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Knowledge, Attitudes, and Barriers Toward Implementing CBAHI Standards Among Dental Practitioners in Saudi Arabia

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Abstract

Background: Healthcare accreditation plays a central role in ensuring service quality and patient safety. The Central Board for Accreditation of Healthcare Institutions (CBAHI) sets mandatory national standards for all healthcare facilities in Saudi Arabia, including dental clinics. Despite this, limited evidence exists on how dental practitioners perceive these standards, understand them, or navigate the practical barriers to their implementation. Objectives: This study aimed to assess the level of knowledge, attitudes, and perceived barriers toward CBAHI standards among dental practitioners in Saudi Arabia, and to examine the relationships between these variables and relevant demographic and professional factors. Methods: A cross-sectional descriptive-analytical design was employed. Data were collected from 87 licensed dental practitioners across Saudi Arabia using a validated self-administered electronic questionnaire. Descriptive statistics, independent samples t-tests, one-way ANOVA, Pearson correlation, and multiple linear regression were conducted using SPSS. Results: Knowledge and attitudes toward CBAHI standards were at a moderate level (composite means: 3.16 and 3.17, respectively). Barriers were rated moderate to high, with insufficient management support as the most prominent (mean = 3.52). A strong positive correlation was found between knowledge and attitudes ($r = 0.855$, $p < 0.001$). Knowledge emerged as the sole significant predictor of attitudes ($B = 0.710$, $p < 0.001$), while attitudes were the strongest predictor of perceived barriers ($B = 0.801$, $p < 0.001$). Professional experience significantly predicted knowledge scores ($F = 10.160$, $p < 0.001$), whereas formal training did not produce significant improvements. Conclusions: Dental practitioners in Saudi Arabia demonstrate moderate knowledge and attitudes toward CBAHI standards, with significant implementation barriers. Knowledge is the key driver of positive attitudes and indirectly influences barrier perception. Redesigning training programmes, strengthening management support, and integrating CBAHI content into dental curricula are recommended to enhance compliance.

Keywords: CBAHI standards; healthcare accreditation; dental practitioners; knowledge; attitudes; implementation barriers; Saudi Arabia

1. Introduction

Healthcare quality and patient safety are fundamental pillars of modern health systems worldwide. Accreditation programmes provide a structured framework for assessing whether healthcare institutions meet established standards, thereby ensuring safe, effective, and patient-centred care. In the Kingdom of Saudi Arabia (KSA), the healthcare sector has undergone significant transformation under Vision 2030, with accreditation becoming a primary mechanism for quality assurance.

The Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI) is the national governmental body responsible for developing unified standards, conducting evaluations, and granting accreditation to healthcare facilities. First introduced in 2001 as a regional quality initiative

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in Makkah, CBAHI was officially established in its current form by a Council of Ministers decision in 2013, making accreditation mandatory for all healthcare institutions across the Kingdom.

The dental care sector represents a uniquely high-risk environment within the healthcare system. Dental procedures routinely involve aerosol-generating techniques, sharp instruments, and prolonged close proximity between practitioners and patients, significantly elevating the risk of cross-contamination and healthcare-associated infections. These characteristics make strict adherence to accreditation standards not merely advisable but essential. CBAHI published specific National Standards for Dental Centres in 2022, underscoring the growing recognition of dentistry as a distinct and sensitive sector requiring tailored quality benchmarks.

Despite the documented positive impact of CBAHI accreditation on healthcare quality and patient safety across various settings, a critical knowledge gap exists regarding its specific application within dental practice. Most existing research in this domain has focused on infection control in isolation, with very limited empirical evidence on how dental practitioners—the primary frontline implementers—perceive the full scope of CBAHI standards, understand their requirements, or encounter practical barriers in applying them. This oversight is significant because any divergence between policy and practice in such a high-risk environment may directly compromise patient safety.

The present study therefore aims to provide a comprehensive assessment of knowledge, attitudes, and perceived barriers toward CBAHI standards among dental practitioners in Saudi Arabia, and to examine the relationships between these factors and relevant professional and demographic characteristics. The findings are intended to inform evidence-based recommendations for improving compliance and strengthening the culture of quality in Saudi dental practice.

2. Literature Review

2.1. CBAHI Accreditation: Overview and Impact

CBAHI accreditation has been shown to produce consistent structural improvements in healthcare quality across Saudi Arabia. Studies conducted in governmental hospitals and primary care centres have documented significant gains in infection control, sterilisation practices, waste management, and patient safety reporting following accreditation. Alturbag and Alyahya (2025) provided a narrative overview confirming the breadth of CBAHI's influence, while a systematic review by Alsuhaimi et al. (2025) highlighted its positive impact on institutional performance indicators across multiple regions.

In the dental setting specifically, Alghamdi et al. (2021) evaluated the impact of CBAHI infection control standards in primary care dental clinics in Makkah, finding significant improvements in sterilisation and waste management, though compliance remained inconsistent in high-volume facilities. Bandugh et al. (2021) similarly reported moderate-to-good compliance with infection prevention standards, identifying workload, training variability, and resource shortages as key limiting factors.

2.2. Knowledge and Attitudes toward Accreditation

Knowledge and attitudes are recognised as fundamental determinants of healthcare professionals' compliance with quality standards. Kabrah et al. (2024), in the most directly comparable study to the present research, surveyed 364 providers across 20 CBAHI-accredited governmental hospitals and reported high positive perceptions (80.1%) and attitudes (76.4%) toward CBAHI standards. However, dental practitioners formed only a small subgroup, limiting the applicability of findings to the dental context.

Al-Qahtani et al. (2022) found that while Saudi dentists demonstrated high theoretical knowledge of patient safety practices, they reported low confidence in error reporting due to prevailing blame culture—a finding that may represent a significant barrier to open quality improvement. Sawahel et al. (2023) further documented a tendency among healthcare providers to

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view accreditation primarily as an administrative burden rather than a quality improvement tool, leading to symbolic rather than substantive compliance.

2.3. Barriers to Implementation

Recurring barriers to CBAHI implementation identified across the literature include high workload, time pressure, insufficient training, inadequate management support, resource shortages, complex documentation requirements, and organisational resistance to change. A systematic review and meta-analysis by Alkhurayji et al. (2025) confirmed that non-compliance was consistently linked to these factors across diverse healthcare settings. Al-Harbi et al. (2023) identified high infrastructure costs and shortages of quality management-trained personnel as particularly acute barriers in private dental polyclinics—a sector largely overlooked in prior research.

2.4. Research Gap

Existing literature has disproportionately focused on governmental hospitals and on infection control as an isolated domain, neglecting the broader spectrum of CBAHI standards and the perspective of frontline dental practitioners across both public and private sectors. No published study has yet provided a comprehensive assessment of dental practitioners' knowledge, attitudes, and implementation barriers across all major CBAHI domains. The present study was designed to address this gap by offering the first practitioner-level, multi-sector evaluation of CBAHI standards implementation in Saudi dentistry.

3. Methods

3.1. Study Design

This study employed a cross-sectional descriptive-analytical design, appropriate for assessing current levels of knowledge, attitudes, and perceived barriers at a single point in time while enabling analysis of inter-variable relationships. This design is widely used in KAP (Knowledge–Attitudes–Practice) research within Saudi healthcare accreditation studies.

3.2. Study Population and Sampling

The target population comprised all licensed dental practitioners—including general dentists, dental specialists, and dental assistants—actively practising in governmental and private dental facilities across Saudi Arabia. Based on data from the General Authority for Statistics (GASTAT) and the Saudi Commission for Health Specialties (SCFHS), the total population was estimated at approximately 34,000–43,000 registered dental practitioners.

A convenience and snowball sampling approach was adopted. The minimum theoretical sample size, calculated using Cochran's formula (1977) at a 95% confidence level, 5% margin of error, and conservative prevalence estimate of 50%, was 385 participants. Due to practical constraints including limited online response rates and institutional submission deadlines, the achieved sample was 87 participants. While smaller than the target, this sample was sufficient for the descriptive and preliminary exploratory purposes of the study.

3.3. Data Collection Instrument

Data were collected via a self-administered electronic questionnaire distributed through Google Forms. The questionnaire was disseminated through SCFHS-affiliated networks, dental association channels, WhatsApp communities, and Telegram platforms for Saudi dental practitioners. Participation was voluntary and fully anonymous; informed consent was obtained at the outset.

The questionnaire comprised four sections: (1) demographic and professional information; (2) knowledge of CBAHI standards (3 Likert-scale items and 2 multiple-choice items); (3) attitudes toward CBAHI standards (5 Likert-scale items); and (4) perceived barriers to implementation (6

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Likert-scale items and 1 multiple-choice item). All Likert items used a five-point scale (1 = Strongly Disagree to 5 = Strongly Agree).

3.4. Validity and Reliability

Content validity was established through review by four experts in healthcare administration and quality management, who evaluated the instrument for clarity, relevance, and comprehensiveness. Face validity was confirmed through feedback from a non-study group of dental practitioners. Construct validity was assessed using item-total Pearson correlation coefficients in a pilot study (N = 25); all items exceeded the acceptable threshold of $r \geq 0.30$, with values ranging from 0.588 to 0.895.

Internal consistency was evaluated using Cronbach's alpha. Full-scale alpha was 0.966 (excellent). Domain-level alphas were: Knowledge $\alpha = 0.950$, Attitudes $\alpha = 0.850$, and Barriers $\alpha = 0.953$—all indicating good to excellent reliability.

3.5. Statistical Analysis

Data were analysed using SPSS (latest version). Descriptive statistics (frequencies, percentages, means, standard deviations) summarised demographic characteristics and scale scores. Inferential analyses included independent samples t-tests and one-way ANOVA to examine group differences; Pearson correlation to assess bivariate relationships; and multiple linear regression to identify significant predictors of attitudes and perceived barriers. Statistical significance was set at $p < 0.05$.

4. Results

4.1. Sample Characteristics

A total of 87 dental practitioners participated. The majority were female (66.7%), aged 30–39 years (55.2%), and worked as general dentists (65.5%). Most were employed in the private sector (71.3%), with 5–10 years of professional experience (43.7%). More than half (57.5%) reported working in CBAHI-accredited workplaces, and 58.6% had received formal CBAHI training. Regarding accreditation roles, 52.9% served as team members and 42.5% had no accreditation role.

Table 1. Demographic and professional characteristics of study participants (N = 87).

Characteristic	Category	n	%
Gender	Female	58	66.7%
	Male	29	33.3%
Age Group	< 30 years	26	29.9%
	30–39 years	48	55.2%
	40–49 years	11	12.6%
	≥ 50 years	2	2.3%
Professional Category	General Dentist	57	65.5%
	Dental Specialist	19	21.8%
	Dental Assistant	6	6.9%
	Administrative (Dental)	5	5.7%
Practice Type	Private	62	71.3%
	Government	17	19.5%

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Characteristic	Category	n	%
	Both	8	9.2%
Experience	< 5 years	30	34.5%
	5–10 years	38	43.7%
	> 10 years	19	21.8%

4.2. Knowledge of CBAHI Standards

Overall knowledge was at a moderate level (composite mean = 3.16, SD = 1.53). The highest-scoring item was awareness of mandatory informed consent before surgical procedures (mean = 3.31, SD = 1.66), followed by awareness of sterilisation guidelines (mean = 3.17, SD = 1.59). Clarity of CBAHI standards received the lowest mean (3.01, SD = 1.56). The majority of participants (72.4%) correctly identified CBAHI accreditation as mandatory for dental clinics; however, 21.8% were uncertain and 5.7% incorrectly considered it optional. A large majority (82.8%) accurately identified improving healthcare quality as the primary purpose of CBAHI.

Table 2. Descriptive statistics for knowledge items.

Knowledge Item	Mean	SD
CBAHI standards are clear and understandable	3.01	1.56
Sterilisation and storage must follow CBAHI guidelines	3.17	1.59
Informed consent is mandatory before surgical procedures	3.31	1.66
Composite Knowledge Score	3.16	1.53

4.3. Attitudes toward CBAHI Standards

Attitudes were also at a moderate level. The highest-rated item was 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. Moderate scores were also observed for perceived management support (mean = 3.16) and staff cooperation (mean = 3.13). Notably, the workload item scored moderately high (mean = 3.17), reflecting a perception that CBAHI implementation adds to practitioners' workload.

4.4. Perceived Barriers

Barriers were rated moderate to high across all items. The most prominent barrier was insufficient management support (mean = 3.52, SD = 1.48), followed by resource shortages—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 jointly ranked third. Resistance to change among staff (mean = 3.33) and time constraints (mean = 3.17) were also notable barriers.

Table 3. Descriptive statistics for barrier items ranked by mean score.

Barrier	Mean	SD	Rank
Insufficient management support	3.52	1.48	1st
Shortage of resources (staff, equipment, materials)	3.44	1.44	2nd
Lack of adequate training	3.36	1.55	3rd
Complexity of accreditation process	3.36	1.45	3rd

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Barrier	Mean	SD	Rank
Resistance to change among staff	3.33	1.43	5th
Time constraints	3.17	1.38	6th

Staff training and on-site mentoring was the most endorsed recommendation for improving implementation, selected by 70.1% of participants, followed by simplification of policies and procedures (31.0%) and enhanced management support and incentives (20.7%).

4.5. Inferential Analyses and Hypothesis Testing

4.5.1. Knowledge–Attitude Relationship (H1)

A strong, statistically significant positive correlation was found between knowledge and attitude composite scores ($r = 0.855$, $p < 0.001$). The coefficient of determination ($r^2 = 0.731$) indicated that 73.1% of the variance in attitudes was explained by knowledge—a large effect size by Cohen's (1988) standards. H1 was fully supported.

4.5.2. Professional Experience and Knowledge (H2)

One-way ANOVA revealed a significant main effect of professional experience on knowledge scores ($F(2, 84) = 10.160$, $p < 0.001$). Post-hoc comparisons confirmed that practitioners with fewer than 5 years of experience ($M = 2.24$) scored significantly lower than those with 5–10 years ($M = 3.59$) and more than 10 years of experience ($M = 3.77$), while no significant difference was found between the two more experienced groups. A Pearson correlation confirmed a moderate positive association ($r = 0.400$, $p < 0.001$). H2 was fully supported.

4.5.3. Job Position and Attitudes (H3)

No statistically significant difference in attitudes was found across professional categories ($F(3, 83) = 0.690$, $p = 0.561$), indicating that attitudes toward CBAHI are relatively homogeneous regardless of professional role. H3 was not supported.

4.5.4. Barriers and Implementation (H4)

Contrary to the hypothesised negative relationship, all barrier sub-scales correlated positively with the knowledge–attitude composite (composite $r = 0.860$, $p < 0.001$). This finding is interpreted as reflecting informed awareness: practitioners with greater knowledge and more positive attitudes demonstrate a heightened capacity to identify and articulate implementation barriers. H4 was partially supported, statistically significant but in the opposite direction to that hypothesised.

4.5.5. Effect of Training on Attitudes (H5)

No statistically significant difference was found between trained and untrained participants on the knowledge–attitude composite ($t = -1.040$, $p = 0.301$). Notably, participants who had not received formal CBAHI training reported marginally more positive attitudes toward accreditation's impact on care quality ($M = 3.72$) than trained counterparts ($M = 2.86$; $t = -2.170$, $p = 0.033$). This counterintuitive finding may reflect a 'complexity bias' effect, where exposure to the regulatory and administrative demands of accreditation tempers practitioners' enthusiasm. H5 was not statistically supported.

4.5.6. Regression Analyses

Multiple linear regression identified knowledge as the sole significant predictor of attitudes ($B = 0.710$, $\beta = 0.810$, $p < 0.001$; $R^2 = 0.749$), with professional experience, training status, and gender being non-significant when knowledge was controlled. Attitudes were in turn the sole significant predictor of perceived barriers ($B = 0.801$, $\beta = 0.797$, $p < 0.001$; $R^2 = 0.786$). Together, these models describe a

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sequential pathway: knowledge shapes attitudes, which in turn determine how practitioners perceive implementation barriers.

Table 4. Multiple linear regression models predicting attitudes and perceived barriers.

Predictor	B	β	t	p
Model 1: Outcome = Attitudes (R^2 = 0.749)				
Constant	0.734	—	3.094	0.003
Knowledge	0.710	0.810	13.421	< 0.001
Professional Experience	0.136	0.076	1.214	0.228 (ns)
Training Status	−0.250	−0.099	−1.650	0.103 (ns)
Gender	0.145	0.050	0.887	0.377 (ns)
Model 2: Outcome = Barriers (R^2 = 0.786)				
Constant	0.575	—	2.475	0.015
Attitudes	0.801	0.797	7.851	< 0.001
Knowledge	0.076	0.087	0.868	0.388 (ns)
Professional Experience	0.041	0.023	0.402	0.689 (ns)
Training Status	−0.076	−0.030	−0.538	0.592 (ns)

5. Discussion

This study provides the first comprehensive practitioner-level assessment of CBAHI standards knowledge, attitudes, and perceived barriers in Saudi Arabian dental practice, drawing on a cross-sectional sample of 87 dental practitioners across governmental and private sectors.

5.1. Knowledge and Attitudes

The moderate levels of knowledge and attitudes observed are broadly consistent with findings from comparable studies in Saudi healthcare settings. Kabrah et al. (2024) reported higher positive perceptions among general healthcare providers, though their sample was drawn exclusively from accredited governmental hospitals and may not reflect the full practitioner landscape. The relatively lower knowledge scores in the present study may reflect the predominantly private-sector composition of the sample (71.3%), as private facilities are less consistently exposed to structured accreditation preparation activities.

The finding that 27.5% of participants were uncertain or misinformed about the mandatory status of CBAHI accreditation is a cause for concern, particularly given that accreditation has been legally mandated since 2013. This knowledge deficit aligns with Al-Qahtani et al.'s (2022) observation of fragmented standards awareness among Saudi dentists and underscores the need for targeted awareness campaigns.

5.2. Professional Experience as a Predictor of Knowledge

The significant positive association between professional experience and knowledge (H2 supported; $F = 10.160$, $p < 0.001$) is consistent with the broader literature on experiential learning in healthcare. The identification of a threshold effect at approximately 5 years of experience is a novel and practically important finding, suggesting that the early career period represents a critical window for targeted knowledge-building interventions. The non-significant difference between the

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5–10 year and more than 10-year experience groups indicates that knowledge acquisition may plateau after mid-career, highlighting the importance of continuous professional development.

5.3. The Training Paradox

The counterintuitive finding that formally trained practitioners reported lower attitudes toward CBAHI's impact on care quality ($p = 0.033$), and that training status did not significantly predict composite knowledge or attitudes in the regression model, represents one of the most important and practically significant results of this study. This may reflect a 'complexity bias' or 'disillusionment effect' documented in accreditation research, whereby exposure to the administrative burden and regulatory complexity of CBAHI attenuates practitioners' initial enthusiasm. Sawahel et al. (2023) similarly found that many Saudi healthcare providers viewed accreditation as paperwork-heavy rather than quality-heavy. These findings collectively suggest that current training programme content and delivery methods require substantial review and redesign.

5.4. Barriers to Implementation

The dominance of management-related and resource-related barriers—insufficient management support (mean = 3.52), resource shortages (mean = 3.44)—aligns with the systematic evidence reviewed by Alkhurayji et al. (2025) and with the qualitative findings of Al-Harbi et al. (2023) in private dental polyclinics. The positive correlation between barrier perception and the knowledge–attitude composite ($r = 0.860$) reflects a phenomenon of informed awareness: practitioners with deeper engagement with CBAHI standards are better equipped to recognise and articulate the gaps in their implementation environment. This should be interpreted not as evidence that knowledge worsens barriers, but as confirmation that measurement instruments are capturing genuine implementation challenges among the most knowledgeable respondents.

5.5. Limitations

Several limitations should be acknowledged. The relatively small sample size ($n = 87$), achieved through convenience and snowball sampling, limits the generalisability of findings to the full population of Saudi dental practitioners. Self-report measures are subject to social desirability bias. The cross-sectional design precludes causal inference. Finally, implementation was assessed indirectly through proxy items rather than direct behavioural observation. Future research should employ larger stratified samples, multi-centre designs, and mixed-methods approaches incorporating direct observation of clinical practice.

6. Conclusions

This study demonstrates that dental practitioners in Saudi Arabia hold moderate levels of knowledge and positive attitudes toward CBAHI accreditation standards, with knowledge functioning as the primary driver of attitudes and, through attitudes, of barrier perception. The evidence suggests a sequential implementation pathway—knowledge → attitudes → barriers—which has clear implications for intervention design. Formal training in its current form has not produced the expected improvements in knowledge or attitudes, signalling an urgent need for curriculum redesign toward practical, case-based, and competency-assessed delivery. The persistent barriers of insufficient management support and resource shortages require systemic responses at the institutional and policy levels. Integration of CBAHI content into undergraduate dental curricula and structured mentoring programmes for early-career practitioners are additionally recommended to address knowledge deficits among junior staff. Future large-scale, multi-centre studies are warranted to confirm and extend these preliminary findings.

7. Recommendations

Based on the study findings, the following evidence-based recommendations are proposed:

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1. Redesign Training Programmes: Transition from lecture-based to hands-on, simulation-based, and mentoring-oriented delivery. Establish mandatory refresher courses linked to SCFHS licence renewal cycles. Prioritise early-career practitioners who demonstrated the greatest knowledge deficit.

2. Strengthen Management Support: Incorporate CBAHI compliance into institutional key performance indicators. Provide leadership training in quality management for clinic directors and department heads. Establish visible management championship of accreditation at the facility level.

3. Address Resource Gaps: Conduct systematic resource gap assessments across dental facilities. Formalise accreditation-related budget allocations. Develop subsidised support packages for smaller private clinics.

4. Improve Communication of Standards: Develop practitioner-friendly visual guides, quick-reference checklists, and annotated flowcharts for CBAHI requirements. Launch targeted awareness campaigns through the Saudi Dental Society and professional social media platforms.

5. Integrate Standards into Dental Education: Embed CBAHI standards content into undergraduate curricula and postgraduate residency programmes. Establish a national e-learning platform for self-directed CBAHI study.

6. Implement Change Management Strategies: Involve frontline dental staff in accreditation planning committees. Introduce CBAHI Champions within departments. Employ evidence-based organisational change interventions to reduce staff resistance.

Institutional Review Board Statement: The study was reviewed and approved by the Midocean University Research Ethics Committee (MU-REC) during its full board meeting held on December 24, 2025 (Approval No. Hu-2026-19; valid from December 01, 2025, to December 01, 2027). All procedures were conducted in accordance with the Declaration of Helsinki (2013) and ICH-GCP guidelines. Informed consent was obtained from all participants prior to data collection.

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