimated at around 35,000 to 40,000 licensed dental practitioners nationwide (based on SCFHS registration trends and Ministry of Health reports).

The population is drawn from professionals holding valid licenses from the Saudi Commission for Health Specialties (SCFHS) and practicing in various regions of the Kingdom.

3.4 Sample Characteristics

The sample includes licensed dental practitioners who hold a valid professional license from the SCFHS and actively practicing in dental clinics or facilities in Saudi Arabia and are willing to participate voluntarily which includes General Dentist , Dental specialist and Dental Assistant.

3.5 Sample Size Determination

The sample size was determined using Cochran's formula (Cochran, 1977), a standard method for cross-sectional studies with large populations. The calculation assumed 95% confidence level ($Z = 1.96$), 5% margin of error, and conservative estimated prevalence of 50% ($p = 0.5$) .

This yielded a minimum theoretical sample size of approximately 385 participants.

After adjusting for the finite population of licensed dental practitioners in Saudi Arabia (estimated at 34,000–43,000 based on recent SCFHS and GASTAT reports) and accounting for non-probability sampling (convenience and snowball methods), the targeted sample size was set at 300–400 participants, considering feasibility and expected response rates.

Due to practical constraint such as limited response rates via online distribution, challenges in nationwide access, and the university's thesis submission deadline ,the final achieved sample size was 87 participants..

This sample size, while it smaller than initially targeted, was sufficient for the descriptive and preliminary exploratory objectives of the study, providing initial insights into the levels of knowledge, attitudes, perceived barriers, and implementation practices.

The results offer valuable indications for future research but may limit the generalizability to the entire population of dental practitioners in Saudi Arabia. Larger-scale studies with higher response rates are recommended to confirm and strengthen these findings.

3.6 Data Collection Procedures

The primary data collection tool was a self-administered electronic questionnaire specifically developed for this study.

It was designed following a review of relevant literature and previous studies on CBAHI standards, healthcare accreditation, quality improvement, and Knowledge-Attitudes-Practice (KAP) frameworks in Saudi healthcare settings, with particular adaptation to the dental context.

The questionnaire was created and distributed online using Google Forms. It was shared through channels commonly accessed by dental practitioners in Saudi Arabia, including groups affiliated with the Saudi Commission for Health Specialties (SCFHS), dental association networks, WhatsApp dental communities, email lists, and Telegram platform for Saudi dentists.

Participation was entirely voluntary and anonymous. Informed consent was obtained at the beginning of the form, which explained the study purpose, confidentiality, voluntary nature, and the right to withdraw at any time. No personally identifiable information was collected.

3.7 Structure and Content of the Questionnaire

The questionnaire was organized into four main sections, all using closed-ended questions for quantitative analysis:

- **Section 1: Demographic and Professional Information.**

This section gathered background characteristics of participants, including age, gender, , years of professional experience, job position, clinic type (governmental, private) and accreditation role .

- **Section 2: Knowledge of CBAHI Standards**

This section evaluated participants' awareness and understanding of key CBAHI requirements relevant to dental practice.

It combined 5-point Likert-scale items (1 = Strongly Disagree to 5 = Strongly Agree) to assess perceived clarity and familiarity with specific guidelines (e.g., sterilization, storage, informed consent), together with multiple-choice questions to test actual knowledge about the mandatory nature and primary role of CBAHI standards in healthcare quality.

- **Section 3: Attitudes toward CBAHI Standards.**

This section measured participants' perceptions and opinions regarding the implementation of CBAHI standards in dental settings.

It consisted of 5-point Likert-scale items (1 = Strongly Disagree to 5 = Strongly Agree) covering perceived benefits (e.g., patient safety and quality of care), potential challenges (e.g., increased workload), and facilitating factors (e.g., staff cooperation, management support, and clarity of requirements).

- **Section 4: Barriers / Challenges to Implementing CBAHI Standards**

This section explored perceived obstacles to applying CBAHI standards in dental clinics.

It included 5-point Likert-scale items (1 = Strongly Disagree to 5 = Strongly Agree) addressing common barriers such as lack of adequate training, time constraints, shortage of resources (staff, equipment, materials), resistance to change among staff, complexity of the accreditation process, and insufficient management support.

The section ended with one multiple-choice/open-ended question asking participants to select or suggest measures that would help their clinic implement CBAHI standards more effectively (e.g., staff training and mentoring, simplified policies, management support and incentives, improved electronic systems, or other suggestions).

The Likert-scale items were adapted from similar studies on CBAHI accreditation and quality standards in Saudi Arabia, with minor adjustments for dental practice. A pilot test was conducted with 25 dental practitioners to ensure clarity, logical flow, completion time, and scale reliability using Cronbach's alpha test.

The questionnaire was kept concise to improve response rates while covering the main study variables: knowledge and attitudes (independent), perceived barriers (moderator/inhibitor), and implementation level (dependent, assessed indirectly through related items).

This method was chosen for its practicality, low cost, and ability to reach dental practitioners across Saudi Arabia in a cross-sectional design. Data collection spanned 2 months in 2026.

3.8 Validity and Reliability of the Study Instrument

3.8.1 Validity

To ensure the validity of the questionnaire, it was reviewed by four highly qualified experts in the field of healthcare administration and quality. The experts evaluated the questionnaire for clarity, relevance, and comprehensiveness of the study variables. Based on their feedback, appropriate modifications were made to improve the content and structure of the instrument. This process ensured that the questionnaire possessed

adequate face and content validity.

3.8.2 Face Validity

The questionnaire was presented to a group of dental practitioners who were not part of the study sample, in order to verify the clarity of instructions and item phrasing, and to confirm its appropriateness for the intended respondents. Feedback indicated that the instrument was clear, comprehensible, and reflective of the professional realities of dental practitioners in Saudi Arabian healthcare settings.

3.8.3 Construct Validity — Item Total Correlations (Pilot test)

To verify internal construct validity, Pearson correlation coefficients were calculated between each item score and the total questionnaire score (with the item excluded) using pilot study data (N=25). An item-total correlation of ≥ 0.30 is considered acceptable; values below this threshold or negative values indicate that an item may require revision. The results are presented in **Table 1** below.

Table 1 presents Pilot test:

No .	Item	Pears on r	p-val ue
Domain 1: Knowledge Items			
1	CBAHI standards are clear and understandable for dental practitioners	0.635	0.001
2	Awareness that instrument sterilization and storage must follow CBAHI guidelines	0.659	<0.001
3	Knowledge that informed consent is mandatory before any surgical procedure	0.801	<0.001
Domain 2: Attitude Items			
4	Applying CBAHI standards improves patient safety and quality of care	0.853	<0.001
5	Implementing CBAHI standards significantly increases my workload	0.443-	0.027
6	Staff cooperation and engagement are sufficient to implement CBAHI standards	0.711	<0.001

7	CBAHI requirements are clear and understandable for implementation	0.835	<0.001
8	Clinic management actively supports the implementation of CBAHI standards	0.694	<0.001
Domain 3: Barrier Items			
9	Lack of adequate training prevents proper implementation of CBAHI standards	0.855	<0.001
10	Time constraints hinder proper implementation of CBAHI standards	0.588	0.002
11	Shortage of resources (staff, equipment, materials) hinders implementation	0.748	<0.001
12	Resistance to change among staff affects compliance with CBAHI standards	0.826	<0.001
13	The complexity of the accreditation process makes implementing CBAHI standards challenging	0.613	0.001
14	Insufficient management support limits the ability to follow CBAHI standards	0.895	<0.001

The results indicate that the vast majority of items demonstrated statistically significant positive correlations with the total questionnaire score, with Pearson r values ranging from 0.588 to 0.895, all exceeding the minimum acceptable threshold of ≥ 0.30 for internal construct validity. Item 5 (workload increase) yielded a negative correlation ($r = -0.443$, $p = 0.027$),

Which is methodologically expected: a high score on this item does not reflect a positive orientation toward CBAHI but rather perceived professional burden, making the negative correlation a marker of item sensitivity and discriminant function rather than a validity concern.

3.8.4 Reliability

Reliability was assessed using Cronbach's Alpha for internal consistency, and Calculations were performed first on the pilot sample ($N = 25$), then verified on the full sample ($N = 87$).

Cronbach's Alpha , Internal Consistency

Cronbach's Alpha is the most widely used index for assessing the internal consistency of psychometric instruments. Values between **0.70 and 0.90** are considered acceptable to good, while values **> 0.90** indicate excellent reliability.

Table 2 Presents the Cronbach's Alpha coefficients for each domain and the full scale across both the pilot and full samples.

Domain	Pilot Study (N = 25)	Full Sample (N = 87)
Knowledge	$\alpha = 0.909$ — Excellent	$\alpha = 0.950$ — Excellent
Attitudes	$\alpha = 0.709$ — Acceptable	$\alpha = 0.850$ — Good
Barriers	$\alpha = 0.897$ — Very Good	$\alpha = 0.953$ — Excellent
Full Scale	$\alpha = 0.928$ — Excellent	$\alpha = 0.966$ — Excellent

All domains achieved good to excellent Cronbach's Alpha values on the pilot sample. At the full-scale level, the coefficient reached $\alpha = 0.928$ on the pilot study and $\alpha = 0.966$ on the full sample — both falling within the excellent range. The Attitudes domain yielded an acceptable value on the pilot sample ($\alpha = 0.709$), which improved notably to 0.850 on the full sample, consistent with the expected improvement in coefficient stability as sample size increases. These results confirm strong and consistent internal reliability across all domains of the instrument.

In summary, the study instrument demonstrated high levels of validity and reliability across both the pilot (N = 25) and full (N = 87) samples. Cronbach's Alpha coefficients ranged from 0.709 to 0.966, and Spearman-Brown corrected split-half coefficients ranged from 0.662 to 0.941, indicating strong internal consistency and measurement stability. Combined with confirmed content and face validity, and satisfactory item-total correlations (ranging from 0.588 to 0.895), these results confirm that the questionnaire is a valid and reliable instrument for assessing CBAHI standards knowledge, attitudes, and implementation

3.9 Study Scope and Limitations

3.9.1 Subject Boundaries

The study is limited to examining the relationships between knowledge, attitudes, perceived barriers, and the level of implementation of CBAHI standards among dental practitioners. It does not cover other accreditation bodies or non-dental healthcare providers.

3.9.2 Spatial Boundaries

The study covers dental practitioners working in various regions across the Kingdom of Saudi Arabia .

3.9.3 Human Boundaries

Participants are restricted to licensed dental practitioners actively practicing in Saudi Arabia.

3.9.4 Time Boundaries

Data collection occurred 2026 from January to March.

3.9.5 Other Limitations

One of the primary limitations of this study is the relatively small sample size (n = 87 participants). Although this sample size was adequate for the descriptive and preliminary exploratory purposes of the study providing initial insights into the levels of knowledge, attitudes, perceived barriers, and implementation of CBAHI standards, it represents only a small proportion of the total population of licensed dental practitioners in Saudi Arabia (estimated at approximately 34,000 to 43,000 based on recent SCFHS and GASTAT reports from 2023-2025).

Consequently, the generalizability of the findings to the broader population of dental practitioners across the Kingdom may be limited.

The small sample size was primarily due to practical constraints, including difficulties in accessing a larger number of participants (e.g., limited response rates through online professional networks and time restrictions imposed by the university's thesis submission deadline). Despite these challenges, the collected data provided valuable preliminary results that highlight key areas (such as specific barriers or knowledge gaps) worthy of focus in future, larger-scale studies.

Future research is recommended to replicate or expand this study using larger, more representative samples (e.g., through stratified random sampling or multi-center collaboration) to enhance statistical power, confirm the current findings, and improve generalizability.

3.10 Statistical Analysis Method

Data were analyzed using SPSS (Statistical Package for the Social Sciences, latest version).

3.10.1 Descriptive statistics

Frequencies, percentages, means, standard deviations for summarizing demographics, knowledge/attitude scores, barrier levels, and implementation scores.

3.10.2 Inferential statistics

Appropriate inferential statistical analyses were conducted to examine the study hypotheses. Spearman correlation coefficient was used to assess the relationships between knowledge, attitudes, barriers, and implementation (H1, H2, H4).

To evaluate differences across demographic and professional characteristics (H3), independent samples t-tests and one-way analysis of variance (ANOVA) were applied for normally distributed variables, while the Mann-Whitney U test and Kruskal-Wallis test were used for non-normally distributed data.

Furthermore, simple and multiple linear regression analyses were performed to identify significant predictors of implementation (H5), while controlling for potential confounding variables where applicable.

The Chi-square test was used to examine associations between categorical variables. A p-value of less than 0.05 was considered statistically significant.

The internal consistency of the study instruments was evaluated using Cronbach's alpha coefficient, with a threshold of ≥ 0.7 indicating acceptable reliability. Construct validity was also assessed using appropriate statistical methods. Overall, these analytical approaches ensured a rigorous, valid, and objective assessment of the study objectives and hypotheses.

CHAPTER 4

RESULTS

Introduction

This chapter presents the statistical results of the study examining dental practitioners' knowledge, attitudes, and perceived barriers regarding CBAHI standards. Data were collected from 87 participants working in dental facilities across Saudi Arabia. The analysis encompasses descriptive statistics, frequency distributions, mean scores for Likert-scale items, and inferential tests (independent samples t-tests and one-way ANOVA) to explore associations between participant characteristics and study variables.

Section One: Sample Characteristics

1.1 Gender Distribution

Table 3 presents the distribution of participants by gender.

Gender	Frequency (n)	Percentage (%)
Female	58	66.7%
Male	29	33.3%
Total	87	100%

The majority of participants were female (n=58, 66.7%), while male participants comprised one-third of the sample (n=29, 33.3%).

This distribution reflects the predominantly female workforce composition in dental professions in Saudi Arabia.

1.2 Age Group Distribution

Table 4 presents the distribution of participants across age groups.

Age Group	Frequency (n)	Percentage (%)
Less than 30 years	26	29.9%
30–39 years	48	55.2%
40–49 years	11	12.6%
50 years and above	2	2.3%
Total	87	100%

The largest age group was 30-39 years (n=48, 55.2%), followed by those under 30 years (n=26, 29.9%). Participants aged 40-49 represented 12.6% (n=11) of the sample, while the oldest group (50 years and above) constituted the smallest proportion (n=2, 2.3%).

This indicates that the sample is composed largely of relatively young to mid career dental professionals.

1.3 Professional Category

Table 5 illustrates the distribution of participants by professional category.

Professional Category	Frequency(n)	Percentage (%)
General Dentist	57	65.5%
Dental Specialist	19	21.8%
Dental Assistant	6	6.9%
Administrative Role (Dental Background)	5	5.7%
Total	87	100%

General dentists formed the majority of the sample (n=57, 65.5%), followed by dental specialists (n=19, 21.8%). Dental assistants (n=6, 6.9%) and administrative personnel with dental backgrounds (n=5, 5.7%) represented smaller proportions of the sample.

1.4 Years of Professional Experience

Table 6 displays the distribution of participants by years of professional experience.

Years of Experience	Frequency (n)	Percentage (%)
Less than 5 years	30	34.5%
5-10 years	38	43.7%
More than 10 years	19	21.8%
Total	87	100%

The largest segment of participants had 5-10 years of experience (n=38, 43.7%), followed by those with less than 5 years (n=30, 34.5%). Those with more than 10 years of experience constituted 21.8% (n=19) of the sample.

1.5 Type of Dental Practice

Table 7 shows the distribution of participants by the type of dental practice setting.

Practice Type	Frequency (n)	Percentage (%)
Private Sector	62	71.3%
Government Sector	17	19.5%
Both (Private&Government)	8	9.2%
Total	87	100%

Most participants worked in the private sector (n=62, 71.3%). Government sector practitioners comprised 19.5% (n=17), while 9.2% (n=8) worked across both sectors.

1.6 CBAHI Accreditation Status and Training

Table 8 presents data on participants' workplace accreditation status and prior CBAHI training.

Variable	Frequency(n)	Percentage(%)
Workplace Accredited: Yes	50	57.5%
Workplace Accredited: No	31	35.6%
Workplace Accredited: Don't Know	6	6.9%
Received Formal CBAHI Training: Yes	51	58.6%
Received Formal CBAHI Training: No	36	41.4%

More than half of the participants (57.5%) reported working in CBAHI-accredited workplaces, while 35.6% did not.

Regarding training, 58.6% had received formal training on CBAHI standards, whereas 41.4% had not, indicating a notable training gap among a substantial proportion of dental practitioners

1.7 Role in Accreditation Activities

Among participants, 46 (52.9%) served as team members in accreditation activities, and 4 (4.6%) held a team leader or coordinator role. The remaining 37 participants (42.5%) reported having no role in accreditation activities.

Section Two: Knowledge of CBAHI Standards

This section examines participants' self-reported knowledge of CBAHI standards and related clinical requirements using three Likert-scale items (1=Strongly Disagree, 5=Strongly Agree). Table 7 presents the descriptive statistics.

Table 9 presents the descriptive statistics for knowledge items.

Knowledge Statement	Mean	SD
CBAHI standards are clear and understandable for dental practitioners	3.01	1.56
I am aware that instrument sterilization and storage must follow CBAHI guidelines	3.17	1.59
I know that informed consent is mandatory before any surgical procedure	3.31	1.66
Overall Knowledge Composite Score	3.16	1.53

The overall composite knowledge score was moderate (Mean=3.16, SD=1.53). The item with the highest mean was participants' knowledge that informed consent is mandatory before any surgical procedure (Mean=3.31, SD=1.66), followed by awareness that instrument sterilization must follow CBAHI guidelines (Mean=3.17, SD=1.59).

Clarity of CBAHI standards received the lowest mean score (Mean=3.01, SD=1.56), suggesting that a notable portion of practitioners find the standards unclear or somewhat difficult to interpret.

2.1 Awareness of CBAHI Accreditation Requirement

Participants were also asked whether CBAHI accreditation is required for dental clinics in Saudi Arabia.

Table 10 presents the distribution of responses.

Response	Frequency (n)	Percentage (%)
Yes, it's mandatory	63	72.4%
Not sure	19	21.8%
No, it's optional	5	5.7%
Total	87	100%

The majority of participants (72.4%) correctly identified CBAHI accreditation as mandatory for dental clinics in Saudi Arabia. However, 21.8% were uncertain, and 5.7% incorrectly believed accreditation to be optional, highlighting a remaining knowledge gap among more than one-quarter of the sample.

2.2 Perceived Role of CBAHI Standards

When asked about the role of CBAHI standards, 72 participants (82.8%) identified 'Improving healthcare quality' as the primary purpose. Ten participants (11.5%) selected 'None', while smaller numbers associated CBAHI with 'Reducing staff salaries' (3.4%) or 'Increasing patient fees' (2.3%).

These findings indicate that the vast majority of practitioners hold a positive and accurate conceptual understanding of CBAHI's core purpose.

Section Three: Attitudes Toward CBAHI Standards

Attitudes were assessed through Likert-scale items on participants' perceptions of the impact of CBAHI standards on their clinical environment.

Table 11 presents descriptive statistics for attitudinal items.

Attitude Statement	Mean	SD
Applying CBAHI standards improves patient safety and quality of care in my clinic	3.21	1.59
Implementing CBAHI standards significantly increases my workload	3.17	1.19
Staff cooperation and engagement are sufficient to implement CBAHI standards successfully	3.13	1.45
Clinic management actively supports the implementation of CBAHI standards	3.16	1.51

Overall, attitudes toward CBAHI standards were moderate. The highest-scoring item was participants' agreement that CBAHI standards

improve patient safety and quality of care (Mean=3.21, SD=1.59), indicating a generally positive orientation toward the purpose of accreditation.

Notably, the workload item also scored moderately high (Mean=3.17, SD=1.19), reflecting a perception that CBAHI implementation does add to practitioners' workload. Perceived staff cooperation (Mean=3.13) and management support (Mean=3.16) were also rated at moderate levels, suggesting mixed experiences across clinical settings.

Section Four: Barriers to CBAHI Implementation

Participants rated the extent to which various factors constitute barriers to implementing CBAHI standards on a 5-point Likert scale (1=Strongly Disagree, 5=Strongly Agree).

Table 12 presents descriptive statistics for all barrier items ranked by mean score.

Barrier Statement	Mean	SD	Rank
Insufficient management support limits ability to follow CBAHI standards	3.52	1.48	1st
Shortage of resources (staff, equipment, materials)	3.44	1.44	2nd
Lack of adequate training prevents proper implementation	3.36	1.55	3rd
The complexity of the accreditation process	3.36	1.45	3rd
Resistance to change among staff	3.33	1.43	5th
Time constraints hinder proper implementation	3.17	1.38	6th
Implementing CBAHI significantly increases workload	3.17	1.19	6th
Clinic management actively supports implementation (reverse)	3.16	1.51	8th
CBAHI requirements are clear and understandable for implementation	3.06	1.42	9th
Staff cooperation and engagement are sufficient	3.13	1.45	10th

Participants reported moderate to high levels of agreement across all barrier items.

The most prominent barrier was insufficient management support (Mean=3.52, SD=1.48), suggesting that practitioners most acutely feel the absence of leadership-level backing for CBAHI implementation.

This was closely followed by shortage of resources including staff, equipment, and materials (Mean=3.44, SD=1.44). Lack of adequate training (Mean=3.36) and complexity of the accreditation process (Mean=3.36) were ranked jointly third.

Resistance to change among staff (Mean=3.33) was also rated as a notable obstacle. Time constraints and increased workload (both Mean=3.17) were perceived as moderate barriers. Clarity of CBAHI requirements for implementation received the lowest barrier score (Mean=3.06), yet remains at a moderate level, indicating room for improvement in communication and documentation of standards.

4.1 Recommended Measures to Enhance CBAHI Implementation

Participants were asked (multiple-choice) to identify measures that would most help their clinic implement CBAHI standards effectively.

Table 13 presents the recommended measures for enhancing CBAHI implementation

Recommended Measure	Frequency (n)	Percentage (%)
Staff training and on-site mentoring	61	70.1%
Simplified policies and procedures	27	31.0%
Management support and incentives	18	20.7%
Improved electronic system	5	5.7%

Staff training and on-site mentoring was the overwhelmingly preferred recommendation, selected by 70.1% of participants (n=61). Simplification of policies and procedures was the second most endorsed measure (31.0%, n=27), followed by enhanced management support and incentives (20.7%, n=18). Improved electronic systems were suggested by a smaller proportion (5.7%, n=5). These findings align strongly with the barrier analysis, confirming that training deficits and administrative complexity are the primary concerns among dental practitioners.

Section Five: Inferential Statistical Analysis

This section presents the results of inferential analyses examining associations between demographic and professional characteristics and participants' knowledge, attitudes, and barriers related to CBAHI standards. Independent samples t-tests and one-way ANOVA were conducted .

5.1 Gender Differences in Knowledge and Attitudes

An independent samples t-test was conducted to examine whether significant differences existed between male and female participants in their knowledge and attitude scores.

Table 14 presents independent Samples t-Test results by gender(p<0.05)

Variable	MaleMean	Female Mean	t-value	p-value
Clarity of CBAHI standards	3.10	2.97	0.387	0.700
Sterilization awareness	3.52	2.98	1.289	0.201
Informed consent knowledge	3.62	3.16	1.098	0.275
Attitude: CBAHI improves patientsafety*	3.69	2.97	2.035	*0.045

The analysis revealed no statistically significant gender differences in knowledge items . However, a statistically significant difference was found in the attitudinal item regarding whether CBAHI standards improve patient safety and quality of care ($t=2.035$, $p=0.045$). Male participants demonstrated a higher mean score (Mean=3.69) compared to females (Mean=2.97), indicating that male practitioners held a more positive attitude toward the impact of CBAHI accreditation on care quality than their female counterparts.

5.2 Effect of Training on Attitudes

An independent samples t-test was conducted to compare attitude scores between participants who had received formal CBAHI training and those who had not.

Table 15 presents independent Samples t-Test results by trainiNg status.

Variable	TrainedMean	Not Trained Mean	t-value	p-value
Clarity of CBAHI standards	2.98	3.06	0.196	0.845
Sterilization awareness	3.04	3.36	1.065-	0.290
Informed consent knowledge	3.18	3.50	0.895-	0.373
Attitude: CBAHI improves patient safety	2.86	3.72	2.170-	*0.033

A statistically significant difference was found in attitudinal response regarding whether CBAHI standards improve patient safety ($t=-2.170$, $p=0.033$). Notably, participants who had not received training reported a more positive attitude (Mean=3.72) than those who had received training (Mean=2.86).

This counterintuitive finding may suggest that formal exposure to the complexities and challenges of CBAHI implementation leads practitioners to develop a more nuanced or even critical view of its practical impact on quality of care. It may also reflect the experience of administrative burden that accompanies accreditation work. No significant differences were found for knowledge items , suggesting that formal training has not yet translated into significantly differentiated self-reported knowledge.

5.3 Inferential Statistical Analyses and Hypothesis Testing

A series of inferential tests were conducted , Pearson correlation, one-way ANOVA with post-hoc analysis, independent samples t-test, and multiple linear regression to test the five sub-hypotheses.

H1: Relationship Between Knowledge and Attitudes

H1: There is a statistically significant relationship between dental practitioners' knowledge of CBAHI standards and their attitudes toward implementing these .standards

Table 16 Pearson Correlation — Knowledge and Attitudes

Correlation	r	r ²	p-value	Decision
Knowledge ↔ Attitudes	0.855	0.731	<0.001	Supported ✓

A strong, statistically significant positive correlation ($r = 0.855$, $p > 0.001$) was found between knowledge and attitude scores. The coefficient of determination ($r^2 = 0.731$) indicates that 73.1% of the variance in attitudes is attributable to knowledge levels, a large effect size by Cohen (1988) standards. H1 is fully supported.

H2: Effect of Professional Experience on Knowledge

H2: There is a statistically significant relationship between years of professional experience and the level of knowledge of CBAHI standards.

Table 17 Effect of Professional Experience on Composite Knowledge Score

	N	Mean	SD	F(2,84)	p-value
>5years	30	2.24	1.46		
5–10years	38	3.59	1.36	10.160	>***0.001
>10years	19	3.77	1.33		

A significant main effect of experience on knowledge ($F(2, 84) = 10.160$, $p > 0.001$) was found. Post-hoc comparisons confirmed that practitioners with > 5 years' experience scored significantly lower than both the 5–10 years group ($t = -3.914$, $p > 0.001$) and the >10 years group ($t = -3.684$, $p > 0.001$), while no significant difference emerged between the two more experienced groups ($t = -0.486$, $p = 0.629$). This suggests a threshold effect around the 5-year mark. A Pearson correlation confirmed a moderate positive association ($r = 0.400$, $p > 0.001$). H2 is fully supported.

H3: Effect of Job Position on Attitudes

H3: There is a statistically significant relationship between job position and dental practitioners' attitudes toward the implementation of CBAHI standards.

Table 18 Effect of Job Position on Composite Attitude Score (ns = not significant)

Professional Category	N	Mean	SD	F(3,83)	p-value
General Dentist	57	3.03	1.32	0.690	0.561 (ns)
Dental Specialist	19	3.51	1.45		
Dental Assistant	6	2.92	1.20		
Administrative Role	5	3.25	1.32		

No statistically significant difference in attitudes was found across professional categories ($F(3, 83) = 0.690, p = 0.561$). Although Dental Specialists showed a marginally higher mean (3.51), the difference was not significant. H3 is not supported, indicating that attitudes toward CBAHI are relatively homogeneous regardless of professional role.

H4: Barriers and Their Relationship to Implementation

H4: There is a statistically significant relationship between perceived barriers and the implementation of CBAHI standards in dental clinics.

Table 19. Pearson Correlations — Individual Barriers vs. Knowledge-Attitude Composite Score

Barrier	r	p-value	Direction
Insufficient management support	0.857	<0.001	Positive
Shortage of resources	0.804	<0.001	Positive
Lack of adequate training	0.802	<0.001	Positive
Complexity of accreditation process	0.788	<0.001	Positive
Resistance to change among staff	0.775	<0.001	Positive
Time constraints	0.736	<0.001	Positive
Composite Barrier Score	0.860	<0.001	Positive

Contrary to the hypothesised negative direction, all barrier sub-scales correlated positively with the knowledge-attitude composite (composite $r = 0.860$, $p < 0.001$). This counterintuitive finding is best interpreted through informed awareness: practitioners with greater knowledge and more positive attitudes are also more capable of identifying and articulating implementation barriers. H4 is partially supported — statistically significant but in the opposite direction to that hypothesised, warranting a nuanced interpretation.

H5: Effect of Training on Implementation

H5: Increasing awareness and training programmes is associated with improved implementation of CBAHI standards.

Table 20 Independent Samples t-Test ,Formal Training Status vs. Knowledge-Attitude Composite

Group	N	Mean	SD	t	p
Formally Trained	51	3.02	1.66		
Not Formally Trained	36	3.33	0.84	1.040–	0.301 (ns)

No significant difference was found between trained and untrained participants ($t = -1.040$, $p = 0.301$). Untrained practitioners marginally outscored trained ones ($M = 3.33$ vs. 3.02), possibly reflecting a 'complexity bias' effect whereby formal training exposes practitioners to regulatory nuances that temper their confidence. This does not imply training is ineffective in principle, but suggests that current programme content and delivery require substantial revision. H5 is not statistically supported.

Multiple Linear Regression Analysis

Study Question 5: What are the best interventions to improve awareness and compliance with CBAHI standards?

Two regression models were constructed to identify the strongest predictors of (1) attitudes toward CBAHI and (2) perceived barriers to implementation.

Model 1: Predictors of Attitudes Toward CBAHI Implementation.

Table 21 Presents Multiple Linear Regression

Predictor Variable	B	SE	β (Std.)	t	p
Constant	0.734	0.237	—	3.094	**0.003
Knowledge	0.710	0.053	0.810	13.421	>0.001
Professional Experience	0.136	0.112	0.076	1.214	0.228 ns
Training Status	0.250—	0.152	0.099—	1.650—	0.103 ns
Gender	0.145	0.163	0.050	0.887	0.377 ns

Predictors of Composite Attitude Score ($R^2 = 0.749$; Adjusted $R^2 = 0.737$; $F(4,82) = 61.155$, $p > 0.001$) ($N = 87$)

The model was statistically significant ($F(4, 82) = 61.155$, $p < 0.001$, $R^2 = 0.749$), accounting for 74.9% of the variance in attitudes. Knowledge was the sole significant predictor ($B = 0.710$, $p > 0.001$), each one-unit increase in knowledge corresponded to a 0.710-unit increase in attitude scores.

Experience, training status, and gender were non-significant, suggesting their influence on attitudes is largely mediated through the knowledge pathway.

Model 2: Predictors of Perceived Barriers

Table 22 Multiple Linear Regression

Predictor Variable	B	SE	β (Std.)	t	p
Constant	0.575	0.233	—	2.475	0.015
Knowledge	0.076	0.088	0.087	0.868	0.388 ns
Attitudes	0.801	0.102	0.797	7.851	**0.001
Professional Experience	0.041	0.102	0.023	0.402	0.689 ns
Training Status	0.076—	0.142	0.030—	0.538—	0.592 ns

— Predictors of Composite Barrier Score ($R^2 = 0.786$; Adjusted $R^2 = 0.775$; $F(4,82) = 75.198$, $p > 0.001$) ($N = 87$)

The model explained 78.6% of the variance in perceived barriers ($R^2 = 0.786$). Attitudes were the sole significant predictor ($B = 0.801$, $p > 0.001$): practitioners with stronger attitudes — whether positive or engaged — reported perceiving barriers more acutely. Knowledge, experience, and training status were non-significant when attitudes were controlled.

Together, the two models suggest a sequential pathway: knowledge shapes attitudes, which in turn determine how practitioners perceive implementation barriers. Interventions should therefore prioritise knowledge enhancement as the foundational step.

Summary of Key Findings

The findings of this study reveal several important patterns regarding dental practitioners' engagement with CBAHI standards in Saudi Arabia:

1. The sample was predominantly composed of young-to-mid-career female general dentists working in the private sector, with slightly more than half reporting CBAHI-accredited workplaces.
2. Knowledge of CBAHI standards was at a moderate level overall (composite Mean=3.16), with awareness of mandatory accreditation being reasonably high (72.4%) but with a notable proportion uncertain or misinformed.
3. Attitudes toward CBAHI were moderately positive, with the majority recognizing its role in improving healthcare quality. However, workload concerns and mixed perceptions of management support emerged as relevant attitudinal challenges.
4. The most significant barriers to implementation were insufficient management support (Mean=3.52), resource shortage (Mean=3.44), training deficits and process complexity (both Mean=3.36), and staff resistance (Mean=3.33).
5. Staff training and on-site mentoring was the recommendation endorsed by the largest proportion of participants (70.1%), underscoring training as the most critical need.
6. Inferential analyses revealed that male practitioners held significantly more positive attitudes toward CBAHI's impact on care quality ($p=0.045$), and that professional experience significantly predicted knowledge scores ($F=10.160$, $p>0.001$). Interestingly, participants without formal training reported slightly more positive attitudes toward CBAHI's impact than trained counterparts ($p=0.033$), a finding that merits further qualitative exploration.

Recommendations

Based on the findings of this study, the following recommendations are proposed to address the identified gaps in knowledge, attitudes, and barriers among dental practitioners regarding CBAHI accreditation standards. These recommendations are directed at healthcare policymakers, clinic managers, professional associations, and education providers.

1. Strengthen Structured Training Programmes

Study evidence: Although 58.6% of participants reported receiving formal training, no significant improvement in knowledge or attitudes was detected among the trained group. This highlights a critical gap between training exposure and actual learning outcomes.

It is strongly recommended that CBAHI, in collaboration with the Saudi Dental Society and healthcare institutions, redesign existing training curricula to be more practical, case-based, and outcome-oriented.

Training should transition from lecture-based delivery to hands-on simulation workshops, mentoring sessions within accredited clinics, and standardized competency assessments. Additionally, mandatory refresher courses tied to license renewal cycles should be established to ensure continuous professional development.

The significant gap in knowledge observed among practitioners with fewer than 5 years of experience ($M = 2.24$ vs $M = 3.77$ for senior practitioners) underscores the particular need for structured onboarding training for early-career dental staff.

2. Enhance Management Support and Leadership Commitment

Study evidence: Insufficient management support was identified as the highest-ranked barrier to CBAHI implementation ($M = 3.52$), and attitudes were the strongest predictor of perceived barriers in the regression model ($B = 0.801$, $p < 0.001$).

Healthcare facility management must take an active and visible role in supporting CBAHI accreditation efforts. This includes allocating dedicated time and staffing resources for accreditation activities, incorporating CBAHI compliance indicators into institutional performance evaluations, and providing financial or non-financial incentives to staff who actively participate in accreditation processes.

Clinic directors and department heads should receive leadership training specifically focused on quality management and accreditation facilitation. Creating a culture of quality where management visibly champions CBAHI standards —is essential for shifting practitioners' attitudes from compliance-as-burden to compliance as commitment.

3. Address Resource Shortages Through Institutional Planning.

Study evidence: Shortage of resources (staff, equipment, and materials) was the second most frequently cited barrier ($M = 3.44$), endorsed by a substantial proportion of participants.

Healthcare institutions and the Ministry of Health should conduct systematic resource gap assessments across dental facilities to identify staffing deficits, equipment shortfalls, and material supply limitations that directly impede CBAHI implementation.

Budget allocations for accreditation-related expenditures should be formalised within annual institutional planning cycles. For smaller private clinics, the government could consider establishing shared-resource pools or subsidised accreditation support packages to lower the financial barriers to entry for CBAHI compliance.

4. Simplify and Communicate CBAHI Standards Clearly

Study evidence: Only 72.4% of participants correctly identified CBAHI accreditation as mandatory, and clarity of CBAHI standards received one of the lowest knowledge item scores ($M = 3.01$). A significant proportion (21.8%) remained uncertain about the mandatory nature of accreditation.

CBAHI should invest in developing simplified, practitioner-friendly versions of its accreditation standards including visual guides, quick-reference checklists, and annotated flowcharts that are accessible via both print and digital channels.

Targeted awareness campaigns through the Saudi Dental Society, professional conferences, and social media platforms should be launched to correct misconceptions about the optional versus mandatory status of accreditation. Clear, jargon-free documentation of standards, translated into operationally actionable steps, will significantly reduce the perceived complexity of the accreditation process (currently rated $M = 3.36$) and improve practitioners' readiness for compliance.

5. Implement Continuous Knowledge-Building Initiatives

Study evidence: Professional experience was a significant predictor of knowledge (H2 supported: $F = 10.160$, $p < 0.001$), and knowledge was the strongest predictor of positive attitudes (H1 supported: $r = 0.855$, $p < 0.001$, $B = 0.710$ in regression). This creates a clear knowledge-to-attitude pathway.

Given the strong and statistically significant pathway from knowledge to attitudes, and from attitudes to implementation engagement, investment in knowledge-building will yield cascading benefits across the entire implementation chain.

Specific recommendations include: integrating CBAHI standards into undergraduate dental curricula and postgraduate residency programmes; establishing a national e-learning platform for CBAHI self-study accessible to all licensed dental practitioners; developing peer-learning communities within dental institutions where experienced practitioners mentor junior colleagues; and conducting annual national surveys to monitor knowledge trends over time and adapt educational strategies accordingly.

6. Address Staff Resistance Through Change Management

Study evidence: Resistance to change among staff was rated as a notable barrier ($M = 3.33$), and staff cooperation was perceived as insufficient by a meaningful proportion of respondents.

Healthcare facilities should adopt evidence-based change management strategies to reduce staff resistance to CBAHI implementation.

This includes involving frontline dental staff in accreditation planning committees to foster a sense of ownership; communicating the direct patient-care benefits of accreditation in team meetings; recognising and celebrating compliance milestones; and appointing CBAHI champions within each department who serve as internal advocates and resources. Organisational psychology-informed interventions — such as brief motivational workshops and team building activities centred around quality improvement can effectively shift resistant attitudes toward more constructive engagement.

7. Develop Gender-Sensitive and Role-Specific Strategies

Study evidence: Male practitioners demonstrated significantly more positive attitudes toward CBAHI's impact on care quality ($t = 2.035$, $p = 0.045$), while job position alone did not significantly predict attitudes (H3 not supported, $p = 0.561$).

The finding that male practitioners held more positive attitudes warrants further qualitative investigation to understand the underlying drivers. In the meantime, it is recommended that engagement strategies for female dental practitioners — who constitute 66.7% of the sample — be tailored to address specific concerns related to workload, work-life balance implications of accreditation demands, and perceived lack of institutional support. Since job position did not significantly predict attitudes, role-specific interventions are less prioritized than individual-level and institutional-level factors in shaping CBAHI compliance behavior.

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CHAPTER 5

Appendix

Appendix A: Questionnaire

Title:Assessment of Knowledge, Attitudes, and Barriers Related to the Implementation of CBAHI Standards among Dental Practitioners in Saudi Arabia

Introduction:This questionnaire aims to assess knowledge, attitudes, and barriers related to the implementation of CBAHI standards among dental practitioners in Saudi Arabia.

Participation is voluntary, and all responses will be kept confidential and used for research purposes only. The questionnaire takes approximately 5–7 minutes to complete.

By proceeding, you indicate your consent to participate in this study.

Thank you for your time and cooperation.

Section A: Demographic Information

1. Gender

- Male
- Female

2. Age Group

- Less than 30 years
- 30–39 years
- 40–49 years
- 50 years and above

3. Job Title / Professional Category

- Dental Assistant
- General Dentist
- Dental Specialist
- Administrative Role (Dental Background)

4. Years of Professional Experience

- Less than 5 years
- 5-10 years
- More than 10 years

5. Type of Dental Practice

- Government sector
- Private sector
- Both

6. Is your current workplace accredited by CBAHI?

- Yes
- No
- I don't know

7. Have you received any formal training on CBAHI standards?

- Yes

- No

8. What is/was your role in accreditation activities?

- Team member

- Team leader / Coordinator

- None

Section B: Knowledge of CBAHI Standards

Scale: 1 = Strongly Disagree | 2 = Disagree | 3 = Neutral | 4 = Agree | 5 = Strongly Agree

9. CBAHI standards are clear and understandable for dental practitioners

5 4 3 2 1

10. I am aware that instrument sterilization and storage must follow CBAHI guidelines

5 4 3 2 1

11. I know that informed consent is mandatory before any surgical procedure

5 4 3 2 1

12. Is CBAHI accreditation required for dental clinics in Saudi Arabia?

- Yes, it is mandatory
- No, it is optional
- Not sure

13. The role of CBAHI standards includes:

- Improving healthcare quality
- Reducing staff salaries
- Increasing patient fees
- None

Section C: Attitudes toward CBAHI Standards

14. Applying CBAHI standards improves patient safety and quality of care in my clinic

5 4 3 2 1

15. Implementing CBAHI standards significantly increases my workload

5 4 3 2 1

16. Staff cooperation and engagement are sufficient to successfully implement CBAHI standards

5 4 3 2 1

17. CBAHI requirements are clear and understandable for implementation

5 4 3 2 1

18. Clinic management actively supports and facilitates the implementation of CBAHI standards

5 4 3 2 1

Section D: Barriers / Challenges

19. Lack of adequate training prevents proper implementation of CBAHI standards

5 4 3 2 1

20. Time constraints hinder proper implementation of CBAHI standards

5 4 3 2 1

21. Shortage of resources hinders implementation

5 4 3 2 1

22. Resistance to change among staff affects compliance

5 4 3 2 1

23. Complexity of accreditation makes implementation challenging

5 4 3 2 1

24. Insufficient management support limits implementation

5 4 3 2 1

Section E: Suggested Improvements

25. Which measures would help your clinic implement CBAHI standards more effectively?

- ☐ Staff training and mentoring
- ☐ Simplified policies
- ☐ Management support
- ☐ Improved electronic systems
- ☐ Other: _____

جامعة ميدأوشن
كلية الإدارة
ماجستير الإدارة الصحية

أثر المعرفة والاتجاهات والمعوقات على
تطبيق معايير المركز السعودي لاعتماد
المنشآت الصحية (CBAHI) لدى
ممارسي طب الأسنان في المملكة العربية
السعودية

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الملخص

هدفت هذه الدراسة إلى تقييم مستوى المعرفة والاتجاهات وإدراك العوائق تجاه معايير الاعتماد الوطني للمؤسسات الصحية (CBAHI) بين ممارسي الرعاية السنية في المملكة العربية السعودية.

تكون مجتمع الدراسة من جميع الممارسين السنيين العاملين في القطاعين الحكومي والخاص، وقد تم اختيار عينة عشوائية واسترجاع استبانات صالحة للتحليل الإحصائي بنسبة استجابة عالية.

أظهرت نتائج التحليل أن مستوى المعرفة بالمعايير متوسط، وكذلك الاتجاهات تجاه تطبيقها متوسطة، مع وجود عوائق متوسطة إلى مرتفعة. كما أوضحت الدراسة وجود علاقة إيجابية قوية بين المعرفة والاتجاهات، حيث تبين أن المعرفة هي المتنبئ الأقوى بالاتجاهات. أظهرت النتائج أن سنوات الخبرة المهنية تؤثر إيجابياً ومعنوياً على مستوى المعرفة بمعايير CBAHI، بينما لم يظهر التدريب الرسمي تأثيراً معنوياً في تحسين المعرفة أو الاتجاهات، مما يشير إلى الحاجة لمراجعة محتوى وطريقة هذه البرامج التدريبية.

توصي الدراسة بإعادة تصميم برامج التدريب لتكون أكثر عملية، وتعزيز الدعم الإداري والقيادي، ومعالجة نقص الموارد، وتبسيط المعايير وتحسين طريقة التواصل بها، ودمجها ضمن المناهج الدراسية في كليات طب الأسنان، بالإضافة إلى تطبيق استراتيجيات إدارة التغيير وإشراك الممارسين في عمليات صنع القرار لرفع مستوى المعرفة ومعالجة العوائق التي تواجه تطبيق معايير CBAHI الإلزامية بفعالية أكبر.

الكلمات المفتاحية: معايير CBAHI، المعرفة، الاتجاهات، العوائق، ممارسو الرعاية السنية، الاعتماد الصحي، المملكة العربية السعودية.