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Assessment of Stress Levels and Coping Strategies Among Students at a Dental School in Southern California

Dima Ibnian, DDS[a], Axel Barba, DDS[a], Sara Mojtahedi, DDS[a], Debra Friesen, MS, RDH[b], Udochukwu Oyoyo, MPH[c], and So Ran Kwon, DDS, MS, PhD, MS[a]

[a]Division of General Dentistry, Loma Linda University School of Dentistry, Loma Linda, California, USA; [b]Department of Dental Hygiene, Loma Linda University School of Dentistry, Loma Linda, California, USA; [c]Dental Educational Services, Loma Linda University School of Dentistry, Loma Linda, California, USA

ABSTRACT

Objective: The purpose of this study is to assess stress levels among dental students at a dental school in Southern California and identify major stressors and common coping strategies utilized by students.

Materials and Methods: A cross-sectional survey was distributed to dental students from the classes of 2025–2028 (N = 464). The 32-item survey included demographics, Dental Environment Stress (DES) questionnaire, and questions on stress coping strategies. The DES questionnaire rates 24 academic, clinical, social, and personal stressors on a five-point Likert scale (1 = not stressful to 5 = highly stressful), yielding total scores from 24 to 120. Quantitative data were analyzed using descriptive statistics, t-tests, and correlation analyses. Open-ended responses were thematically analyzed to identify perceived needs for institutional support.

Results: A total of 218 students responded (response rate: 46.9%). Mean DES score was 55.5 (SD = 18.7), with no statistically significant difference between males and females (p = 0.090). Top stressors included examinations and grades (mean = 3.5), patient care responsibilities (mean = 3.1) and amount of classwork (mean = 3.0). Common coping strategies were socializing (73.9%), hobbies (66.1%), and physical activity (63.8%). Higher use of coping strategies was significantly associated with higher stress (r = 0.562, p < 0.001). Students who perceived institutional resources more favorably also reported lower stress levels (r = −0.272, p < 0.001). Open-ended responses emphasized the need for free food and snacks, mental health services, academic flexibility, and social support.

Conclusion: Dental students experience moderate to high stress, primarily from academic and clinical sources. While personal coping strategies help reduce stress, students also identified a need for enhanced institutional support.

Practical Implications: Enhancing access to institutional mental health resources and fostering supportive environments could not only improve students' immediate well-being but also prepare them for long-term success and emotional resilience in their professional careers.

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Introduction

Dentists experience significant stress that begins in dental school and continues throughout their professional careers, often leading to burnout, anxiety, and depression.[1–3] The high-risk nature of clinical practice, due to close work with the oral cavity, combined with common personality traits in the dental profession, makes dentists particularly vulnerable to mental health challenges.[1] The stress burden is further aggravated by high patient expectations, regulatory demands, fear of litigation, and work-related pressures, all of which can escalate exhaustion and frustration.[3,4] To mitigate these effects, strategies such as breathing exercises, emotional awareness, mentorship programs, and resilience-building activities have been suggested as effective interventions.[2] Recognizing these stressors and acquiring effective stress management skills early in their careers – especially during their student years – is essential for guarding the mental and physical well-being of dental professionals while ensuring high-quality patient care.

Given that the stressors of dentistry generally develop during dental school, it is important to recognize how the academic and clinical environment impacts students' stress levels and potentially carry over into their professional careers. Throughout their education, dental students face significant stress from demanding coursework, examinations, and clinical training. Many studies utilized the Dental Environment Stress (DES) questionnaire that was developed by Garbee and colleagues to measure the perceived sources of stress among dental students.[5] Studies systematically reviewing this phenomenon indicated that major stress contributors include academic performance pressure and interactions with faculty and administration.[6,7] Moreover, higher levels of stress have been noted among female students and those in later academic

CONTACT So Ran Kwon sorankwon@llu.edu
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years. Despite the well-documented stress burden, limited research exists on effective coping strategies. While some studies explored burnout symptoms and coping strategies, including health-promoting behaviors and maladaptive responses, there is still a need for structured and effective mechanisms.[8,9] Resilience has been highlighted as a crucial factor influencing burnout and well-being, yet evidence on targeted programs to enhance resilience remains scarce.[10,11] Chronic stress not only affects the personal well-being of students but also has implications for patient care quality, highlighting the importance of effective stress management strategies within dental education.[12] As such, further research is necessary to develop effective stress management interventions tailored to dental students' needs.

The purpose of the study was to assess stress levels among dental students at a Dental School in Southern California, identify major stressors, and assess common coping strategies utilized by students. We hypothesized that stress levels would not differ by gender and that it would correlate with the adoption of effective stress management strategies.

Materials and Methods

Study Design & Research Compliance

This study used a cross-sectional study design through the distribution of an anonymous survey. The research study was determined to be exempt from oversight by the Institutional Review Board at Loma Linda University in Loma Linda, California, USA (IRB #5240601).

Setting & Survey Distribution

A hard-copy survey was distributed by the student investigators over two months, from Jan. 7 to February 28, 2025, with permission from course directors to administer it at the end of class sessions. The survey included a cover letter explaining the study's purpose and assuring students that participation was voluntary and would not affect their academic standing or grades. To minimize the already low risk of a confidentiality breach, a drop-box was provided for anonymous submission.

The survey utilized in this study consisted of 32 items divided into three sections to assess the stressors, stress levels, and coping mechanisms among dental students. The first section collected demographic information, including age, gender, race, and ethnicity. The second section incorporated the dental environment stress (DES) questionnaire, in which participants rated 24 potential stressors related to academic, clinical, social, and personal factors on a five-point Likert scale. Responses ranged from Not Stressful (scored as 1) to Highly Stressful (scored as 5), resulting in a total possible stress score ranging from 24 to 120. The third section focused on stress management strategies, allowing students to indicate their preferred coping mechanisms, the effectiveness of specific techniques during high-pressure situations, and their perceptions of institutional support. Additionally, an open-ended question was included to allow students to suggest additional resources the school could provide that would be helpful for stress management. The questions in the third section were developed by the authors (Appendix I). Out of the 464 surveys distributed, any that were returned empty were excluded from the study.

Participants

Inclusion criteria included dental students of the classes of 2025 (N = 132), 2026 (N = 132), 2027 (N = 100), and 2028 (N = 100) at the dental school aged 18 years and older who can read and understand English. Students in the dental hygiene program were excluded from the study.

Sample Size Calculation

The sample size calculation was based on the DES score, detecting a medium effect size (Cohen's w = 0.4) with 80% power and a significance level of 0.05, using a Chi-Square test for gender differences. To assess whether stress levels differ by gender, we required a total of 200 participants with 100 for each gender. To meet the requirements a total of 464 hard copies were distributed.

Data Analysis

Summary statistics (frequencies, percentages) were used to characterize the distribution of responses among the full sample. Missing data were assessed for patterns and proportion. Variables with less than 5% missing values were imputed using the mode. Additionally, Mann-Whitney U test was used to assess stress level difference between male and female students, and Pearson's correlation analyses were used to determine correlations between stress level and number of coping strategies employed. Statistical significance was set at $p < 0.05$. Analyses were conducted using R and Jamovi statistical software.[13] Open-ended survey responses were analyzed using thematic analysis. Responses were reviewed for clarity and relevance, and initial codes were assigned to meaningful text segments. These codes were then grouped into subthemes based on conceptual similarity. An Excel spreadsheet was used to organize coded data, categorize subthemes, and calculate the frequency of occurrence for each subtheme across responses.

Results

Demographics

Out of a total of 464 dental students 218 participants completed the survey (response rate: 46.9%). The average age was 27.8 years (SD = 4.9), ranging from 20 to 56 years. The gender was evenly distributed consisting of 53.7% males and 46.3% females. For racial composition, the majority were Asian (54.5%), followed by white (36.4%), African American (7.2%), and a small percentage of American Indian or Alaskan Native (1%) and Native Hawaiian or Pacific Islander (1%). A minority of participants, 14.5%, identified themselves as Hispanic, whereas the majority, 85.5%, were non-Hispanic.

DES Questionnaire

The mean DES score was 55.5 (SD = 18.7), with scores ranging from 24 to 120. The average score for male participants was 53.6 (SD = 18.6) and for female participants 57.9 (SD = 18.6). The DES scores were not normally distributed (Shapiro-Wilk test, $p < 0.001$). The difference in DES scores between the two groups was not statistically significant (Mann-Whitney U test, $p = 0.090$). A summary of responses from the DES questionnaire, including the frequency of responses by item, mean scores and standard deviation for 24 items related to sources of stress is presented in Table 1. Scores range from 1 (Not Stressful) to 5 (Highly Stressful). The findings showed that the highest levels of stress were associated with examinations and grades (mean = 3.5), followed by patient care responsibilities (mean = 3.1) and the amount of classwork (mean = 3.0), suggesting that academic and clinical demands are the most significant stressors. Moderate stress levels were reported for difficulty of classwork, clinical procedures, and learning precision manual skills, with means around 2.8 to 2.9. In contrast, the lowest levels of stress were linked to personal and social factors, including alcohol and drug use (mean = 1.4 each), roommate relationships (mean = 1.7), and childcare or marriage relationships (mean = 1.6 each).

Stress Coping Strategies and Techniques

Figure 1 summarizes the different strategies dental students use to cope with stress, along with the percentage of respondents reporting each method. The most common strategy was socializing with friends or family (73.9%), followed by engaging in hobbies (66.1%) and exercise or physical activity (63.8%). A smaller portion of students coped by avoiding the stressor (46.8%), practicing meditation or mindfulness (31.7%), or seeking support from mentors or counselors (26.1%). On average, students employed 3.2 different coping strategies for stress management (SD = 1.5).

Figure 2 illustrates the distribution of stress management techniques that students reported as particularly effective during high-pressure situations, such as exams or clinical practice. The most commonly reported strategy was time management and planning ahead, used by 69.7% of students. This was followed by talking to friends or peers, used by 66.1% of respondents. Taking short breaks was another popular technique, selected by 58.7% of students. Less commonly used strategies included positive self-talk at 36.2% and deep breathing or relaxation techniques, reported by 32.1%. A small portion of students (2.8%) indicated using other methods not listed among the main categories. On average, students found 2.7 techniques effective for managing high-stress situations (SD = 1.3).

Students provided feedback on the effectiveness of the school's resources in managing stress. The largest group, 41.1%, chose Neutral indicating that many dental students neither agreed nor disagreed with resource effectiveness. Approximately 32.2% responded positively (Agreed or Strongly Agreed), while 26.6% expressed dissatisfaction by selecting Disagreed or Strongly Disagreed.

A total of 140 responses (response rate: 64.2%) were received for the final open-ended question regarding resources that could better support stress management at the school. The variety of responses by subthemes is summarized in Table 2. The most frequently mentioned need was "free food and snacks" with 29 students expressing interest in healthier and more readily available food options such as snacks in lounges, nutritious meals, and treats like ice cream. "Mental health support" was another major subtheme, reported by 20 students. They advocated for

Table 1. Descriptive statistics of DES questionnaire responses by item.

Question Item	1	2	3	4	5	Mean	SD
1. Stress due to amount of classwork	19/218	42/218	97/218	34/218	26/218	3	1.1
2. Stress due to difficulty of classwork	19/218	62/218	81/218	34/218	22/218	2.9	1.1
3. Stress due to examinations and grades	17/218	25/218	62/218	69/218	45/218	3.5	1.2
4. Stress due to peer competition	57/218	60/218	42/218	39/218	20/218	2.6	1.3
5. Stress due to patient care responsibilities	31/218	37/218	69/218	51/218	30/218	3.1	1.2
6. Stress due to difficulty in learning clinical procedures	29/216	51/216	72/216	39/216	25/216	2.9	1.2
7. Stress due to patients' attitudes toward me	75/218	50/218	47/218	32/218	14/218	2.4	1.3
8. Stress due to patients' attitudes toward dentistry	79/218	56/218	46/218	25/218	12/218	2.2	1.2
9. Stress due to atmosphere created my clinical professors	40/217	58/217	63/217	33/217	23/217	2.7	1.2
10. Stress due to difficulty in learning precision manual skills required in preclinical and laboratory practice	39/217	52/217	67/217	34/217	25/217	2.8	1.2
11. Stress due to reliability of professional dental laboratories in prompt return of cases	50/218	51/218	62/218	35/218	20/218	2.7	1.3
12. Stress due to administrative responses to student needs	57/218	52/218	55/218	36/218	18/218	2.6	1.3
13. Stress due to roommate relationships	141/218	27/218	25/218	16/218	9/218	1.7	1.2
14. Stress due to dating relationships	127/218	35/218	21/218	22/218	13/218	1.9	1.3
15. Stress due to alcohol usage	184/215	4/215	9/215	8/215	10/215	1.4	1.1
16. Stress due to drug usage	185/216	4/216	9/216	10/216	8/216	1.4	1
17. Stress due to reconsideration of dentistry as proper career choice	123/218	40/218	34/218	10/218	11/218	1.8	1.2
18. Stress due to fear of flunking out of school	131/217	32/217	24/217	16/217	14/217	1.8	1.3
19. Stress due to marriage relationship	160/217	16/217	14/217	12/217	15/217	1.6	1.2
20. Stress due to childcare	170/217	12/217	10/217	10/217	15/217	1.6	1.2
21. Stress due to financial responsibilities	66/217	49/217	45/217	30/217	27/217	2.6	1.4
22. Stress due to personal physical health	59/217	81/217	40/217	23/217	14/217	2.3	1.2
23. Stress due to physical health of other family members	83/218	48/218	42/218	29/218	16/218	2.3	1.3
24. Stress due to parent-student relationship	129/218	42/218	16/218	21/218	10/218	1.8	1.2

1: Not Stressful; 2: Slightly Stressful; 3: Moderately Stressful; 4: Severely Stressful; 5: Highly Stressful – For each scale point, relative frequencies of the total sample size of 218 are listed.

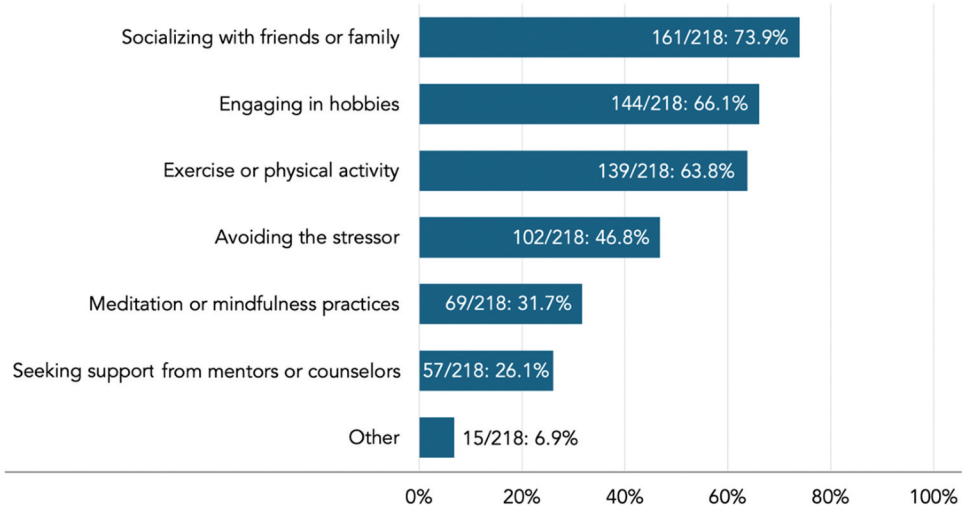

Figure 1. Summary of stress-coping strategies used among dental students (frequency & percentage).

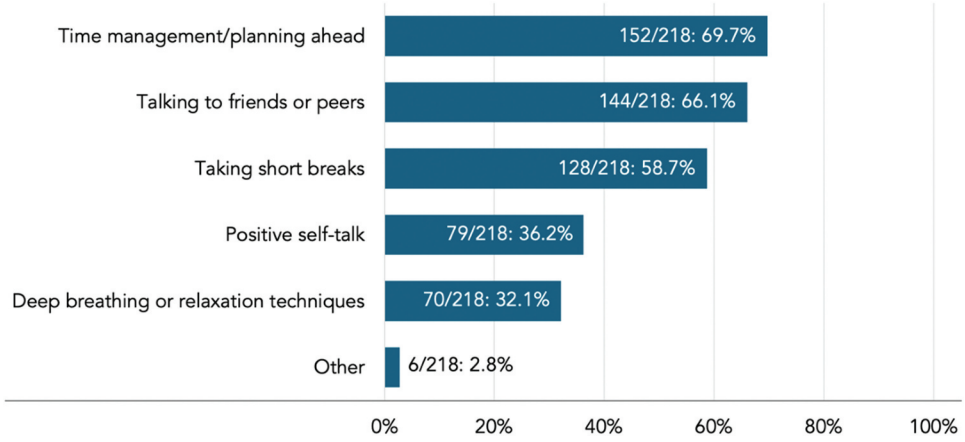

Figure 2. Summary of effective stress management techniques among dental students during high-pressure situations (frequency & percentage).

increased access to counseling services, more mental health professionals, mindfulness and meditation spaces, stress management workshops, and peer-support groups. "Schedule adjustments and time off" were also commonly requested (19 mentions). Students recommended shorter lectures, more breaks, better exam spacing, reduced deadlines, and time off before finals to alleviate academic pressure. Fifteen students emphasized the importance of "social support and events," requesting more opportunities for fun, social interaction, and community-building activities, including those involving other schools. Academic-related concerns were noted by 12 students who called for "curriculum changes" such as reduced coursework, a shift to pass/fail grading, more academic support, and better curriculum structure with student input. "Communication and administrative improvements" were identified by 10 students, focusing on the need for clearer communication, more supportive faculty, and reduced bureaucracy. In terms of "financial support," nine students proposed options like scholarships, tuition relief, and stipends. An equal number mentioned enhancing "facilities and environment," with ideas including massage chairs, improved lounge spaces, and upgraded equipment. "Animal therapy" was suggested by eight students who felt that therapy dogs or allowing pets could help with stress. Two students brought up "spiritual and religious accommodations," asking for greater inclusivity and flexibility for religious practices.

Correlation Analysis

The number of coping strategies correlated significantly with higher stress scores (Pearson's $r = 0.562$, $p < 0.001$). Additionally, perception of available institutional resources was negatively correlated with DES scores (Pearson's $r = -0.272$, $p < 0.001$).

Discussion

Understanding stress among dental students is essential due to the intense demands of dental education and its lasting impact on mental health and professional well-being. The Dental Environment Stress (DES) questionnaire, first developed in 1980, has since undergone various revisions in item content and scoring systems. These changes make it difficult to compare total DES scores across studies, so evaluating the mean score for each item offers a more accurate understanding of

Table 2. Student suggestions for stress management support.

Subthemes	Frequency	Example Responses
Free Food & Snacks	29	Free food, snacks, or drinks
		Better food (including meat)
		Free ice cream
		Snack area in lounge
		More nutritious food options
Mental Health Support	20	More mental health counselors
		Stress management lectures
		Mindfulness, meditation rooms
		Better therapy department
		Peer counseling/support groups
		Mental health week
		Access to counseling services more easily
Schedule Adjustments & Time Off	19	Shorter lectures/longer breaks between classes
		Time to review material before exams
		Spacing out assignments or exams
		Fewer or more flexible deadlines
		Time off before finals
		Fewer unnecessary classes
Social Support & Events	15	More social events (including with other schools)
		Fun activities
		After-school events
		Time for students to socialize
Academic & Curriculum Changes	12	Reduce coursework and assignments
		Revise grading to pass/fail
		More tutoring/academic help
		Better curriculum structure/organization
		Let students give input into curriculum
Communication & Administration	10	Clearer communication from faculty
		Faculty alignment and kindness
		Less bureaucracy
		Better scheduling, streamlined processes
		Addressing student concerns seriously
Financial Support	9	Scholarships, tuition reduction
		Free or affordable tuition
		Financial incentives
		Stipends or grants
Facilities & Environment	9	Relaxing areas/break rooms
		Massage chairs
		More space in clinic or lounge
		Better lab equipment
Animal Therapy	8	Therapy dogs/sessions
		Bring pets for stress relief
Spiritual & Religious Needs	2	Ability to attend Friday prayers
		More inclusive of religious accommodations
Others	7	Everything is perfect
		No suggestions

specific stressors.[6] The findings from this study highlight that academic pressures – such as examinations, grades, and clinical responsibilities – are the primary sources of stress among dental students. These results are consistent with existing literature, which have long identified academic and clinical demands as persistent challenges in dental education.[6,7,10] Interestingly, these stress patterns seem to continue beyond graduation. According to the American Dental Association's Dentist Well-Being Survey, many dentists experience moderate to high levels of workplace stress, with women reporting severe work-related stress at nearly twice the rate of men. Similarly, a majority of dentists (63%) report low levels of stress at home,[14] which aligns with our findings among students, who also report lower stress from social and personal factors.

Our findings supported the original hypotheses. While female students reported slightly higher stress levels than males, the difference was not statistically significant. More importantly, students who used a greater number of coping strategies reported higher stress levels, reflecting efforts to reduce stress and underscoring the value of flexible and adaptive stress management approaches. The most commonly reported coping methods were informal and self-initiated, such as socializing with friends and family, engaging in hobbies, and participating in physical activity. In contrast, formal institutional resources – such as counseling or mentorship support – were used by a much smaller proportion of students. This highlights a potential gap in the utilization of available support systems and may suggest limited awareness and access, or a preference for managing stress through personal networks and self-directed strategies. Students who viewed institutional support more positively reported lower stress levels, emphasizing the importance of fostering a supportive educational environment. These findings are consistent with previous research that highlights the protective impact of proactive coping strategies and resilience training in buffering against academic burnout and emotional exhaustion.[9–11]

While students in this study predominantly relied on personal coping strategies, such as social support and recreational activities, current accreditation standards provide

a foundation for addressing student well-being. The Commission on Dental Accreditation (CODA) acknowledges the importance of wellness through standards like 2–16 (Behavioral Sciences), which covers psychological principles that can relate to emotional regulation and stress, and 4-7a, which ensures access to personal counseling services.[15] These provisions reflect a commitment to supporting students' emotional and psychological needs. However, as dental education continues to evolve, there is growing recognition of the value of explicitly integrating structured stress management and wellness training into the curriculum. Expanding upon existing standards to include proactive, evidence-based instruction in coping and resilience could further strengthen CODA's mission – helping ensure that graduates are not only academically and clinically prepared but also equipped to maintain long-term well-being in a demanding profession.[16–20]

Our study has several notable strengths. A key strength was the inclusion of a qualitative component that captured students' perspectives on how the institution could better support their stress management. The open-ended responses identified a diverse range of needs, including access to free food and healthy snacks, expanded mental health services, more flexible scheduling, opportunities for social connection, and improvements to the learning environment. These insights provide valuable, actionable feedback that complements the quantitative data and highlights the importance of addressing both academic and non-academic contributors to stress. Nonetheless, the study has certain limitations that should be considered. The findings are based on data from a single institution in the West Coast setting. Factors such as institutional curriculum design, tuition rates, and regional cultural norms may significantly influence student stress levels and coping strategies. For instance, universities with quarter systems, higher tuition burdens, or competitive academic climates may create stressors that differ from those at semester-based or lower-cost institutions. Additionally, cultural attitudes toward mental health and academic success may vary by region, further constraining the generalizability of these findings to institutions outside the West Coast or with different demographic and institutional profiles. Additionally, while the response rate to the open-ended question was strong, response bias is possible, as students experiencing higher levels of stress may have been more inclined to respond to the question. Despite these limitations, the mixed-methods design allowed for a comprehensive understanding of student stress and coping, emphasizing the importance of including student voices in efforts to improve well-being in dental education.

Conclusions

Dental students face significant stress, primarily from academic and clinical demands. Those using a greater number of coping strategies, particularly social support and time management, reported higher stress levels. However, minimal utilization of institutional support suggests a need for more structured mental health resources. Integrating wellness programs into dental curricula could improve student well-being and better prepare future practitioners for the demands of the profession.

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Notes on Contributors

Dima Ibnian, DDS, is a dental student Class of 2026 of Loma Linda University School of Dentistry.

Axel Barba, DDS, is a dental student Class of 2026 of Loma Linda University School of Dentistry.

Sara Mojtahedi, DDS, is a dental student Class of 2026 of Loma Linda University School of Dentistry.

Debra Friesen, MS, RDH, is an assistant professor at Loma Linda University School of Dentistry.

Udochukwu Oyoyo, MPH, is an assistant professor at Loma Linda University School of Dentistry.

So Ran Kwon, DDS, MS, PhD, MS, is a professor and director of the student research program at Loma Linda University School of Dentistry.

ORCID

So Ran Kwon http://orcid.org/0000-0002-7067-0603

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