



THE CLASH OF AUTHORITY IN DENTAL EDUCATION: A QUALITATIVE STUDY ON HOW PESHAWAR'S DENTAL RESIDENTS BALANCE AI RECOMMENDATIONS WITH CONSULTANT EXPERTISE

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Abstract

Background: Artificial Intelligence (AI) is increasingly integrated into health professions education, particularly within workplace-based clinical training environments. While AI-supported tools promote evidence-informed decision-making, they may also challenge traditional supervisory authority. These tensions represent important but underexplored educational challenges in postgraduate dental training.

Objective: To explore how dental residents in Peshawar experience and manage conflicts between AI-generated clinical recommendations and consultant expertise, and how these encounters influence learning, professional identity formation, and the hidden curriculum.

Methods: A qualitative phenomenological study was conducted between January and June 2024. Fourteen senior dental residents were recruited using purposive maximum variation sampling from public and private dental institutions. Semi-structured interviews focused on critical learning incidents involving authority conflict. Data were analyzed using thematic analysis.

Results: Four major themes emerged: (1) clinical dissonance as a learning tension, (2) hierarchy, assessment, and silence in workplace-based learning, (3) institutional culture shaping epistemic authority, and (4) professional identity formation between obedience and evidence. Residents described emotional discomfort, fear of evaluation, and gradual shaping of professional identity through implicit institutional norms.

Conclusion: Conflicts between algorithmic recommendations and consultant authority are educational phenomena with significant implications for health professions education. Addressing epistemic authority, psychological safety, and algorithmic humility is essential for preparing reflective, evidence-informed clinicians.

Keywords: Health Professions Education; Medical Education; Artificial Intelligence; Hidden Curriculum; Professional Identity Formation; Workplace-Based Learning

Introduction

Clinical education in the health professions primarily takes place within workplace-based learning environments. These settings are inherently hierarchical, where supervisors simultaneously act as teachers, role models, and assessors. Such structures influence not only skill development but also learners' attitudes toward authority and their professional identity formation.

In postgraduate dental education, similar to medical residency training, consultant expertise has traditionally served as the dominant epistemic authority. Clinical knowledge is often transmitted through experience-based guidance and apprenticeship-style learning. However, the increasing incorporation of Artificial Intelligence (AI) into clinical practice has introduced a competing source of authority. AI-supported systems now provide recommendations related to material selection, CAD/CAM workflows, and diagnostic planning, often grounded in large datasets and standardized algorithms.^{1,3}

From a medical education perspective, disagreements between AI-generated recommendations and consultant instructions are not merely technical issues. They represent **educationally significant moments** in which learners must navigate evidence, hierarchy, assessment pressure, and professional behavior. These moments operate largely within the **hidden curriculum**, shaping what residents learn about obedience, voice, and legitimacy of knowledge.^{4,5}

Despite rapid technological adoption, limited research has explored how postgraduate trainees experience these authority conflicts within real clinical learning environments, particularly in low- and middle-income contexts. This study addresses this gap by examining dental residents' lived experiences in Peshawar through a health professions education lens.

Methods

Study Design

A qualitative phenomenological approach was adopted to explore residents' lived experiences of authority conflict within workplace-based clinical education. This design is appropriate for understanding meaning-making, emotional responses, and professional identity formation in health professions education.

Study Setting

The study was conducted in postgraduate dental training programs in Peshawar, Pakistan, including:

- **Public sector:** Khyber College of Dentistry (KCD)
- **Private sector:** Sardar Begum Dental College (SBDC), Peshawar Dental College (PDC), and Rehman College of Dentistry (RCD)

Sampling Strategy and Participants

Purposive sampling with **maximum variation** was used to capture diverse educational experiences. Variation was sought across:

- Public and private institutions
- Gender
- Postgraduate training year (PGY-3 to PGY-5)
- Degree of exposure to AI-assisted clinical tools

Fourteen senior dental residents participated. Sample size was guided by **data saturation**, achieved when no new themes or meanings emerged, consistent with phenomenological research standards.

Data Collection

Data collection was carried out between January 2024 and June 2024, with all study activities completed prior to July 2024. One-on-one semi-structured interviews lasting 40–60 minutes were conducted. Participants were asked to describe critical learning incidents in which AI-generated clinical recommendations conflicted with consultant instructions.

All interviews were audio-recorded with informed consent and transcribed verbatim.

Data Analysis

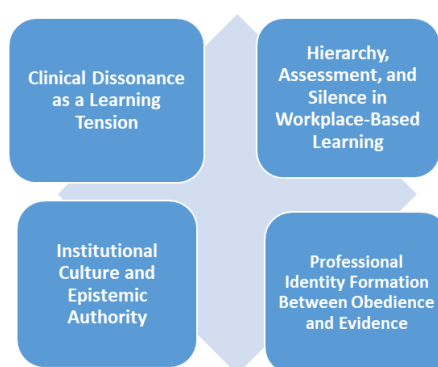
Thematic analysis was conducted through Brauns and Clarks six iterative stages of familiarization, open coding, theme development, and refinement. Coding was done manually and then Nvivo version 14 was used for organization of codes. An audit trail was maintained to enhance credibility. Analysis focused on educational meanings rather than frequency of responses.

Ethical Considerations

Ethical approval was obtained from relevant institutional review boards prior to data collection. Written informed consent was obtained from all participants. Confidentiality and anonymity were strictly maintained.

Results

Four major themes emerged from the analysis, supported by subthemes, initial codes, and illustrative quotations.



Participant Characteristics

Table 1. Demographic and Institutional Details of Participants (n = 14)

<i>Participant ID</i>	<i>Gender</i>	<i>PG Year</i>	<i>Specialty</i>	<i>Institution</i>
<i>MP1</i>	Male	PGY-3	Operative Dentistry	KCD
<i>FP2</i>	Female	PGY-4	Prosthodontics	KCD
<i>MP3</i>	Male	PGY-5	Operative Dentistry	KCD
<i>FP4</i>	Female	PGY-3	Prosthodontics	SBDC
<i>MP5</i>	Male	PGY-4	Operative Dentistry	SBDC
<i>FP6</i>	Female	PGY-5	Prosthodontics	SBDC
<i>MP7</i>	Male	PGY-3	Operative Dentistry	PDC
<i>FP8</i>	Female	PGY-4	Prosthodontics	PDC

MP9	Male	PGY-5	Operative Dentistry	PDC
FP10	Female	PGY-3	Prosthodontics	RCD
MP11	Male	PGY-4	Operative Dentistry	RCD
FP12	Female	PGY-5	Prosthodontics	RCD
MP13	Male	PGY-4	Prosthodontics	RCD
FP14	Female	PGY-3	Operative Dentistry	PDC

Themes and Subthemes :

Theme 1: Clinical Dissonance as a Learning Tension

Residents experienced internal conflict when AI-based recommendations contradicted consultant instructions. These moments disrupted learning and created uncertainty about what constituted “correct” knowledge.

Residents described these encounters as emotionally charged and educationally unresolved, often proceeding with consultant instructions despite believing AI guidance was more evidence-based.

Theme 2: Hierarchy, Assessment, and Silence in Workplace-Based Learning

Residents linked silence to hierarchical structures and fear of assessment consequences. Because consultants also functioned as evaluators, residents avoided questioning decisions to protect their academic standing.

This theme reflects the operation of the hidden curriculum, where silence became a learned survival strategy rather than a reflection of competence.

Theme 3: Institutional Culture and Epistemic Authority

Institutional context strongly influenced how AI-supported knowledge was valued. Public sector institutions were described as authority-centered, while private institutions showed conditional openness depending on consultant attitudes.

Residents learned that acceptance of AI was inconsistent and shaped more by individual supervisors than formal curriculum.

Theme 4: Professional Identity Formation Between Obedience and Evidence

Repeated exposure to authority conflict shaped residents’ professional identities. Many equated professionalism with obedience and compliance, while others expressed frustration at suppressing evidence-based reasoning.

Over time, this tension influenced how residents envisioned themselves as future clinicians and educators.

Table 2. Themes, Subthemes, and Initial Codes

Theme	Subthemes	Codes For example
Clinical Dissonance as a Learning Tension	Cognitive conflict between evidence and instruction	<i>Evidence vs authority, epistemic uncertainty, dual standards, conflicting protocols</i>
	Emotional discomfort during decision-making	<i>Anxiety, fear of error, stress, emotional suppression</i>
Hierarchy, Assessment, and Silence	Fear of negative evaluation	<i>Assessment anxiety, impression management, silence, fear of repercussions</i>
	Learning through the hidden curriculum	<i>Unwritten rules, observational learning, normalization of silence, conformity</i>

Institutional Culture and Epistemic Authority	Authority-centered culture	<i>Consultant supremacy, tradition over technology, resistance to AI, senior dominance</i>
	Conditional acceptance of AI	<i>Selective openness, inconsistent adoption, consultant-dependent learning, symbolic use</i>
Professional Identity Formation	Obedience as professionalism	<i>Compliance, conformity, survival strategies, role modeling</i>
	Erosion of scientific confidence	<i>Self-doubt, reduced autonomy, suppressed reasoning, hesitation</i>
	Aspiration for balanced authority	<i>Algorithmic humility, reflective resistance, integrative thinking, future consultant ideals</i>

Discussion

This qualitative study explored how dental residents in Peshawar experience and navigate conflicts between AI-generated clinical recommendations and consultant expertise within postgraduate training. From a health professions education perspective, these conflicts represent educationally significant moments that shape learning, professional identity formation, and engagement with evidence-based practice.

AI–Authority Conflict as an Educational Phenomenon

The findings indicate that AI–consultant disagreements are not perceived by residents as simple technical discrepancies but as learning tensions embedded within workplace-based education. Similar concerns have been raised in medical education literature, where AI-driven decision-support tools challenge traditional epistemic hierarchies and destabilize established supervisory authority structures [1–4].

AI systems introduce a form of *algorithmic authority* grounded in data and standardization, which may conflict with experience-based clinical judgment [5,6]. Without explicit educational framing, trainees are left to independently reconcile these competing knowledge sources, often under conditions of time pressure and assessment anxiety [7,8]. This aligns with prior research suggesting that AI adoption without curricular guidance may increase learner uncertainty rather than enhance clinical reasoning [9,10].

Emotional Dimensions of Learning in AI-Enhanced Clinical Environments

Residents in this study reported emotional discomfort, anxiety, and moral unease during authority conflicts. These findings support emerging evidence that AI integration affects not only cognitive learning but also **affective dimensions of training**, including confidence, psychological safety, and professional self-efficacy [11–13].

Medical education research increasingly recognizes emotions as central to workplace-based learning [14]. When learners perceive that questioning authority may threaten evaluation outcomes, emotional suppression becomes a coping strategy. Such suppression can hinder reflective learning and contribute to burnout and disengagement [15,16].

Hierarchy, Assessment, and the Hidden Curriculum

A central finding of this study is the role of hierarchy and assessment in shaping silence. Residents consistently described consultants as both supervisors and assessors, reinforcing power asymmetries that discouraged evidence-based dialogue. This phenomenon is well documented in medical

education literature on the **hidden curriculum**, which highlights how informal norms and power structures shape learning beyond formal curricula [17–20].

The overlap between teaching and assessment roles has been identified as a key barrier to psychological safety in clinical education [21]. Our findings extend this literature by demonstrating how AI-related disagreements further intensify silence, reinforcing conformity and discouraging critical inquiry [22].

Institutional Culture and Epistemic Authority

Differences between public and private institutions underscore the influence of **institutional learning climates** on epistemic authority. Authority-centered cultures privileged consultant experience over algorithmic evidence, while private institutions demonstrated selective openness depending on individual faculty attitudes.

Previous studies emphasize that adoption of educational innovations depends more on organizational culture than technological availability [23–25]. In health professions education, inconsistent epistemic standards can lead to fragmented learning experiences and confusion about professional expectations [26].

Professional Identity Formation in the Context of AI

Perhaps the most significant contribution of this study lies in its implications for **professional identity formation (PIF)**. Residents described gradually internalizing obedience and compliance as markers of professionalism, often at the expense of critical reasoning.

Medical education literature conceptualizes PIF as a socially constructed process shaped by repeated workplace interactions rather than explicit teaching [17,27,28]. When evidence-based reasoning is repeatedly suppressed, trainees may equate professionalism with silence rather than reflective judgment. This tension has been reported across multiple health professions and is associated with reduced autonomy and diminished scholarly identity [29,30].

Encouragingly, several residents articulated aspirations to practice differently as future consultants, reflecting identity negotiation rather than identity foreclosure. This aligns with calls in HPE to cultivate reflective practitioners capable of balancing human judgment with algorithmic input [2,6].

Algorithmic Humility as a Health Professions Education Competency

This study introduces **algorithmic humility** as an essential educational competency. Algorithmic humility involves recognizing the strengths and limitations of both AI systems and human expertise, and engaging in reflective, context-sensitive decision-making.

Recent literature emphasizes that ethical AI integration requires faculty modeling, critical engagement, and explicit discussion of uncertainty [3,9,31]. Embedding algorithmic humility within curricula and faculty development may transform authority conflicts into meaningful learning opportunities rather than sources of distress.

Implications for Health Professions Education

These findings have implications beyond dentistry. As AI becomes embedded across medicine, nursing, and allied health education, similar authority tensions are likely to emerge. Addressing these challenges requires:

- Explicit discussion of epistemic authority and uncertainty
- Faculty development focused on AI literacy and educational leadership
- Redesign of workplace-based assessments to promote psychological safety
- Recognition of AI-related tensions as part of the hidden curriculum

Without such interventions, AI risks reinforcing hierarchical cultures rather than advancing evidence-informed, learner-centered education.

Strengths and Limitations:

This study provides in-depth, context-rich insights into an underexplored educational phenomenon. The use of purposive maximum variation sampling across multiple institutions enhances the transferability of findings.

However, the study was limited to dental residents within a single geographic region. Additionally, as data were collected within a defined six-month period, findings reflect experiences within that timeframe. Future studies may benefit from longitudinal designs and inclusion of faculty perspectives.

Conclusion:

This study demonstrates that conflicts between AI-generated recommendations and consultant expertise represent important educational challenges in postgraduate dental training. Dental residents experience these situations as learning dilemmas shaped by hierarchy, assessment pressure, and the hidden curriculum, which influence professional identity formation and willingness to engage with evidence-based reasoning. Addressing these tensions through faculty development, psychological safety, and reflective engagement with AI is essential for preparing confident and evidence-informed clinicians in health professions education.

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