

# Impact of Dental Institutions' Values on Students' Intent to Practice in Underserved Communities: A Cross-sectional Study

Corinne Atiga<sup>1</sup>, Jingwei Cai<sup>2</sup>, Esther Forde<sup>3</sup>, Eun-Hwi Euni Cho<sup>4</sup>, Udochukwu Oyoyo<sup>5</sup>, So Ran Kwon<sup>6</sup>

## ABSTRACT

**Aim:** To evaluate how an institution's values can impact students' intent to practice in underserved areas.

**Materials and methods:** The values of 71 accredited dental schools in the United States were searched and tabulated. The American Dental Education Association (ADEA) survey results were used to tabulate the desire to serve the underserved population before entering dental school and upon graduation. Additionally, responses on the total amount of educational debt on graduation was compiled for LLUSD and all other dental schools. Fisher's exact test was performed to compare the difference between the two cohorts and Wilcoxon test was used to assess difference within the groups. Tests were conducted at an alpha level of 0.05 with SAS v 9.1.3 (SAS Institute, Cary, NC, USA).

**Results:** The top five values of US dental institutions based on frequency were excellence, diversity/inclusion, integrity, innovation, and respect. There was no statistically significant difference between LLUSD and all other dental schools in their desire to serve the underserved community upon graduation ( $p > 0.05$ , in all instances). Overall, there was a trend that upon graduation, the desire to serve the underserved had less impact on students' decision-making on their career choices. This drop in the desire to serve the underserved was statistically significant within both cohorts in the year 2021 ( $p < 0.001$ ).

**Conclusions:** Dental institutions should focus on better understanding of how their values impact their students' career choices so that they can develop strategies to better align their values with the mission of addressing the dentist shortage in underserved areas.

**Clinical significance:** Dental institutions' values play a major role in impacting students' career choices upon graduation and should be assessed using metrics that are measurable.

**Keywords:** American dental education association senior survey, Career choices, Dental institution, Underserved population, Values.

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## INTRODUCTION

Loma Linda University School of Dentistry (LLUSD) is an institution that emphasizes an education focused on health, science, and spirituality. As such, LLUSD fosters a distinctive learning environment that integrates spiritual elements into its healthcare education, in pursuit of its mission to advance the principles of education and healing. This holistic approach has had a significant impact on the community it serves.<sup>1</sup>

However, despite advances in healthcare and dedicated community service activities, many people in underserved areas still lack access to dental care, which can negatively impact their oral health and well-being. There are approximately 50 million persons living in dental underserved areas which are areas that are more likely to comprise individuals with lower socioeconomic status, higher levels of underrepresented population groups, and have lower population densities than non-underserved areas. It was estimated that additional 7,300 dentists would be needed to meet shortage in those areas.<sup>2</sup> Academic institutions have taken measures to address the perceived shortage of dental professionals in healthcare. One key strategy involves increasing the number of dental students by expanding dental programs, thus producing a larger pool of new dentists. Simultaneously, institutions are emphasizing the importance of community-based dental education to equip students with the skills to address the specific needs of underserved populations and also instill a sense of commitment to public health.<sup>3</sup>

<sup>1,2</sup>Loma Linda University School of Dentistry, Loma Linda, California, United States of America

<sup>3</sup>Admissions and Student Affairs, Loma Linda University School of Dentistry, Loma Linda, California, United States of America

<sup>4</sup>Educational Quality and Outcomes, Loma Linda University School of Dentistry, Loma Linda, California, United States of America

<sup>5</sup>Dental Education Services, Loma Linda University School of Dentistry, Loma Linda, California, United States of America

<sup>6</sup>Division of General Dentistry, Loma Linda University School of Dentistry, Loma Linda, California, United States of America

**Corresponding Author:** So Ran Kwon, Division of General Dentistry, Loma Linda University School of Dentistry, Loma Linda, California, United States of America, Phone: +909 558 5118, e-mail: sorankwon@llu.edu

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The American Dental Education Association (ADEA) includes members from all 78 US and Canadian dental schools, more than

800 allied and advanced dental education programs, and more than 50 corporations.<sup>4</sup> The mission of ADEA is to lead and support the health professions community in preparing future-ready oral health professionals. As such, ADEA plays a vital role in collecting data relevant to dental education. Each year, ADEA distributes a survey to dental school seniors, which is called "the ADEA Senior Survey". The survey addresses the journey of US dental schools' predoctoral seniors, from its influences and motivations to pursue careers in dentistry and the students' perceptions of their dental school experience to their plans upon graduation and the investment in their careers. The results of the survey are published as a summary report of US Dental School Seniors. The summary provides a valuable snapshot of the national average but does not reflect the characteristics that may be attributed to the unique teaching environment and values of an institution.

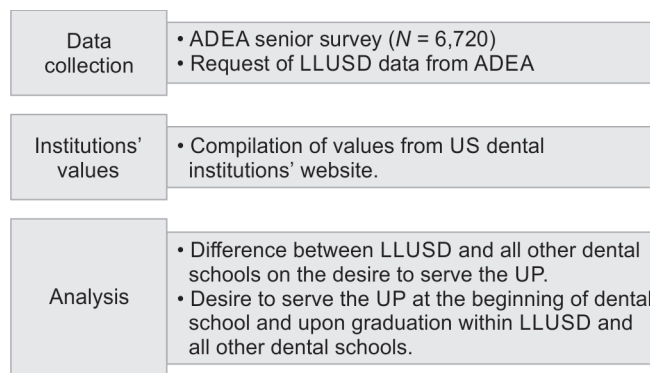
An institution's values play a vital role in shaping its culture and can influence students' decision-making.<sup>5</sup> Currently, there exists a significant gap in knowledge concerning the mechanisms through which the core values emphasized by dental institutions can affect a tangible influence on the career choices of dental students once they graduate. It can be speculated that institutions that prioritize service as a fundamental value, may serve as a catalyst for students' inclination toward pursuing a career in underserved communities. Therefore, the objective of the study was to explore how an institution's values can impact students' intent to practice in underserved areas. Loma Linda University School of Dentistry was compared with all other schools due to its unique values and to implement potential curricular innovations, community outreach programs, and faculty mentorship.

## MATERIALS AND METHODS

In 2021, the American Dental Education Association (ADEA) conducted the annual US Dental School Seniors Survey among 66 US dental schools that had graduating classes. Questionnaire was designed, modified, and validated by ADEA Education Research Committee.<sup>6,7</sup> ADEA initially sent a message via e-mail containing a survey access link to a designated representative at each school. These representatives were responsible for forwarding the initial message via e-mail to the graduating class of their school, followed with subsequent reminders to each senior students. This survey was initially released on March 18, 2021; the data collection window was open until June 18, 2021. Every student in the senior class of each school (total 66 schools) were invited to participate the survey via e-mail. In total, 6,720 students received the survey link national wide. There were 6,588 students from all other schools and 132 students from LLUSD that received the survey invitation.

Upon request, ADEA provided the survey results for the dental seniors of 2021, which is called the "ADEA Senior Survey."<sup>7</sup> Among many questions within the survey, specific questions on the desire to serve the underserved population before entering dental school and upon graduation were compiled for a LLUSD and all other dental schools. Additionally, responses on the total amount of educational debt on graduation was compiled for LLUSD and all other dental schools. The cross-sectional study of reviewing deidentified data was approved by Loma Linda University Institutional Review Board as a non-human subject study (IRB #5220416).

### Flowchart 1: Experimental design of study



UP, underserved population

Fisher's exact test was performed to compare the difference between LLUSD and all other schools on the desire to serve the underserved population and Wilcoxon test was used to assess the difference within the groups. Tests were conducted at an alpha level of 0.05 with SAS v 9.1.3 (SAS Institute, Cary, NC, USA).

## RESULTS

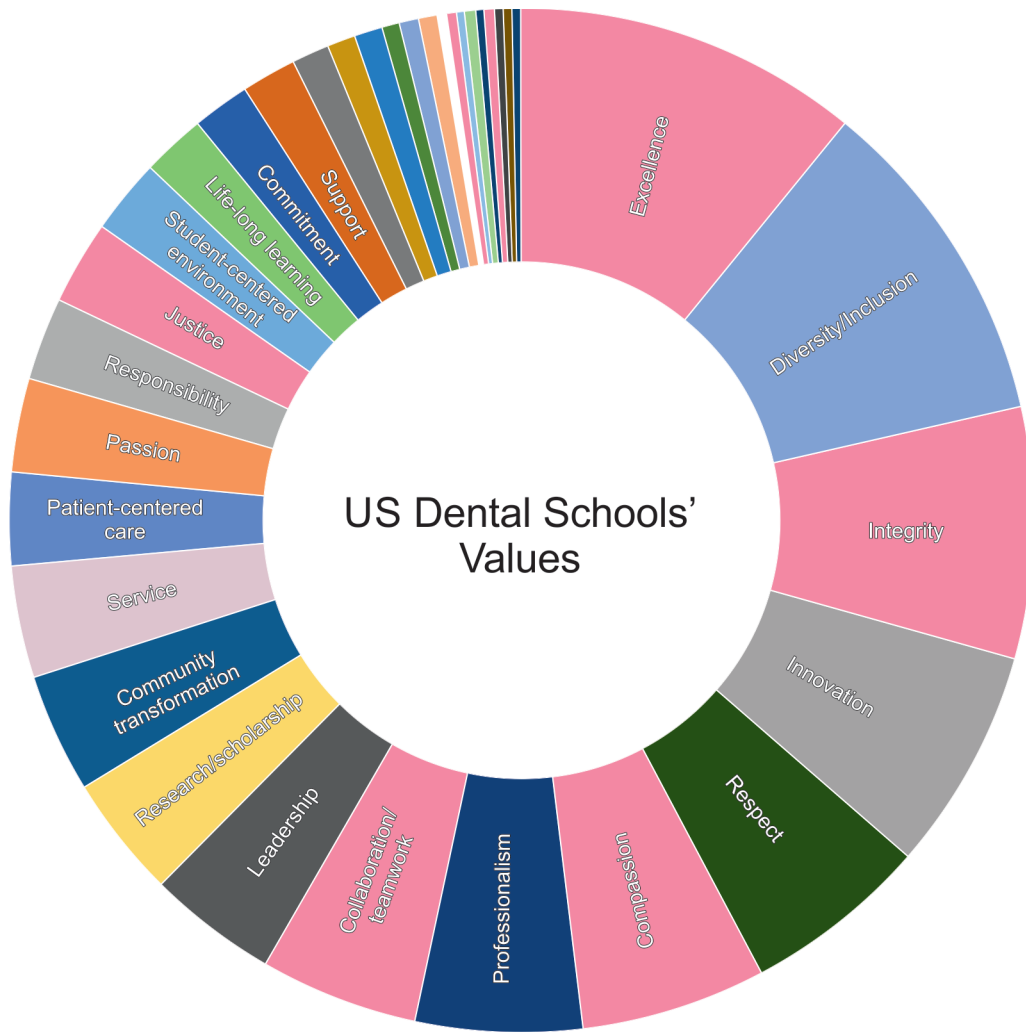
In total, 6,720 students received the survey link among the 66 US dental schools, 2,975 students responded. There were 132 students from LLUSD who received the survey invitation, and 129 students completed the survey, while three students had incomplete responses. The experimental design of the study is illustrated in [Flowchart 1](#). The database search on dental institutions' website yielded a total of 35 values from 62 dental schools. Top five values based on frequency were excellence, diversity/inclusion, integrity, innovation, and respect ([Fig. 1](#)). There were several unique values, such as wellness, humility, and wholeness. Loma Linda University School of Dentistry is founded on seven core values: compassion, excellence, humility, integrity, justice, teamwork, and wholeness.

The results received from ADEA includes qualitative data by institution and individual data with variations are not included. [Figure 2](#) illustrates the trend of students' desire to serve the underserved. On average, 17% of students became dentists because of the opportunity to serve vulnerable and low-income population. There was no statistically significant difference between LLUSD and all other Dental Schools in their desire to serve the underserved community upon graduation ( $p > 0.05$ , in all instances). Overall, there was a trend that upon graduation, the desire to serve the underserved had less impact on students' decision-making on their career choices. This drop in the desire to serve the underserved was statistically significant within both cohorts in the year 2021 ( $p < 0.001$ ).

The financial burden upon graduation is illustrated in [Figure 3](#). Approximately, 15% of LLUSD students, as well as all other dental school students managed to complete their education without incurring any dental school or pre-dental educational debt. The distribution of debt among graduates was as follows:

A relatively low percentage of LLUSD students, around 5.5%, had a debt load of up to \$199,999, while a larger portion, approximately 17.7%, of students from other dental schools fell into this debt range.

Moving up the debt scale of \$400,000–\$549,999, a substantial portion of LLUSD students, at 39.6%, had debts within this range,



**Fig 1:** Distribution of values from 62 dental schools in the United States  
 Top five values based on frequency were excellence ( $N = 37$ ), diversity/inclusion ( $N = 36$ ), integrity ( $N = 27$ ), innovation ( $N = 24$ ), and respect ( $N = 20$ ). Loma Linda University School of Dentistry's values are highlighted in pink and include excellence, integrity, compassion, teamwork, justice, humility, and wholeness

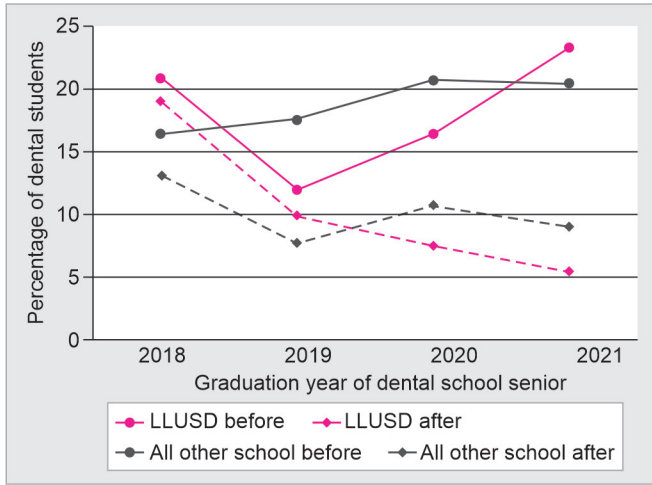
whereas only 18.3% of students from other dental schools carried this level of debt. Lastly, among LLUSD graduates, around 6.2% faced the financial challenge of debts exceeding \$550,000, whereas a correspondingly smaller proportion, approximately 2.7% of students from other dental schools were situated within this upper debt level.

**DISCUSSION**

Dental institutions are vital in graduating competent oral healthcare providers, with their values significantly influencing education and training. Yet, there is no single platform that lists the values of all U.S. dental schools and there has been no study that correlated the institutions' values to dental students' career choices upon graduation. The compilation of US dental institutions' values revealed a strong emphasis on excellence, diversity, integrity, innovation, and respect in providing comprehensive education to students. These values ensure that graduates excel not only as skilled clinicians but also as ethical

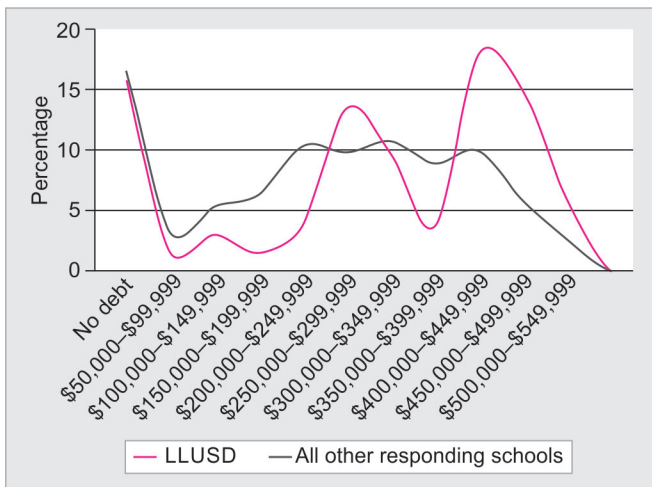
professionals who advance oral healthcare while serving diverse patients with respect.

Our results indicated a notable decline in the proportion of students desiring to serve underserved populations, with roughly one in five initially expressing this intent upon entering dental school, compared with only 1 in 10 maintaining this goal upon graduation in the year 2021. This drop in commitment during their dental education can be attributed to several factors, including financial considerations, work-life balance, challenges in under-served community integration, and shifting personal priorities. Among those factors, student debt has emerged as a key influence on career choices, with studies suggesting that it may lead to a preference for private practice over government service, teaching, research, or public health roles.<sup>8-10</sup> Dental schools can bridge students' needs of paying off loans and the shortage of dental care providers in underserved areas by informing and promoting both federal and state loan repayment programs, which offer financial support to dental health professionals



**Fig. 2:** Desire to serve the underserved population before and upon graduation-by-graduation year

After, factors that led to choose career path after graduation—desire to serve the underserved; Before, reason for becoming a dentist before dental school—opportunity to serve vulnerable and low-income populations; LLUSD, Loma Linda University School of Dentistry



**Fig 3:** Total education debt (Dental School and Predental Educational Debt)

who agree to provide direct patient care in dentally underserved areas, especially for General Dentistry. However, it is important to highlight that while educational debt played a statistically significant role in predicting postgraduation plans, other variables such as gender, race, and parental dental profession had a more substantial impact.<sup>9,10</sup> As such the characteristics of the dental student body may be a better predictor of career choices among dental school seniors than educational debt alone, underscoring the novel need to reassess institutional values and their impact on their graduates' career decisions.

It is noteworthy to point-out the limitations of the study. As a cross-sectional study, the current compilation of data was not able to identify causation or temporal sequences. Additionally, the data were dependent on students' reporting and there were no metrics to follow-up the data.

The ADEA exit survey offers valuable insights into dental school seniors, yet it lacks the necessary metrics to quantitatively assess the association between student attributes and career choices. LLUSD emphasizes compassion, excellence, humility, integrity, justice, teamwork, and wholeness but the current study identified that there are no metrics that can assess the relationship of LLUSD's core values to graduates career choices. Thus, it is important that in the future dental institutions review their mission statements and values and add metrics to assess outcomes and any correlations. To enhance this evaluation, institutions could introduce additional metrics, such as longitudinal career tracking, student debt-to-income ratios, community service commitment assessment, retention rates of mission-oriented graduates, and alumni feedback on the influence of institutional values on career decisions.

**CONCLUSIONS**

The study revealed a notable decrease in the number of students committed to work in underserved communities. Initially, about one in five students expressed this intention upon entering dental school, but by the time of graduation in 2021, only 1 in 10 remained committed to this intention. Within the limitations of the study, we conclude that institutions should prioritize understanding how their values impact their students' career choices so that they can develop strategies to better align their values with the mission of addressing the dentist shortage in underserved areas.

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