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Transforming Dental Education through Learning: A Dual Focus on General Dentistry and Human Disease

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ABSTRACT

Background: Chairside teaching remains an essential, though often underemphasized, component of clinical dental education. It facilitates experiential learning and real-time integration of theory with practice, particularly in clinics.

Aim: To explore dental students' perceptions and experiences of chairside teaching during their clinical years, with particular emphasis on learning related to both general dentistry and human disease.

Methods: An anonymous online survey was conducted among dental students in Years 3 to 5. The survey captured student insights into clinical settings, the nature of teaching interactions, and the educational value of chairside learning, particularly its role in enhancing knowledge of systemic conditions.

Results: Among 200 students over three years, Oral Medicine and Endodontics were top-rated for chairside learning. Middle-grade supervisors were key to clinical development and support. Students valued one-on-one guidance and open, question-friendly environments.

Conclusion: Chairside teaching, particularly when delivered in a one-on-one and supportive manner, significantly enhances clinical learning. The study underscores the effectiveness of departments like Oral Medicine and Endodontics in integrating both dental and medical education. Middle-grade clinicians played the most impactful role in delivering this type of education.

INTRODUCTION

Learning at the patient's side has long been the heart of medical and dental education. As far back as ancient times, Hippocrates was known to teach his students directly in the presence of patients — a tradition that carried on through the centuries, notably by Herman Boerhaave in 17th-century Europe[3]. Later, Sir William Osler championed this hands-on approach, famously saying that true education happens where patient care is delivered[6].

In dentistry, this form of experiential learning became what we now call chairside teaching. Long before formal dental schools existed, students trained by observing and assisting skilled practitioners[4]. Although dental education has changed significantly over time, chairside teaching still plays a vital role. It allows students to develop clinical skills, sharpen their decision-making, and grow into confident professionals — all while engaging with real patients in real-time situations[1].

Today's dental education spans lecture halls, simulation labs, and — most importantly — the clinic. It's in this clinical space that students can ask questions on the spot, watch theory come to life, and receive feedback that can't be replicated in a classroom. However, because chairside teaching often happens informally and spontaneously, it's not always consistently evaluated or recognized[7].

This study explores how dental students experience and perceive chairside teaching. In particular, it looks at how these moments enhance their understanding of both general dental practice and broader systemic human diseases[1].

Aims and Objectives

Clinical encounters with patients who have complex medical conditions offer dental students a unique lens through which they can better grasp the connections between oral and systemic health[7–9]. Learning that takes place chairside—directly in the clinical setting, alongside real patients—offers a valuable opportunity to apply theoretical knowledge in real-time, helping students grow both in confidence and competence[14–16].

The purpose of this study was thre"fold'

1. To gain insight into how students engage with and interpret chairside learning during their clinical training[14–16].
2. To determine which departments and teaching staff are perceived as the most effective and supportive in facilitating this learning[14,15].
3. To assess the extent to which chairside experiences contribute to students' understanding of both dental procedures and broader medical conditions[7–9,17–20].

By examining these aspects, we aim to highlight the value of patient-based learning in shaping dental graduates who are clinically skilled, medically aware, and ready to meet the evolving needs of healthcare[1,7,8].

MATERIALS AND METHODS

Study Design and Ethical Approval

An anonymous, ethics-approved survey (DSREC 2209A) was conducted among third- to fifth-year undergraduate dental students. The survey was voluntary, and participation implied informed consent.

Survey Distribution

The survey link was shared via email and QR-coded posters placed throughout the clinical areas. It was open for four weeks during the spring term—timed to coincide with peak clinical exposure. Reminder emails were sent in the third week to boost response rates.

Survey Content

The survey explored the following themes:

- Clinical departments where chairside learning was most effective.
- The perceived contribution of different staff groups.
- Student reflections on how chairside teaching improved their understanding of human disease and dentistry.

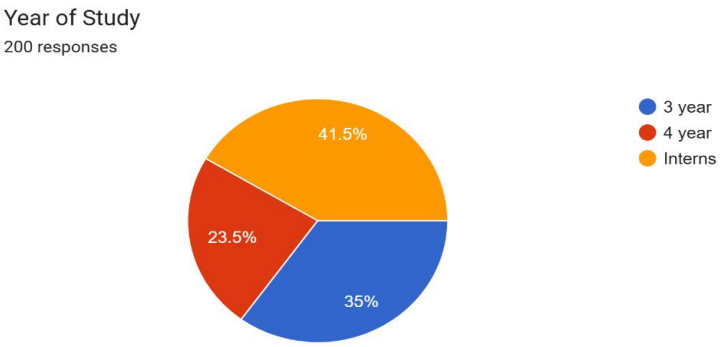
We used a mix of question types: Likert scales, multiple-choice options, and open-ended fields. "Chairside teaching" was defined as spontaneous, real-time learning during clinical care, including procedural guidance and feedback.

RESULTS

Student Participation

Out of 200 students who responded, the majority were interns — around 41.5%. Third-year students made up about 35%, and fourth-year students contributed 23.5%. This indicates strong engagement across all clinical years.

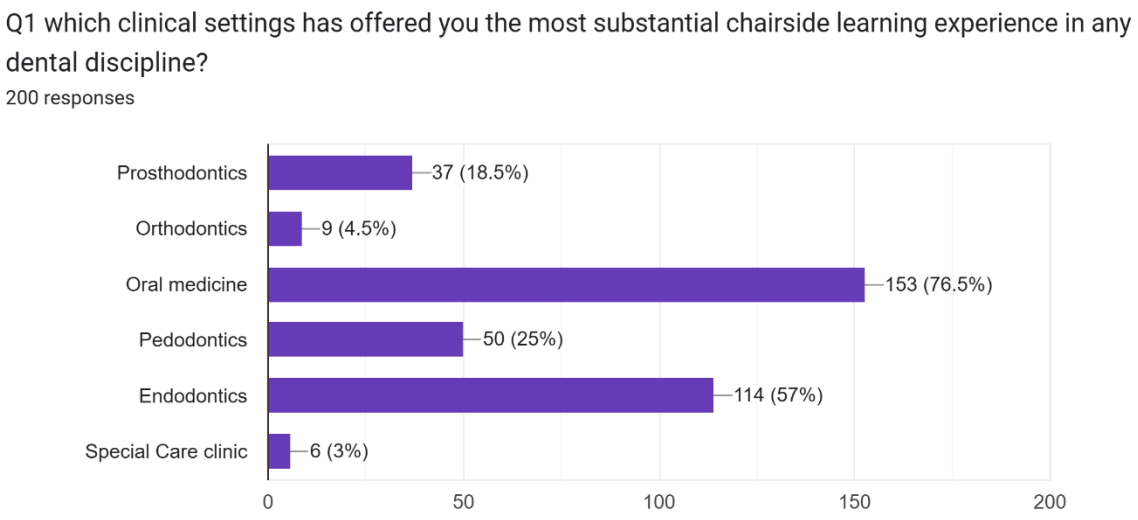
Middle-grade supervisors and clinicians were seen as the most engaged and helpful in delivering chairside teaching. Overall, students felt that chairside teaching greatly supported their understanding of both dental topics and human diseases, reinforcing its importance in clinical training.



Out of the 200 students who responded, the majority were interns — around 41.5% — showing that those in their final, hands-on training year were the most actively involved.

Next, we had third-year students making up about 35% of the responses. This reflects strong engagement from students who are just stepping into clinical exposure.

Fourth-year students contributed 23.5%, showing a slightly lower but still meaningful level of participation.
Overall, the responses show good representation across all senior academic years, with interns being the most responsive group — likely due to their closer connection to real-time clinical activities and learning."



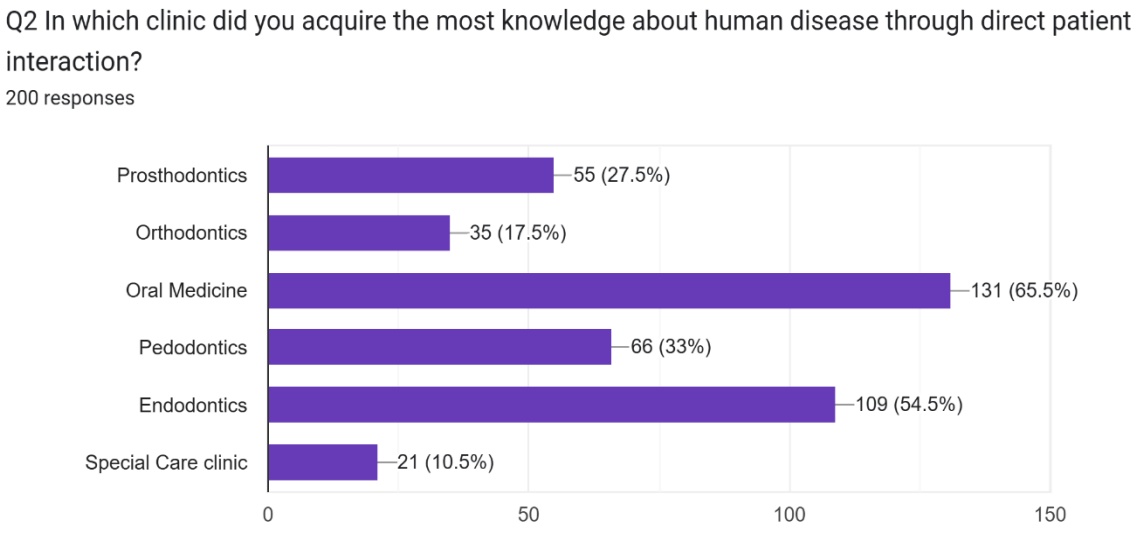
From the 200 students who responded, a large majority- 76%-reported that Oral Medicine clinics offered them the most valuable chairside learning experience. This suggests that students found these clinics rich in diagnostic exposure, patient interaction, and clinical discussions.

Following this, Endodontics was highlighted by 57% of students, indicating its strong hands-on training opportunities and practical relevance in daily dental care.

Other departments contributed to learning, though to a lesser extent:
Pedodontics was selected by 26%, reflecting the benefits of engaging with younger patients and behaviour management techniques.

Prosthodontics came next with 19%, possibly due to its involvement in treatment planning and patient rehabilitation.
Orthodontics has a lower selection at 4.5%, likely due to limited procedural exposure during student postings.

Special care Clinics were chosen by 3% which may indicate fewer students-patients interaction or limited rotation opportunities in that setting.



When asked which clinic helped them understand human diseases the most through direct patient interaction, Oral Medicine emerged as the top choice, with 66% of students (approx.132 out of 200) selecting it. This suggests that

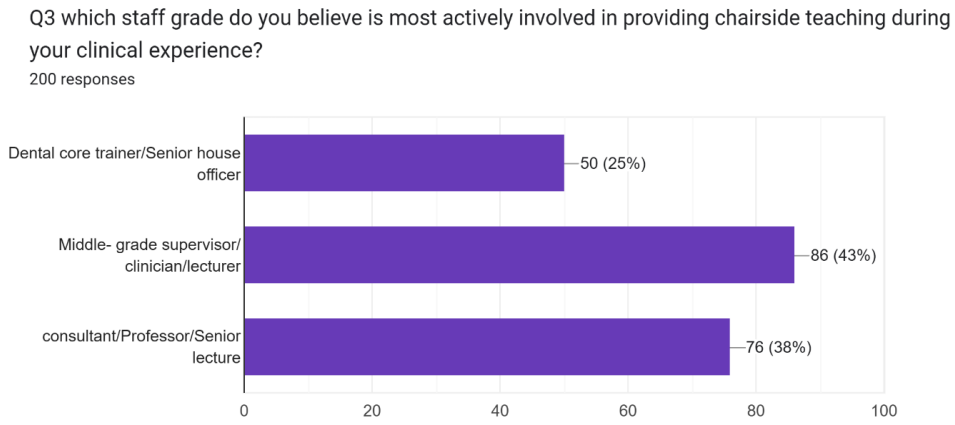
students found Oral Medicine highly beneficial for learning about systemic conditions, case history-taking, and diagnostic approaches.

Endodontics was the Second most impactful clinic, with 54% of respondents highlighting it. The hands-on nature of treating infected root canals likely gave students real insight into disease processes and pain management.

Other clinics where students gained valuable learning included:
Pedodontics- chosen by 33%, showing that managing children with various dental issues also contributed to broader clinical understanding.

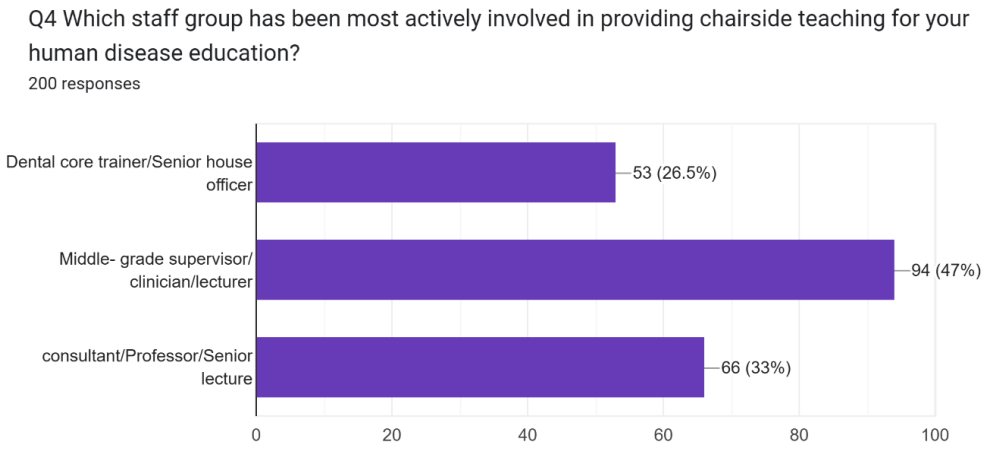
Prosthodontics- selected by 27%, possibly due to its focus on rehabilitative care and patient evaluation.
Orthodontics- marked by 17.5% suggesting limited disease-related interaction, likely due to its focus on long term treatment planning.

Special care Clinics- chosen by 10% showing that while fewer in number, these clinics offered unique insights into managing patients with complex medical histories or disabilities.



When asked which staff played the most active role in chairside teaching during clinical training, students identified Middle-grade supervisors/ clinicians/ lecturers as the most involved group. They were selected by 43% of respondents, reflecting their approachability for real-time guidance. Close behind, consultants, professors, and senior lecturers were recognized by 39% of students. Their involvement, although slightly less frequent, likely brought depth through their expertise and advanced clinical insights. Dental core trainers or senior house officers were chosen by 25% of students. while they may not always lead clinics, their recent training experience and relatability might make them effective teachers for students earlier in their clinical journey.

These results show that teaching is a collaborative effort across all staff grades, but students tend to benefit most from consistent, hands-on mentorship-often provided by middle-grade clinicians who bridge both accessibility and experience.

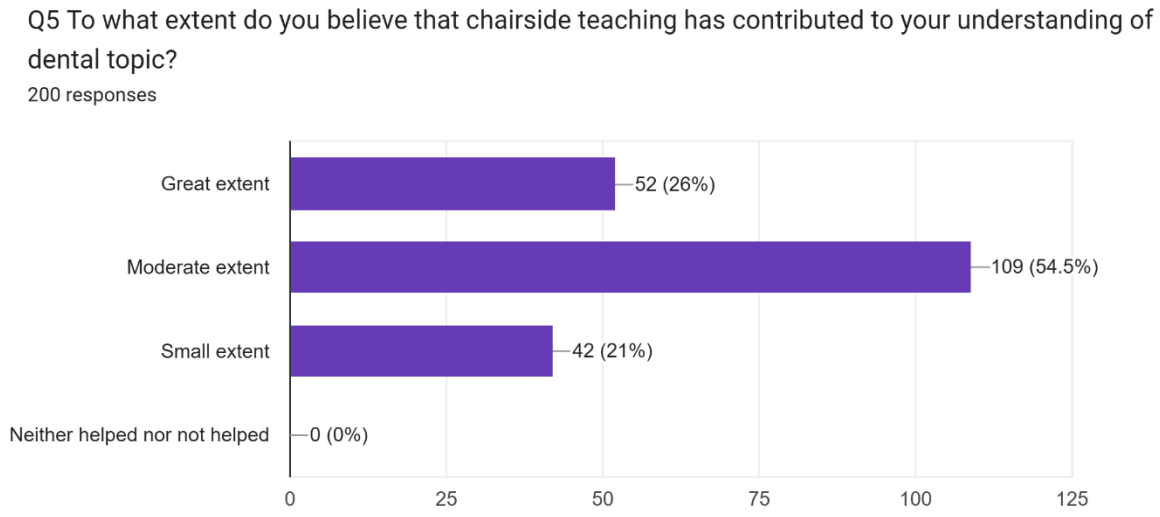


When asked which staff group contributed most to their learning about human diseases through chairside teaching, 46.5% of students identified middle-grade supervisors, clinicians, or lecturers as the most engaged. This reflects their consistent presence and active role in guiding students during patient interactions involving systemic conditions.

Senior faculty members such as consultants, professors, or senior lecturers, were recognized by 34% of respondents. Their deeper expertise and occasional focused discussions likely left a meaningful impression, especially in complex clinical scenarios.

Meanwhile, dental core trainers or senior house officers were mentioned by 26% of students. Their relatively recent academic experience and approachability may have made them particularly supportive, especially for junior students navigating early clinical exposure.

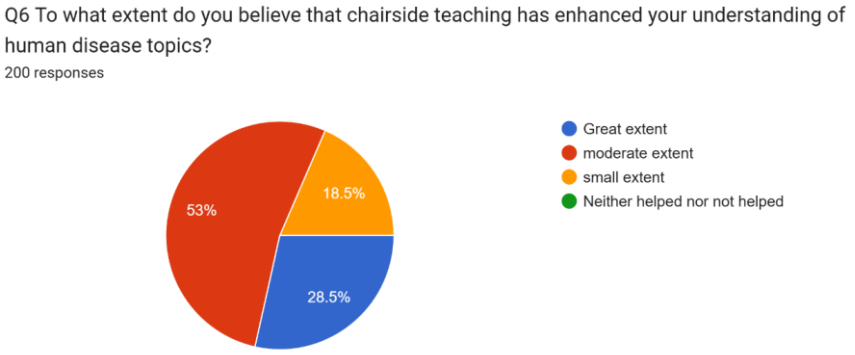
Overall, the results highlight that while all levels of staff contributed to clinical learning, middle-grade clinicians appear to offer the most frequent and practical chairside teaching related to human disease education.



Over half of the respondents- around 54%- shared that it contributed to a moderate extent, indicating that they found it reasonably beneficial in reinforcing clinical concepts.

Meanwhile, approximately 27% of the participants expressed that chairside teaching helped them to a great extent, showing a strong endorsement for its role in hands-on learning and real-time clarification of doubts.

A smaller portion- about 21%- felt it helped them to only a Small extent, suggesting they may have faced barriers such as limited exposure, less interactive sessions, or dependence on theoretical methods.

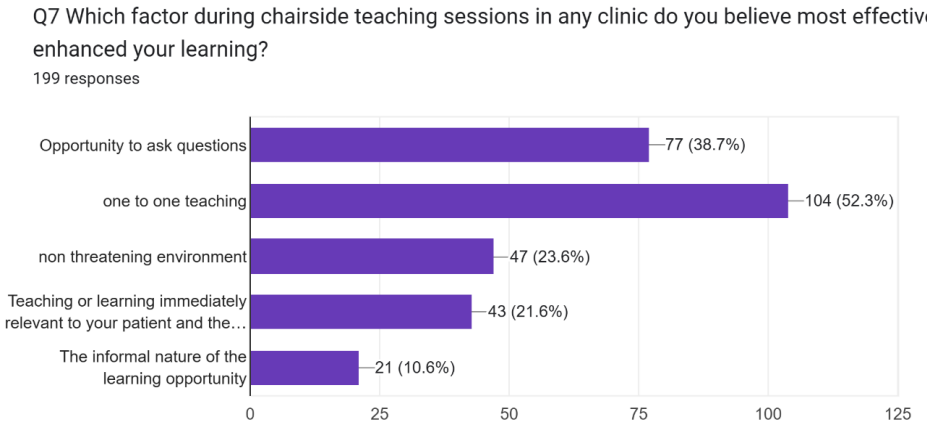


When students were asked how much chairside teaching helped improve their understanding of human disease topics, the feedback was strongly positive.

Over half 52.5% of the students felt that chairside teaching enhanced their understanding to a moderate extent. Nearly one-third 29.2% believed it helped to a Great extent, showing that a significant portion of learners deeply benefited from practical exposure during clinical sessions.

18.3% said it helped to a small extent, suggesting room for improvement in how sessions are delivered or structured. Notably, none of the respondents selected 'neither helped nor not helped', indicating that virtually all students found at least some value in the experience.

These results highlight the overall effectiveness of chairside teaching in supporting medical and dental students' understanding of real-world disease presentation through direct patient interaction.



The majority -52%-highlighted one-to-one teaching as the most impactful. This suggests that personalized attention and direct guidance from clinical teachers greatly boost understanding and confidence during patient care.

The opportunity to ask question was the next most valued aspect. Selected by 38% of respondents. Students appreciated having an open, interactive environment where they could clarify doubts in real time.

Other contributing factors included:

- A non- threatening environment-
  Chosen by 24%, showing that psychological safety plays a key role in making students feel comfortable and engaged.
- Immediate teaching or feedback during procedures-
  noted by 22% emphasizing the value on-the-spot correction and contextual learning.
- The informal nature of the learning- mentioned by 10%, indicating that less structured but approachable interactions still contributed meaningfully to student growth.

  These findings shows that students thrive best in environments where they receive individual attention, feel free to engage, and are encouraged in a supportive clinical settings.

DISCUSSION

Findings from 200 students strongly reinforce the value of chairside teaching in undergraduate dental education. Among the clinical departments, Oral Medicine consistently stood out—students rated it highest for learning both dental concepts and systemic disease understanding. This could be attributed to the diagnostic nature of the specialty and the diversity of patients encountered[7–8]. Endodontics followed closely, offering hands-on training in technical skills alongside exposure to complex treatment planning and disease management[1].

When it came to teaching personnel, students most frequently highlighted middle-grade supervisors—such as clinical lecturers and registrars—as the most influential educators[12–13]. This may reflect their day-to-day accessibility and the enthusiastic, approachable teaching styles they often bring to the clinic. These findings echo previous studies emphasizing that mid-level clinicians are often the most engaged and effective mentors in clinical settings[15].

Students particularly appreciated one-on-one teaching, opportunities to ask questions, and immediate, constructive feedback. These elements helped create a supportive learning environment, which aligns with educational literature suggesting that psychological safety and real-time application enhance learning retention and confidence[14],[16–18].

Some departments—such as Orthodontics and Special Care Dentistry—were perceived as offering less impactful chairside experiences. These areas might benefit from reassessing their student engagement strategies to foster more interactive clinical teaching. The positive outcomes seen in Oral Medicine demonstrate that integrating general

medicine into dental education doesn't need to happen only in the lecture hall—it can be deeply effective at the chairside, in everyday clinical encounters[7,9,17–20].

CONCLUSION

These findings clearly show how valuable chairside teaching is to dental students' learning journeys. Students not only gained practical skills but also deepened their understanding of human disease through meaningful patient interactions—especially in Oral Medicine and Endodontics clinics. The role of approachable, engaged teaching staff—particularly middle-grade supervisors—stood out as a key factor in creating a supportive learning environment.

What mattered most to students wasn't just the clinical content, but how it was delivered. One-on-one teaching and the ability to ask questions freely made the experience more personal, interactive, and impactful. Overall, chairside learning continues to be a vital part of clinical education, helping bridge the gap between theory and real-life practice in a way that truly resonates with students.

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