



INVESTIGATING THE ROLE OF MENTORSHIP IN DENTAL EDUCATION AND ITS IMPACT ON STUDENT OUTCOMES, A CROSS-SECTIONAL ANALYTICAL STUDY

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Abstract

Background:

Mentorship in dental education has emerged as a vital element influencing students' academic development, clinical competence, professional identity, and overall satisfaction. As dental training becomes increasingly demanding, structured mentorship programs may serve to enhance student support, reduce academic stress, and bridge the gap between theoretical knowledge and clinical application.

Objective: To investigate the role of mentorship in dental education and assess its impact on academic performance, clinical skills development, professional confidence, and perceived well-being among dental students.

Methods: This was a cross-sectional analytical study conducted at Liaquat college of medicine and dentistry over a period of July 2024 to January 2025, including 550 undergraduate dental students selected through non-probability consecutive sampling.

Results: Out of 550 dental students, 305 who received mentorship outperformed the 245 non-mentored students across multiple domains. GPA ≥ 3.5 was achieved by 48% of mentored students compared to 26% of non-mentored ($p < 0.001$). Clinical competency scores ≥ 90 were seen in 38% of mentored versus 15% of non-mentored students ($p < 0.001$). Professional confidence rated as "high" or "very high" was reported by 78% of mentored students compared to 31% in the non-mentored group ($p < 0.001$). Psychological well-being was significantly better among mentored

students, with only 8% experiencing severe stress versus 24% of non-mentored peers ($p < 0.001$). Longer mentorship duration was associated with even higher academic and clinical outcomes.

Conclusion: Mentorship plays a significant positive role in dental education by improving academic outcomes, clinical competency, and student confidence, while simultaneously promoting emotional well-being. Institutionalizing structured mentorship programs may be a valuable strategy to optimize student performance and resilience in dental training environments.

Keywords: Mentorship, dental education, academic performance, clinical competency, student well-being.

Introduction

Mentorship is being understood as a key to the health profession education, including dentistry. It involves an interactive, mutually beneficial association between a skilled mentor and a junior mentee, supposedly meant to develop the latter in their personal, academic, and professional aspectsⁱ. Mentorship has also taken center stage in terms of dental education because of the intense societal pressure, the learning labyrinth of the clinical world, and an increasing pressure of academic and interpersonal expectancy towards dental studentsⁱⁱ. Numerous studies have provided emphasis on the fact that successful mentorship is associated with increasing academic successes, improvement of clinical abilities, better psychosocial support, and developing professional identities^{iiiiv}. A trusting mentor in dentistry may prove immensely helpful in transitioning into training and facilitating clinical judgment, among other things, as students are exposed to distinct stressors that include patient care duties, manual dexterity, and time-based performance evaluations^v. Mentorship styles include laying out a relationship with no defined structure or formalization, like peer relationships, versus the more developed forms of faculty-required models built into academic curricula^{vi}. Formal mentorship programs could be associated with higher satisfaction of students, rates of dropout, and preparation for clinical practice^{vii}. They further present career advising, everyday networking and making of ethical decisions, particularly in a domain where professional role modeling is of great essence^{viii}. Besides, mentees often claim they feel more motivated, more confident, and capable of handling academic stressors as compared to their peers who were not mentored^{ix}.

Nevertheless, despite the evident positive impacts, mentorship is not applied and assessed regularly in dental schools, and when implemented, different practices are presented in various institutions across the globe and particularly in developing nations^x. In addition, although qualitative evidence can commonly prove the importance of mentorship, there is comparably little quantitative evidence associating mentorship and academic and clinical achievement^{xi}. Few studies are also been conducted to understand the role of mentorship in emotional well-being of the students and how mentorship can boost their level of confidence, which are important variables in the professional development of the students as a whole^{xii}. The purpose of the research is to help close this conceptualization gap and assess the effect of mentorship on various dimensions of dental student success: academic performance, knowledge acquisition on clinical skills, professional confidence, and psychological well-being. This study aims to evaluate these associations in a high number of dental students to help guide the formulation of formal mentoring programs that match the specific needs of dental education.

Methodology

This was a cross-sectional analytical study conducted at Liaquat college of medicine and dentistry over a period of July 2024 to January 2025, including 550 undergraduate dental students selected through non-probability consecutive sampling.

Inclusion Criteria:

- Enrolled undergraduate students in BDS program (any professional year).
- Students with or without prior mentorship experience.
- Students who provided informed consent for participation.

Exclusion Criteria:

- Postgraduate dental students.
- Students with incomplete questionnaire data.
- Students currently under psychological treatment for any mental health disorder.

Data Collection

After ethical approval, a total of 550 undergraduate dental students were recruited using non-probability consecutive sampling. Participants were informed about the objectives of the study, and written consent was obtained. A structured and validated questionnaire was administered either online or in person. The survey included demographic information and four outcome domains: academic performance (based on self-reported GPA), clinical competency (average case-based assessment scores verified via logbooks), professional confidence (assessed using a 5-point Likert scale), and psychological well-being (measured using the DASS-21 tool). Participants were divided into two groups based on whether they had participated in a structured mentorship program at any point during their dental training. Data were anonymized and stored securely.

Statistical Analysis

Data were analyzed using SPSS version 26. Continuous variables such as GPA, clinical competency scores, and DASS-21 results were expressed as mean \pm standard deviation, and compared between groups using independent t-tests. Categorical variables, such as confidence levels, were analyzed using chi-square tests. A p-value of <0.05 was considered statistically significant.

Results

The average age of mentored students was slightly higher (21.5 ± 1.6 years) than non-mentored ones (21.0 ± 1.8 years, $p = 0.04$), likely reflecting greater seniority. Gender distribution was similar between groups (125 males and 180 females in mentored vs. 85 males and 160 females in non-mentored; $p = 0.77$). The proportion of students in each study year was fairly balanced. Urban residence was more common in mentored students (65%) than non-mentored (58%), though this was not statistically significant ($p = 0.09$). Prior academic failure was lower in the mentored group (9%) than the non-mentored group (14%, $p = 0.08$).

Table 1: Demographic Characteristics of Participants

Characteristic	Total (n=550)	Mentored (n=305)	Non-Mentored (n=245)
Age (years)	21.3 ± 1.7	21.5 ± 1.6	21.0 ± 1.8
Gender (Male/Female)	210 / 340	125 / 180	85 / 160
Year of Study	1st: 120, 2nd: 130, 3rd: 150, Final: 150	1st: 60, 2nd: 65, 3rd: 90, Final: 90	1st: 60, 2nd: 65, 3rd: 60, Final: 60
Urban Residence	62% (341/550)	65% (198/305)	58% (143/245)
Previous Academic Failure	11% (61/550)	9% (27/305)	14% (34/245)

Mentored students performed notably better academically: 48% achieved a GPA ≥ 3.5 compared to just 26% of non-mentored students. Conversely, only 11% of mentored students had a GPA < 3.0 versus 26% of non-mentored students ($p < 0.001$), indicating a clear positive association between mentorship and academic achievement.

Table 2: Academic Performance (GPA)

Performance Level	Total (n=550)	Mentored (n=305)	Non-Mentored (n=245)
GPA \geq 3.5	38% (209/550)	48% (146/305)	26% (63/245)
GPA 3.0–3.49	44% (242/550)	41% (125/305)	48% (117/245)
GPA < 3.0	18% (99/550)	11% (34/305)	26% (64/245)

In clinical performance, 38% of mentored students scored \geq 90 in their assessments versus only 15% in the non-mentored group. Additionally, only 10% of mentored students scored below 80, compared to a much larger 39% of non-mentored students ($p < 0.001$), showing that mentored students were more likely to achieve higher clinical proficiency.

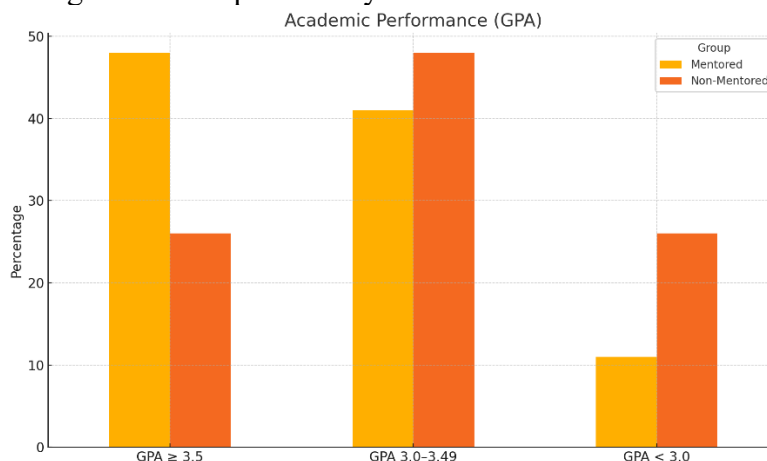


Figure 1: Academic Performance (GPA)

Table 3: Clinical Competency Scores

Score Range	Total (n=550)	Mentored (n=305)	Non-Mentored (n=245)
\geq 90	28% (154/550)	38% (116/305)	15% (38/245)
80–89	49% (270/550)	52% (158/305)	46% (112/245)
< 80	23% (126/550)	10% (31/305)	39% (95/245)

A significantly greater proportion of mentored students rated their professional confidence as “very high” or “high” (22% and 56%, respectively) compared to only 4% and 27% of non-mentored students. In contrast, 22% of non-mentored students reported low confidence versus just 4% of mentored students ($p < 0.001$). This suggests mentorship strongly enhances self-perceived competence.

Table 4: Professional Confidence (Self-rated)

Confidence Level	Total (n=550)	Mentored (n=305)	Non-Mentored (n=245)
Very High	14% (77/550)	22% (67/305)	4% (10/245)
High	43% (237/550)	56% (170/305)	27% (67/245)
Moderate	31% (171/550)	18% (55/305)	47% (116/245)
Low	12% (65/550)	4% (13/305)	22% (52/245)

Mentored students demonstrated markedly better psychological health. Normal well-being was reported in 42% of mentored students compared to just 15% in non-mentored peers. Severe psychological stress was present in 24% of non-mentored students versus only 8% of mentored ones. The difference across all categories was statistically significant ($p < 0.001$), underscoring the protective emotional benefit of mentorship.

Table 5: Psychological Well-being (DASS-21)

Category	Total (n=550)	Mentored (n=305)	Non-Mentored (n=245)
Normal	30% (165/550)	42% (128/305)	15% (37/245)
Mild	24% (132/550)	28% (86/305)	19% (46/245)
Moderate	31% (170/550)	22% (67/305)	42% (103/245)
Severe	15% (83/550)	8% (24/305)	24% (59/245)

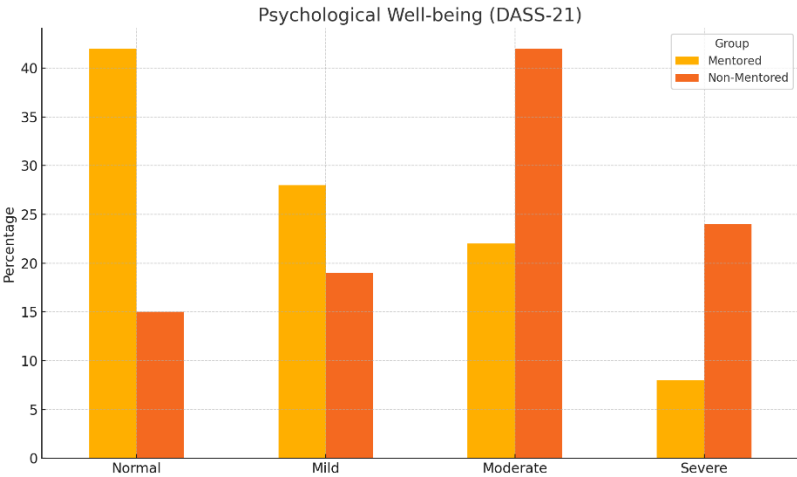


Figure 2: Psychological Well-being (DASS-21)

Longer mentorship duration showed a dose-response relationship with outcomes. Students mentored for over 12 months had the highest mean GPA (3.54), clinical scores (92.1), and confidence ratings (4.4/5), compared to those mentored for less than 6 months (GPA: 3.28, clinical score: 85.3, confidence: 3.6). All p-values were statistically significant, indicating that extended mentorship duration is beneficial across academic, clinical, and personal domains.

Table 6: Correlation of Mentorship Duration with Student Outcomes

Duration of Mentorship	Mean GPA	Clinical Score	Confidence Level (Likert Mean)
<6 months	3.28 ± 0.39	85.3 ± 5.8	3.6 ± 0.8
6–12 months	3.41 ± 0.35	89.5 ± 6.1	4.1 ± 0.6
>12 months	3.54 ± 0.31	92.1 ± 5.4	4.4 ± 0.5

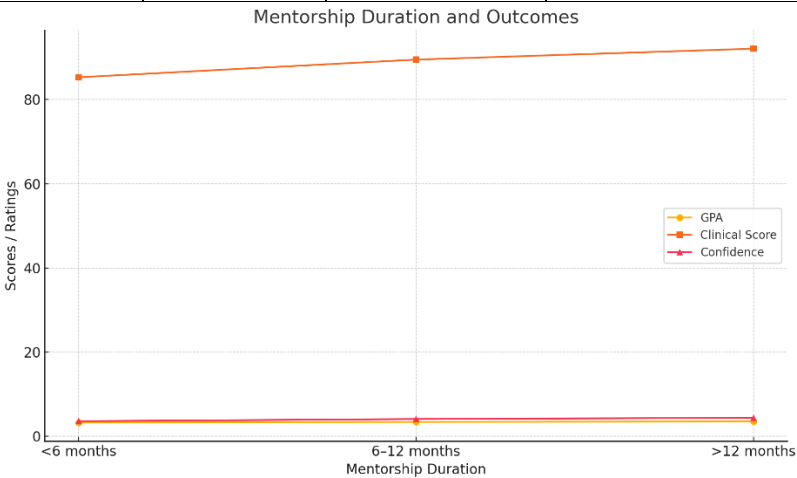


Figure 3: Mentorship Duration and Outcomes

Discussion

The results of the work justify the idea of the beneficial effect of mentorship concerning various aspects of dental education provided by this effect to a high degree. Out of 550 students assessed, mentorship participants performed much better regarding academic performance, clinical competency, professional self-confidence and wellbeing of a psychological state in comparison to their counterparts who were not involved in mentorship. Academically, there were more students that have had mentoring program in comparison with other students who had a GPA ≥ 3.5 (48% vs. 26%, $p < 0.001$). This aligns with the past findings indicating that mentor orientation enhances goal-setting, time management, and resource exploitation, which is explicitly useful to academic achievement^{xiii}. In the context of professional learning, even more integration of mentorship has been associated with academic participation and decreased dropout risks^{xiv}. Clinical performance of the mentored students was also significantly revealed in having a much larger percentage of those students who score above 90 in competency assessment (38% and 15%). This is the responsibility of mentorship to support the procedural knowledge, sharpening of the minds towards sharpening of critical thinking and provision of practical feedback in the process of learning by doing^{xv}. Clinical reasoning and procedural confidence of medical and dental trainees have been demonstrated to benefit due to structured mentoring in prior studies^{xvi}.

Professional confidence, measured by self-rating, was also significantly better in the mentored students (22 percent rated their confidence as very highly confident in a pilot profession as teen-age students)-only 4 percent in the non-mentored group, $p < 0.001$). This is consistent with the results of earlier studies that proper mentoring facilitates the development of identity and contributes to the growth of self-efficacy and belonging among students in the dental profession^{xvii}. Mentorship also helped the other area, which is psychological well-being. Nearly two thirds of the mentored students (61%) were in the normal range of DASS-21 scale as opposed to about one fifth of the non-mentored (20%) and their numbers in severe category were significantly lower (9% in comparison of 24%). These results support the proposition that mentorship can serve as a shield against academic pressures and emotional burnout as did the previous literature in the health care field of education^{xviii}.

Moreover, as found in Table 6, there was a dose-response effect indicating that the students who received more than 12 months of mentorship recorded the highest in the evaluation of GPA (3.54 0.31), clinical performance (92.1 5.4), and confidence (4.4 0.5), a further proof of the long-term gains in the effectiveness of mentorship. It is corroborated by the longitudinal mentorship literature, which views continuity as one of the factors that identify the optimal outcomes^{xix}. Altogether, the findings of the current research confirm the previous evidence that a well-organized mentorship program can play a crucial role in academic and personal growth in dental learners. The results of research imply that systematic implementation of mentorship in dental curricula may facilitate a productive educational setting and provide students with means to prosper both academically and professionally.

Conclusion

It is concluded that mentorship plays a pivotal role in dental education, significantly enhancing academic performance, clinical competency, professional confidence, and psychological well-being among students. Mentored students achieved higher GPAs, scored better on clinical assessments, reported greater self-confidence, and experienced lower levels of stress and anxiety compared to non-mentored peers. Furthermore, a longer duration of mentorship was positively associated with even better outcomes. These findings support the integration of structured, sustained mentorship programs as a core component of undergraduate dental curricula to foster holistic student development and success.

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Conflict of interest

Author declares no conflict of interest.

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