

## Scientific Research Report

## Exploring Humanities Education in Chinese Dental Schools: Perspectives From Faculty Members and Students

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## ABSTRACT

**Objective:** To evaluate the status quo of humanities education in Chinese dental institutions and identify improvement areas.

**Methods:** A nationwide cross-sectional study across 20 representative Chinese dental institutions employed survey questionnaires developed through literature review and expert consultations. The questionnaire included a visual analogue scale satisfaction assessment, multiple-choice questions, and open-ended questions supplemented by the Chinese Jefferson Scale of Empathy for students. Responses from students, faculty members, and administrators of each school were analysed to evaluate current practices and improvement opportunities.

**Results:** A total of 5085 dental students, 2044 faculty members, and 20 administrative staff from 20 dental institutions completed the questionnaires. Both cohorts identified the curriculum design and teaching delivery mode as the most unsatisfactory aspects of current humanities education. Specifically, students emphasized the need for longitudinal integration of humanities content throughout dental education. Satisfaction levels varied significantly by students 'academic progression and faculty members' career stage. Female dental students consistently demonstrated higher empathy scores than males ( $P < .0001$ ), with no rural-urban disparities observed. Strong study motivation was positively correlated with higher empathy scores ( $P < .0001$ ), while study stress also showed a positive correlation with empathy scores.

**Conclusions:** Humanities education in dentistry was found to have positive effects on dental students. However, current humanities education requires curricular optimization, pedagogical innovation, and empathy cultivation strategies to enhance implementation efficacy.

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## Introduction

Healthcare humanities is a comprehensive term that encompasses both the arts and humanities, focusing on three main areas. Firstly, it involves humanities disciplines that study medicine. Secondly, it employs the arts as a therapeutic tool in healthcare. Thirdly, it integrates the arts and humanities

into medical education. Health humanities usually includes disciplines such as philosophy, ethics, history of medicine, literature, performing arts, and cultural anthropology.<sup>1</sup> The objectives of teaching humanities in a dental curriculum are that humanities provide insights into human conditions, illness and suffering, and perception of oneself, as well as into professionalism and responsibilities to self and others, colleagues, and patients.<sup>2</sup>

The integration of humanities education in healthcare programs is crucial for the advancement of healthcare systems and social welfare.<sup>3,4</sup> The comprehensive development of dental students, including their capabilities to learn,

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critically think, care, and dedicate themselves, is extremely important for the future of oral healthcare practice.<sup>5</sup> Dental clinician-scientists who possess training in patient care and backgrounds in healthcare humanities are crucial for clinical research. The combination is essential for integrating theory and practice effectively in humanities education.<sup>6,7</sup> Focus on dental humanities education would fill a critical gap, as existing research predominantly addresses medical humanities while overlooking discipline-specific adaptations for dental training – despite dentistry's unique position as both a subset of and distinct entity within broader medical practice.<sup>1,8</sup>

Despite the reintroduction of humanities education into China's dental curriculum since the 1980s, the educational outcomes have been variable among faculty members and students. These concerns stem from deficiencies in integrating healthcare humanities into clinical training and inconsistencies in curriculum standards across different dental institutions.<sup>9</sup> Additionally, there is a need for further evaluation of the effectiveness of the curriculum in addressing the increasing workload and psychological pressure experienced by clinicians in their workplaces.<sup>10,11</sup>

In light of these concerns, this study aimed to evaluate the current status of humanities education in Chinese dental institutions through a survey of students, faculty members, and administrative staff. The study also aimed to identify potential and future strategies for improving humanities education to equip the oral healthcare workforce with the necessary competencies and ethical values for future delivery of patient care.

## Materials and methods

### Participants enrolment for questionnaire survey

Twenty dental schools were selected by stratified random sampling from 65 dental schools across seven regions in China, including the Northern, Eastern, Central, Southern, Northeastern, Northwestern Area, and Southwestern Areas of Mainland China. To ensure demographic and educational representativeness, a stratified proportional sampling approach was implemented by geographic region, which inherently aligned the sample composition with the national distribution of dental students. While individual institutions might exhibit minor variations in participant demographics, our regional proportionality ensured that the aggregate sample accurately reflected the overall population in terms of geographic distribution and institutional characteristics. Each of the seven regions in the country has 30% of the dental schools enrolled. The final respondent pool maintained proportional representation across all regions relative to the total target population. The inclusion criteria for student participants were: (1) current enrolment at a dental school and (2) aged over 16, while exclusion criteria being: (1) refusal to participate and (2) non-Chinese nationality. The participated faculty members were required to meet the inclusion criteria of being: (1) employed by the dental school and aged over 30 years. (In China, the average minimum age for assuming a teaching role in dental school is around 30 years old. This

requirement is in place due to the fact that most faculty members hold doctoral/PhD or equivalent degrees.) While exclusion criteria included: (1) refusal to participate in the study, and (2) non-Chinese nationality. (This study examines the homogenized cohorts of domestic dental students across various institutions within China's educational and sociocultural context.) One representative administrative staff, responsible for educational affairs, from each included dental institutions was included to complete the inquiry questionnaires regarding the respective healthcare humanities curriculum.

### Questionnaire design

A multiperspective approach was employed, and tailored questionnaires were developed for three distinct groups: students, faculty members, and administrative staff of dental schools. Initially, a pilot test of the questionnaires involving 50 students and 30 faculty members was performed to gain feedback from a diverse panel of experts, including board members of the Educational Committee of the Chinese Dental Association, school deans, and renowned domestic and international educators in the field. Prior to the distribution of the pilot questionnaires, the content validity was confirmed through interviews with dental students, faculty members, and staff, along with multiple consultations with experts in dental education and medical humanities education. Upon receiving the reply and feedback of pilot questionnaires, additional questions were included, and the questionnaires were refined during the National Expert Consensus Seminar on Medical Humanities Education in Dental School in 2020. This holistic approach enabled the collection of data from diverse perspectives, including students, teachers and educators, and administrators responsible for overseeing the implementation of humanities education in dental institutions.<sup>12</sup>

#### 1. Student and faculty members

Two separate questionnaires were developed for dental students and faculty members. The student questionnaire covered various aspects: one is demographic factors including the student's school, age, gender, educational stage, rural or nonrural background, study motivations, and stress levels; the others are humanities education satisfaction survey and empathy survey. The faculty members questionnaire addressed topics such as age, gender, academic rank, and humanities education satisfaction survey.

To assess the satisfaction level of both students and faculty members, we included a visual analogue scale (VAS) in the questionnaires. In the VAS assessment, participants marked a point on a horizontal line that represents the level of satisfaction perception for each of the items questioned. The VAS score was determined on a scale from 0 to 10, with 10 being the highest level of satisfaction. In this study, VAS satisfaction assessment was conducted on four aspects around dental humanities education, including (1) Overall satisfaction in the outcome of humanities education in dentistry, (2) overall satisfaction in humanities curriculum in dentistry, (3) overall satisfaction in healthcare humanities environment (eg, clinic setup, decoration, and infrastructure); and (4) overall satisfaction in dental treatment protocols (eg,

protocols that may influence patient's experience regarding empathy and care). In addition, open-ended questions were included to gain a more comprehensive understanding of the mode of teaching delivery employed by each school, along with suggestions on future changes to humanities education from both students' and faculty members' perspectives.

Finally, to evaluate students' empathy skills, the 20-item Chinese version of the Jefferson Scale of Empathy<sup>13</sup> was utilized. This quantitative assessment allowed us to gain a better understanding of their empathy skills under the current teaching. The questionnaire was answered using a 7-point Likert scale, where 1 represented 'Strongly Disagree' and 7 represented 'Strongly Agree'. The assessment consisted of three dimensions of empathy: 'Perspective Taking' (10 items), 'Compassionate Care' (8 items), and 'Walking in the Patient's Shoes' (2 items).

2. Administrative staff responsible for educational affairs at dental schools

To understand the level of implementation of healthcare humanities in dental schools, we sent an inquiry questionnaire to the administrative staff responsible for educational affairs at each school. The questionnaire covered various aspects, such as the allocation of course credit for healthcare humanities education, the humanity courses setting across different educational stages, the pedagogies employed for delivering humanities content.

#### Sample size calculation

For students, the sample size was calculated using the following formula. The calculation yielded a theoretical minimum sample size of 1708. In our actual study implementation, we maximized dental students' participant enrolment by including as many eligible respondents as possible in the questionnaire survey.

$$n = \frac{z_{\alpha/2}^2 \times \sigma^2}{E^2}$$

For faculty members, the sample size was calculated using the following formula. The calculation yielded a theoretical minimum sample size of 1594.1. In our actual study implementation, we maximized dental faculty members participant enrolment by including as many eligible respondents as possible in the questionnaire survey.

$$n = \frac{z^2 \times \sigma^2}{E^2}$$

#### Questionnaire distribution

The anonymous questionnaire was distributed to dental students and faculty members from the enrolled schools using the WJX (wjx.cn) online questionnaire service from September 2020 to August 2021. The education office of each dental school received an email invitation containing a link to the questionnaire website, which was then distributed to all currently enrolled dental students and faculty members. Dental students comprised undergraduate, postgraduate, and dental resident at the affiliated hospitals of the dental schools. The

faculty members encompassed a range of academic ranks from instructors, assistant professors, associate professors to professors. A reminder message was sent before the survey completion deadline. No identifying information was recorded, and participation was voluntary.

#### Statistical analysis

The validity and reliabilities of the VAS assessment section and the empathy assessment section of the questionnaire were tested using Cronbach's alpha value and the Kaiser–Meyer–Olkin (KMO) measure. Cronbach's alpha was utilized to assess the internal consistency of the scales, while the KMO coefficient was used to determine the adequacy of the sample for conducting factor analysis.

For the statistical analysis of the outcome of questionnaires, the normality of data was initially analysed. To determine statistical significance, independent two-sample t test and One Way ANOVA were used, with the significance level at 95% confidence. Data analysis and figure construction were performed using GraphPad Prism 8.0 software (GraphPad Software, Inc) and SPSS 20 software (IBM SPSS Statistics, Inc).

#### Review of information regarding examination guideline of National Dental Practitioner Examination and medical humanities course in Chinese dental intuitions

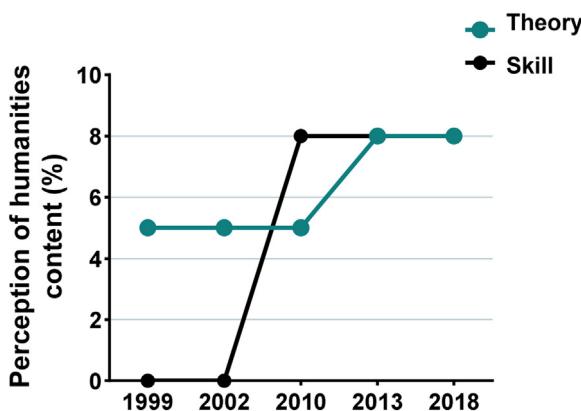
The Examination Guideline of the National Dental Practitioner Examination (NDPE) in China spanning from 1999 to 2018 were meticulously reviewed. A detailed textual analysis was carried out to determine the percentage of exam questions related to humanities content, and an in-depth analysis of the question content was performed. Besides, a comprehensive textual analysis of the Inquiry Questionnaires completed by the 20 representative administrative staff from each dental school was conducted regarding humanities curriculum outline, content, and teaching plan.

#### Results

In this study, a total of 7000 student questionnaires were distributed, with 5259 returned (response rate: 75.1%), of which 5085 were valid (valid response rate: 72.6%). Additionally, 2600 faculty members questionnaires were distributed, with 2112 returned (response rate: 81.2%), of which 2044 were valid (valid response rate: 78.6%).

#### Validity and reliability of the questionnaires

For the VAS assessment, the Cronbach's alpha value of student's version was 0.934, and KMO was 0.771. The Cronbach's alpha value of faculty members' version of VAS assessment was 0.936, and KMO was 0.789. For the empathy assessment, the Cronbach's alpha value was 0.873, and KMO was 0.925. These indicated that the questionnaires used showed good reliability and validity.



**Fig. 1 – Perception of humanities content from Guideline of National Dental Practitioner Examination. The line chart illustrates the proportion of theory and skill examinations related to humanities content in the guidelines from 1999, 2002, 2010, 2013, and 2018.**

#### Findings from guideline of NDPE and the humanities curriculum in Chinese dental intuitions

Since the implementation of NDPE in China in 1999, the examination guidelines have undergone four revisions up to 2018. An analysis of the five versions of the examination guidelines reveals that three theoretical courses – Medical Ethics, Healthcare Law and Policy, and Psychology – have been consistently included in the NDPE since its inception in 1999. Additionally, a practical assessment component, Medical Humanistic Quality, was introduced in 2010 (Figure 1).

Overall, the proportion of examination content dedicated to assessing candidates' theoretical knowledge and practical skills in healthcare humanities has shown an upward trend. In 1999, the three theoretical courses accounted for 5% of the examination content, which increased to 8% starting in 2013. The practical assessment of healthcare humanistic skills, which initially accounted for 0% of the examination, rose to

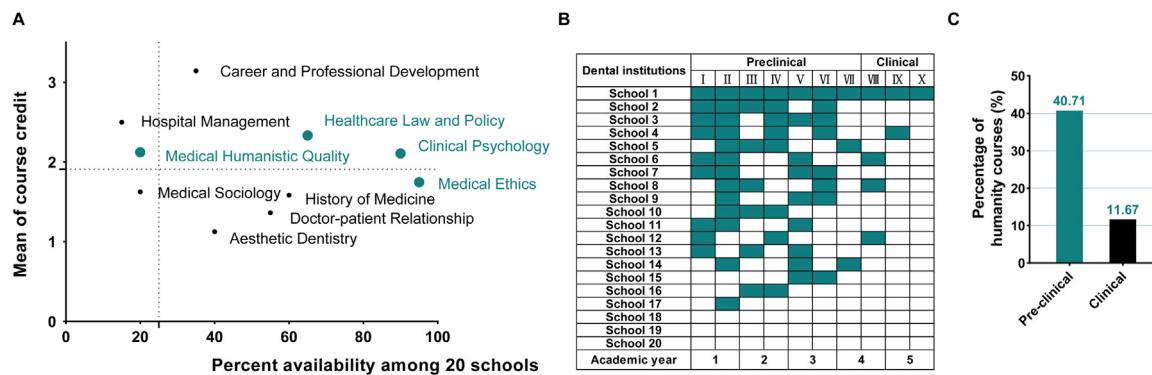
8% in 2010. Notably, the theoretical assessment of Healthcare Law and Policy, as well as the evaluation of students' performance in healthcare humanities, have seen significant increases in their respective weightings over time.

#### Overview of current humanities course in dental institutions

An overview of the current humanities course in dental institutions was derived from the questionnaires submitted by administrative staffs overseeing educational affairs at various dental schools. The results shown in Figure 2A indicate that 15% of the institutions surveyed did not offer all three courses mentioned above required for the NDPE. The distribution of healthcare humanities courses among the 20 dental schools varied significantly between the preclinical and clinical periods, with a higher proportion (40.71%) of content being offered in the preclinical period compared to the clinical period (11.67%), as shown in Figure 2B and C. To enhance students' humanistic professionalism, Table 1 provides an overview of current humanities courses offered to undergraduates and residents that have been recently introduced.

#### Satisfaction with humanities education in dental institutions among students and faculty members

A total of 5085 dental students (32.9% male and 67.1% female) and 2044 faculty members (36.7% male and 63.3% female) responded to the questionnaire. The effective response rates of student and faculty members were 72.09% and 76.35%, respectively. Among the dental students, there were 2652 undergraduates (52.2%), 1281 master's students (25.2%), 775 residents (15.2%), and 377 PhD students (7.4%), while most students aged 20 to 25 years old (3425, 67.4%). Among the dental faculty members, there were 328 professors (16.1%), 472 associate professors (23.1%), 796 assistant professors (38.9%), and 448 instructors (21.9%), while most faculty members aged younger than 40 years old (1229, 60.1%). The findings indicated a relatively high level of satisfaction, with total



**Fig. 2 – Implementation and distribution of humanities courses in dental institutions. (A) The availability and credit allocation of humanities courses in dental curriculum from 20 enrolled dental institutions. The courses related to dental and licensing examinations are labelled in green, while the other courses are labelled in black. (B) Distribution of humanities courses across the 20 participating dental institutions according to the academic year. Each grid on the horizontal axis represents one semester within an academic year. The primary dental curriculum in China is mostly 5 years. (C) Comparison of humanities courses distribution between preclinical and clinical periods in Chinese dental institutions.**

**Table 1 – Overview of healthcare humanities courses provided for dental undergraduates and residents.**

Medical humanities courses	Undergraduates		Residents	
	School number	Availability (%)	School number	Availability (%)
Medical ethics	19	95	5	25
Clinical psychology	18	90	1	5
Healthcare law and policy	13	65	2	10
History of medicine	12	60	1	5
Doctor-patient relationship	11	55	6	30
Aesthetic dentistry	8	40	0	0
Career and professional development	7	35	1	5
Medical humanistic quality	4	20	3	15
Medical sociology	4	20	0	0
Hospital management	3	15	3	15

satisfaction scores of 36.5/40 for 5085 students and 33.9/40 for 2044 teachers. Notably, both students and faculty members expressed the highest level of satisfaction regarding the impact of humanities education, with scores of 9.2 and 8.6, respectively, as shown in [Table 2](#). Additionally, the assessment identified divergent perceptions between students and faculty members across various backgrounds, such as study motivation, stress, educational stage, and academic ranks. In the VAS assessment among students, we took the influence of factors such as gender, educational stage, origin area, study motivation, and study stress into consideration. It was found that there is a statistically significant difference among various subgroups, except for the origin area. Briefly, males and undergraduate students tend to have higher VAS scores compared to other subgroups. Additionally, those with stronger study motivation and greater study stress tend to achieve higher scores. As for the teachers, females exhibited higher scores than males across all items and total scores. Instructors had the highest scores, and there was a tendency for scores to decrease as the academic rank increased.

#### Prospects for future humanities education in dental institutions

To gain insights into the potential prospects for humanities education in the future, the questionnaire employed multiple-choice questions ([Figure 3](#)). To identify limitations in current curricula, the respondents were asked to identify 'Aspects in a healthcare humanities curriculum that need to be improved'. Interestingly, both students and faculty members highlighted 'Mode of teaching delivery' as the most significant area requiring improvement ([Figure 3A](#)). Furthermore, both students and faculty members recommended 'Throughout entire career' and 'During clinical clerkship' as the optimal time periods for humanities learning ([Figure 3B](#)). 'Experimental learning' was identified as the most effective mode of teaching delivery, followed by 'Social outreach project' and 'Learning through scenario simulation' ([Figure 3C](#)).

The results revealed students' varying requirements at different educational stages. For instance, during the undergraduate study, students expressed an interest in dental aesthetics, while clinical psychology and doctor-patient

communication became more critical as they progressed in their humanistic professionalism ([Figure 3D](#)).

Base on the open-ended survey questions, we generated topics and their corresponding representations mentioned concurrently by students, faculty members, and administrative staff. The resulting frequency of topic clusters is displayed in [Figure 4](#). The consensus among the 3 groups was that humanities education in dental education should be strengthened in the future. Notably, empathy enhancement was suggested by students over 169 times for the topics that were suggested.

#### Chinese version of Jefferson scale of empathy

The overall Chinese version of JSE empathy score of the 5085 participants was 113.3, with Perspective Taking accounting for 59.3, Compassionate Care for 43.2, and Walking in Patient's Shoes for 10.8. A comprehensive summary of the scale showed that the average scores for the 10 items under Perspective Taking ranged from 4.8 to 6.5, while the eight items under Compassionate Care from 4.3 to 6.0. To determine the Walking in Patient's Shoes factor, two reversed questions were used: 'It is difficult for me to view things from my patients' perspectives' and 'Because people are different, it is difficult for me to see things from my patients' perspectives', with their average scores being 5.6 and 5.12, respectively.

Besides, the present study also investigated several factors associated with empathy scores, including gender, rural vs nonrural background, study motivation, and stress from study ([Table 3](#)). The results indicated that females obtained statistically higher empathy scores than males, ( $P < .05$ ). However, no significant difference was observed in empathy scores among students from rural and nonrural areas. The study also found that study motivation was positively associated with empathy scores. Moreover, stress from study was found to have a positive influence on empathy scores.

#### Discussion

This nationwide cross-sectional survey assessed the implementation and efficacy of humanities education in Chinese dental institutions through tripartite perspectives (students, faculty, and administrative officers). This study identified key

**Table 2 – VAS assessment among students and faculty members on their satisfaction of current humanities education in the dental curriculum.**

VAS assessment	Item 1	Item 2	Item 3	Item 4	Total
<b>Student (N = 5085)</b>	<b>9.2 ± 1.1</b>	<b>9.1 ± 1.2</b>	<b>9.1 ± 1.2</b>	<b>9.1 ± 1.2</b>	<b>36.5 ± 4.4</b>
<b>Gender</b>					
Male (N = 1671)	9.2 ± 1.2	9.1 ± 1.3	9.2 ± 1.3	9.1 ± 1.2	36.6 ± 4.5
Female (N = 3414)	9.1 ± 1.1	9.1 ± 1.2	9.1 ± 1.2	9.1 ± 1.2	36.4 ± 4.3
P value <sup>†</sup>	.000*	.000*	.000*	.000*	.109
<b>Educational stage</b>					
Undergraduate (N = 2652)	9.2 ± 1.1	9.2 ± 1.1	9.2 ± 1.1	9.2 ± 1.1	36.9 ± 4.0
Master (N = 1281)	9.1 ± 1.2	9.0 ± 1.2	9.0 ± 1.2	9.0 ± 1.2	36.2 ± 4.5
Resident (N = 775)	9.0 ± 1.3	9.0 ± 1.4	8.9 ± 1.5	8.9 ± 1.4	35.8 ± 5.1
PhD (N = 377)	9.1 ± 1.1	9.0 ± 1.1	9.1 ± 1.2	9.0 ± 1.2	36.2 ± 4.2
P value <sup>‡</sup>	.000*	.000*	.000*	.000*	.000*
<b>Origin area</b>					
Rural (N = 2080)	9.1 ± 1.1	9.1 ± 1.2	9.1 ± 1.2	9.1 ± 1.2	36.5 ± 4.3
Nonrural (N = 3005)	9.2 ± 1.2	9.1 ± 1.2	9.1 ± 1.3	9.1 ± 1.2	36.5 ± 4.4
P value <sup>†</sup>	.710	.843	.832	.993	.834
<b>Study motivation</b>					
Score 1 (N = 55)	8.9 ± 2.0	8.7 ± 2.3	8.7 ± 2.0	8.8 ± 2.0	35.1 ± 8.0
Score 2 (N = 29)	8.6 ± 1.4	8.1 ± 1.7	8.4 ± 1.5	8.4 ± 1.4	33.5 ± 5.5
Score 3 (N = 261)	8.2 ± 1.6	8.3 ± 1.7	8.3 ± 1.7	8.2 ± 1.7	33.0 ± 6.1
Score 4 (N = 2228)	8.9 ± 1.1	8.9 ± 1.1	8.9 ± 1.2	8.9 ± 1.2	35.6 ± 4.2
Score 5 (N = 2512)	9.5 ± 1.0	9.4 ± 1.0	9.4 ± 1.1	9.4 ± 1.1	37.7 ± 3.7
P value <sup>‡</sup>	.000*	.000*	.000*	.000*	.000*
<b>Study stress</b>					
Score 1 (N = 1142)	9.2 ± 1.3	9.1 ± 1.3	9.1 ± 1.4	9.1 ± 1.3	36.5 ± 4.9
Score 2 (N = 2520)	9.1 ± 1.1	9.0 ± 1.2	9.1 ± 1.2	9.0 ± 1.2	36.2 ± 4.2
Score 3 (N = 955)	9.2 ± 1.1	9.1 ± 1.1	9.1 ± 1.2	9.1 ± 1.2	36.5 ± 4.3
Score 4 (N = 354)	9.4 ± 1.0	9.4 ± 1.0	9.4 ± 1.0	9.4 ± 1.0	37.6 ± 3.7
Score 5 (N = 114)	9.6 ± 1.2	9.5 ± 1.4	9.5 ± 1.3	9.5 ± 1.2	38.2 ± 4.8
P value <sup>‡</sup>	.000*	.000*	.000*	.000*	.000*
<b>Faculty (N = 2044)</b>	<b>8.6 ± 1.4</b>	<b>8.5 ± 1.4</b>	<b>8.4 ± 1.6</b>	<b>8.4 ± 1.5</b>	<b>33.9 ± 5.4</b>
<b>Gender</b>					
Male (N = 751)	8.5 ± 1.4	8.4 ± 1.5	8.2 ± 1.8	8.3 ± 1.7	33.5 ± 5.9
Female (N = 1293)	8.7 ± 1.3	8.6 ± 1.4	8.4 ± 1.5	8.5 ± 1.4	34.2 ± 5.1
P value <sup>†</sup>	.001*	.011*	.007*	.010*	.004*
<b>Academic rank</b>					
Instructor (N = 448)	8.9 ± 1.2	8.8 ± 1.3	8.6 ± 1.5	8.6 ± 1.4	34.9 ± 5.0
Assistant professor (N = 796)	8.6 ± 1.4	8.5 ± 1.4	8.3 ± 1.6	8.4 ± 1.5	33.8 ± 5.4
Associate professor (N = 472)	8.5 ± 1.3	8.4 ± 1.4	8.3 ± 1.6	8.4 ± 1.6	33.5 ± 5.5
Professor (N = 328)	8.5 ± 1.4	8.3 ± 1.5	8.3 ± 1.7	8.4 ± 1.6	33.5 ± 5.8
P value <sup>‡</sup>	.000*	.000*	.017*	.033*	.000*
P value <sup>†</sup>	.000*	.000*	.000*	.000*	.000*

VAS satisfaction assessment scores were presented as mean ± standard deviation by SPSS 20 software (IBM SPSS Statistics, Inc).

\* P < .05 was considered as statistically significant. Score 1 = Very low study interest/stress; Score 10 = Very strong study interest/stress.

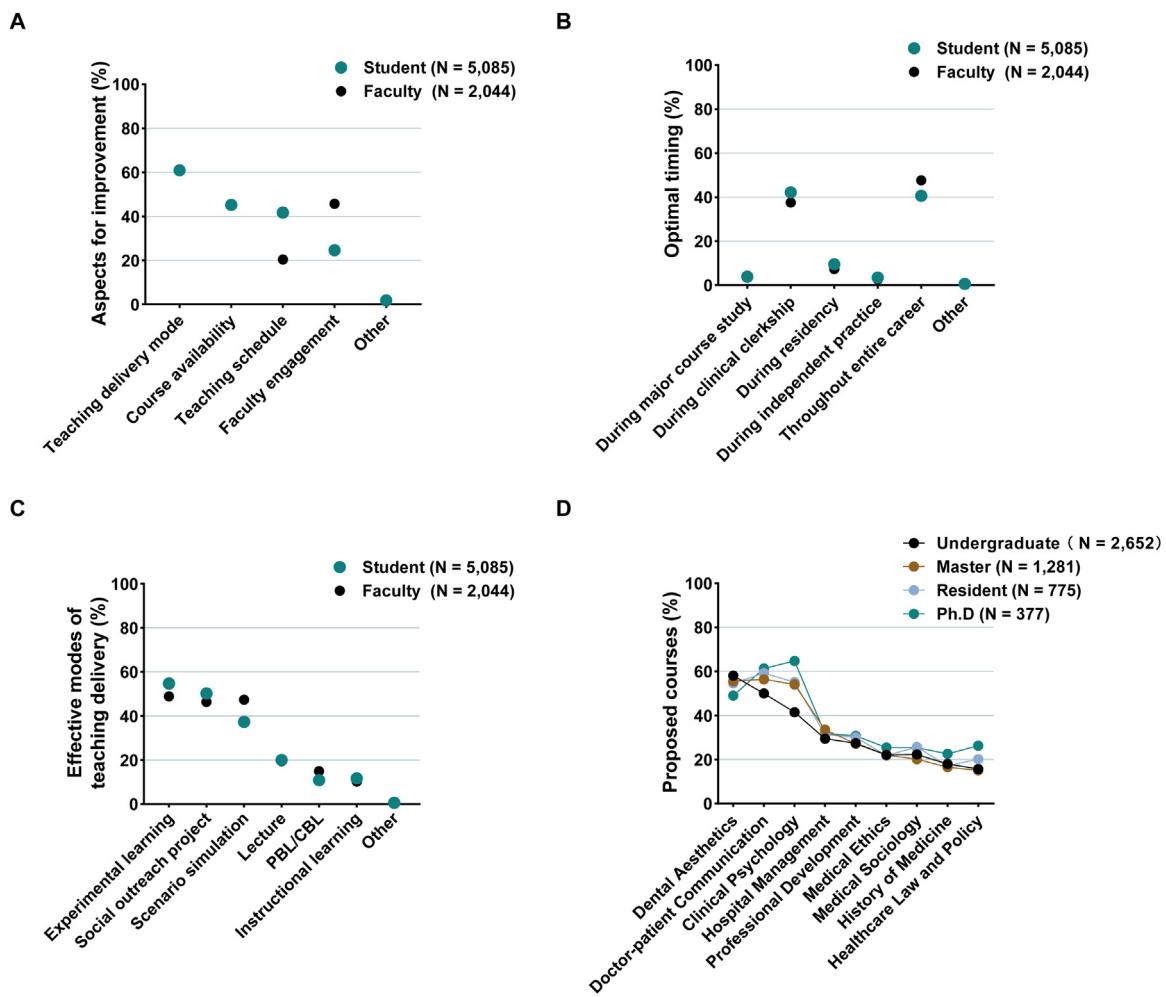
† Independent two-sample t test was used to determine statistical significance between two subgroups of students or faculty members.

‡ One Way ANOVA was used to determine statistical significance among subgroups of students or faculty members. Item 1 = Overall satisfaction in the outcome humanities education in dentistry; Item 2 = Overall satisfaction in healthcare humanities curriculum; Item 3 = Overall satisfaction in the healthcare humanities environment; Item 4 = Overall satisfaction in the dental treatment protocols.

systemic challenges in Chinese humanities education and proposes evidence-based solutions through systematic analysis. Three principal challenges emerged:

Firstly, the primary challenge lies in the misalignment between existing humanities curricula and the evolving demands of dental professional training. According to the national standards for teaching quality in China, all schools are required to adhere to the guidelines of NDPE related to healthcare humanities education. These require students to: master basic knowledge of healthcare humanities, healthcare law and policy, and medical ethics in the field of stomatology; demonstrate fundamental competencies in healthcare humanities, including effective clinical communication,

collaborative skills, empathy, and related abilities; embody the core principles of healthcare humanities, such as commitment to humanistic care and a profound respect for others. However, the study reveals gaps in curriculum implementation 35% of surveyed institutions (7/20) lack Healthcare Law and Policy courses, while Medical Sociology and Hospital Management are offered by only 20% (4/20) and 15% (3/20), respectively. Disparities in course depth and practical application persist across student cohorts. Although both educators and students advocate for longitudinal integration of healthcare humanities throughout the curriculum, current practices in China remain underdeveloped, hindered by limited pedagogical innovation and inconsistent institutional adoption.<sup>14</sup>



**Fig. 3 – Survey outcomes highlighting areas for medication in humanities education in current dental curriculum. (A) Aspects of the humanities education in the dental curriculum requiring improvement. (B) Optimal timing for humanities education within the dental curriculum. (C) Effective modes of teaching delivery. (D) Students' needs for healthcare humanities across different educational stages.**

The integration of dental humanities curricula in global institutions provides instructive models. Harvard School of Dental Medicine has a longitudinal Patient-Doctor course series program spanning all 4 years, combining clinical ethics, communication skills, and cultural competency, and mandatory reflective portfolios in clinical years where students document ethical dilemmas or patient interactions requiring empathy.<sup>15</sup> The King's College London Dental Institute features the Humanities Across the Curriculum Initiative, which emphasizes foundational ethics and the history of dentistry in the early years, while incorporating leadership in healthcare, error disclosure, and addressing mental health stigma during clinical practice in later years. Additionally, the institute facilitates weekly small-group discussions during internships to debrief emotionally charged.<sup>16,17</sup> Similarly, at the National University of Singapore Faculty of Dentistry, students engage in modules on narrative medicine, such as writing patient stories, and explore ethics in teledentistry during clinical rotations.<sup>18</sup>

To strengthen humanities integration in dental education, the following curricular enhancements are proposed:

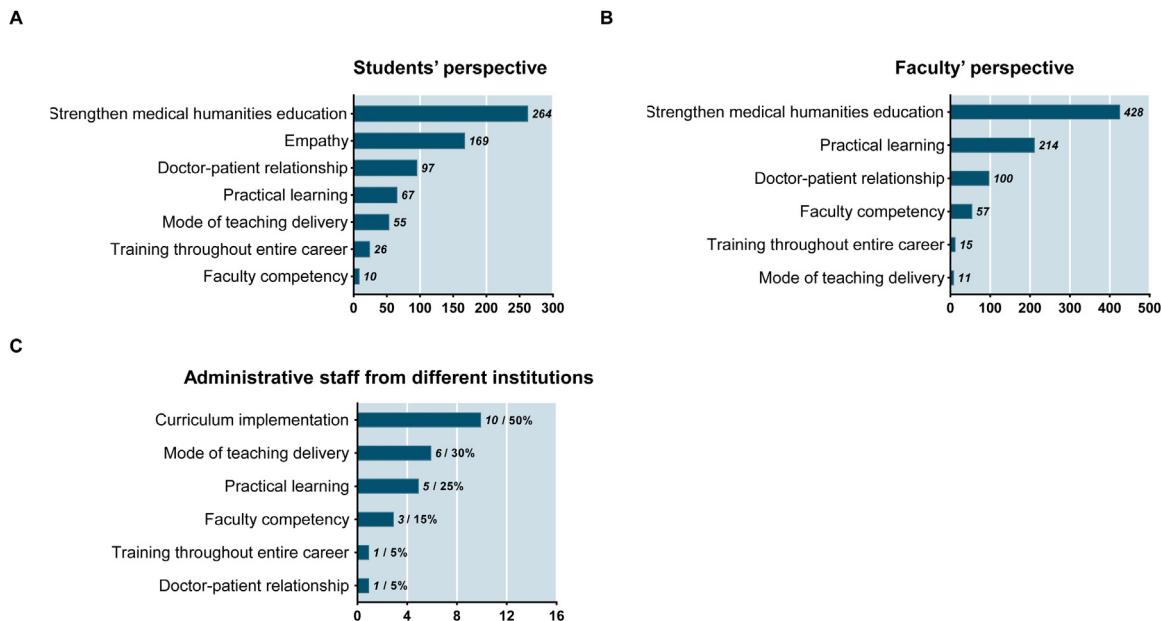
#### 1. Curricular enrichment

Beyond NDPE requirements, systematic incorporation of interdisciplinary modules is recommended: narrative medicine, physician-patient communication, patient-centred case studies, clinical ethics and decision-making, and critical analysis of healthcare systems.

#### 2. Longitudinal curricular integration

Implement a vertically structured curriculum spanning from the early undergraduate years through advanced clinical training. Particular emphasis should be placed on embedding humanities education during clinical clerkship phases, where contextualized learning bridges theory and chair-side practice, reflective portfolios document experiential growth, and ethics rounds complement technical skill development.

The second critical issue is lack of diversity in pedagogical approaches that inadequately fosters students' humanistic literacy. To enhance this, innovative pedagogical approaches should be integrated into teaching practices. Adopt evidence-based instructional methodologies such as Problem-based learning pedagogy; simulation-based communication training; digital storytelling platforms; interprofessional education



**Fig. 4—Key findings from open-ended responses on humanities education in the dental curriculum. (A) Most frequently identified items by dental students. (B) Most frequently identified items by faculty members. (C) Efforts undertaken by dental institutions to address humanities education.**

**Table 3 – Comparison of empathy assessment among subgroups of students.**

Empathy assessment	Perspective taking	Compassionate care	Walking in patient's shoes	Total
Student (N = 5085)	59.3 ± 7.5	43.2 ± 11.5	10.8 ± 3.1	113.3 ± 16.9
Gender				
Male (N = 1671)	60.0 ± 7.5	41.0 ± 12.7	10.4 ± 3.4	111.4 ± 18.3
Female (N = 3414)	59.0 ± 7.5	44.2 ± 10.7	11.0 ± 3.0	114.2 ± 16.1
P value <sup>†</sup>	.000*	.000*	.000*	.000*
Educational stage				
Undergraduate (N = 2652)	59.4 ± 7.6	42.9 ± 11.8	10.6 ± 3.2	112.9 ± 17.1
Master (N = 1281)	59.2 ± 7.3	42.9 ± 11.4	10.8 ± 3.1	113.0 ± 16.6
Resident (N = 775)	59.0 ± 7.6	43.7 ± 11.3	11.1 ± 3.2	113.7 ± 17.3
PhD (N = 377)	59.4 ± 7.7	45.1 ± 9.7	11.4 ± 2.8	115.9 ± 15.8
P value <sup>‡</sup>	.472	.003*	.000*	.010*
Origin area				
Rural (N = 2080)	59.1 ± 7.5	43.0 ± 11.8	10.7 ± 3.2	112.8 ± 17.1
Nonrural (N = 3005)	59.5 ± 7.5	43.3 ± 11.3	10.8 ± 3.1	113.6 ± 16.8
P value <sup>†</sup>	.086	.363	.273	.113
Study motivation				
Score 1 (N = 55)	57.1 ± 14.0	36.9 ± 14.2	9.5 ± 4.0	103.5 ± 19.8
Score 2 (N = 29)	54.7 ± 7.6	38.4 ± 11.7	9.2 ± 3.1	102.3 ± 19.9
Score 3 (N = 261)	54.7 ± 9.0	40.4 ± 11.3	9.8 ± 3.1	104.8 ± 17.3
Score 4 (N = 2228)	57.5 ± 6.8	41.9 ± 11.6	10.4 ± 3.1	109.9 ± 16.4
Score 5 (N = 2512)	61.5 ± 7.0	44.8 ± 11.1	11.3 ± 3.1	117.5 ± 16.0
P value <sup>‡</sup>	.000*	.000*	.000*	.000*
Study stress				
Score 1 (N = 1142)	60.4 ± 7.9	41.6 ± 13.0	10.3 ± 3.5	112.3 ± 18.0
Score 2 (N = 2520)	58.7 ± 7.1	43.4 ± 11.1	10.8 ± 3.0	112.8 ± 16.4
Score 3 (N = 955)	58.9 ± 7.5	43.8 ± 10.7	11.0 ± 2.9	113.7 ± 16.3
Score 4 (N = 354)	60.5 ± 7.4	45.2 ± 10.5	11.6 ± 2.8	117.3 ± 16.5
Score 5 (N = 114)	62.5 ± 10.3	43.8 ± 13.0	11.8 ± 3.4	118.1 ± 19.9
P value <sup>‡</sup>	.000*	.000*	.000*	.000*

Empathy assessment scores were presented as mean ± standard deviation by SPSS 20 software (IBM SPSS Statistics, Inc).

\* P < .05 was considered as statistically significant. Score 1 = Very low study interest/stress; Score 5 = Very strong study interest/stress.

† Independent two-sample t test was used to determine statistical significance between two subgroups of students.

‡ One Way ANOVA was used to determine statistical significance among subgroups of students.

workshops; community-engaged learning projects. These may include senior professors sharing personal experiences through lectures or discussions, artistic performance-based training, problem-based learning and actively listening to the voices of patient undergoing dental treatment.

This approach can enrich the methods of knowledge acquisition, cultivate a humanistic care ethos among dental professionals, and guide dental students in improving their interpersonal relationship skills, thereby allowing the humanistic spirit and empathy to develop intrinsically. To effectively achieve the intended learning outcomes of humanistic education in dentistry, diverse learning experience should extend beyond classroom instruction. Instead, they should incorporate more engaging, student-centred method such as case-based learning, scenario simulation, observation, and direct practice. By adopting blended teaching approaches, students' cognitive and skill development can be enhanced, while also fostering a deeper understanding of humanistic culture, improving their humanistic qualities and caring attitudes. In addition, institutions can explore innovative teaching modes, including online teaching, special lectures, academic activities, role-playing, exhibitions, and evaluation methods, to implement heuristic learning. For instance, Marmara Medical School adopts short tutor presentations, group discussions, and group studies as the primary educational techniques across all courses, guided by the principles of experiential learning. To enrich the social, cultural, ethics, and artistic dimensions of dental practice education, the school utilizes various forms of artistic expression, such as films, visual art, poems, stories, biographies, novels, and essays related to the subjects, as educational materials.<sup>19</sup> This multifaceted approach not only broadens students' perspective but also deepens their engagement with the humanistic aspects of dental practice.

The third challenge involves the imperative to improve dental students' capacity for empathy. Empathy is a critical competency for healthcare professionals, including dental practitioners,<sup>20</sup> and serves as a protective factor against burnout in healthcare professionals.<sup>21</sup> Despite the growing interest in empathy training and the integration of humanities into curricula, the biomedical science-based approaches continue to dominate medical education. Biomedical knowledge and paradigms significantly influence physicians' perception, judgement, and their evaluation of patient issue.<sup>22</sup> The findings of this study suggest that factors such as study motivation, academic stress, and gender can influence the development of empathy among dental students. About relationship between empathy and stress, this may represent a short-term adaptive response where heightened stress temporarily amplifies emotional attunement to others' needs, though chronic exposure could ultimately lead to professional burnout. Clinical evidence supports this dual possibility, as healthcare workers with higher empathy scores frequently report more burnout symptoms, indicating that unregulated empathy may become a stress risk factor. The relationship appears further moderated by gender differences, with women typically showing both higher empathy scores and more stress symptoms, potentially due to biological factors and socialization patterns that encourage emotional attunement. Developmental perspectives suggest the critical importance of regulation

skills – longitudinal data indicates that individuals with high empathy but poor emotion regulation develop more stress-related disorders over time, while those combining empathy with strong regulatory capacities demonstrate resilience.

It is important for empathy training programs to consider these factors when designing interventions aimed at fostering and enhancing empathy skills.<sup>23-25</sup> Research highlights that educators place significant emphasis on cultivating empathic abilities, and students' feedback on humanistic education in dentistry reflects their desire to enhance the benevolence of healthcare providers and adopt a patient-centred approach. The study identified a notable gap in empathy training within dental education and proposed the integration of empathy training into dental curricula as a strategy to enhance the quality of care provided by future dental professionals. Effective methods for enhancing empathy, such as the introduction of narrative medicine, should be further implemented and promoted.<sup>26-28</sup> Role modelling is recognized as one of the most powerful approaches for healthcare professionals, including students, how to interact with patients empathetically. In Asia, there is a growing recognition of the importance of nurturing empathy in medical education, particularly at the undergraduate level. Teaching and learning approaches that engage learners' cognitive processes and incorporate experiential learning, often through role modelling, have proven more effective than traditional didactic methods. It is important to note that one-time or isolated efforts, as well as interventions focused solely on specific approaches, may not yield optimal results in improving empathy.<sup>21</sup> Numerous studies suggest that well-designed educational interventions can effectively cultivate empathy in undergraduate dental students.<sup>29</sup>

Furthermore, the humanities requirement distinctions between dental and medical education should also be noted. Medical and dental humanities differ in the areas: dental humanities address recurring clinic visits where oral health balances biological needs and social symbolism – like designing dentures that meet both functional and aesthetic standards. Medical humanities mostly focus on life-threatening scenarios in hospitals, dealing with mortality and systemic care challenges. Dental studies require specific attention to material ethics (eg, safety vs appearance) and socioeconomic gaps in oral health. Medical humanities frameworks must adapt to dentistry's blend of technical artistry, tradition, and the mouth's dual role as a biological feature and social identity marker.

Cultural and systemic barriers in Chinese dental education manifest through: cultural challenges including insufficient public prioritization of oral health, exam-driven pedagogical frameworks all posing unique demands on integrating humanities into dental training. Historically prioritizing technical skills over empathy training, this approach aligns with broader medical education trends favouring measurable outcomes. Practitioners face extreme workloads (serving 1.4 billion people with limited resources), forcing rushed consultations that strain communication. Cultural norms prioritizing clinical results over dialogue, compounded by hierarchical doctor-patient dynamics, further impede humanistic practice. Yet these pressures heighten the need for humanistic skills: building trust quickly, aligning treatment with patient values, and sustaining clinician

resilience in high-stress environments. This interplay of educational traditions, clinical realities, and cultural expectations creates a distinct context demanding culturally-grounded, efficiency-oriented humanistic training.

In summary, this study aimed to provide valuable insights into the integration and effectiveness of humanities education in Chinese dental institutions and establishes a framework for standardizing dental education programs that prioritize humanistic principles. Ultimately, such efforts have the potential to improve patient care and outcomes in dental practice both in China and globally.

### Strengths and limitations

This study has several strengths, including its large nationwide sample size, multiregional representation across diverse dental institutions in China, and the novel integration of empathy assessment (via the Jefferson Scale) with humanistic education evaluation. On the other hand, there are several potential limitations that need to be acknowledged. The cross-sectional design precludes causal inferences about humanities education's effects. Individual empathy levels may act as a confounding factor affecting the study results. Despite the broad geographic coverage, potential nonresponse bias could affect generalizability, as institutions with stronger humanistic curricula might have been more likely to participate. Additionally, self-reporting biases (eg, social desirability, recall bias) and limitations inherent to online data collection (eg, variability in response environments) could influence results. To mitigate these, we ensured anonymity and used balanced question framing (eg, including negatively worded items in the Jefferson Scale of Empathy to counteract acquiescence bias). Future research utilizing a longitudinal design in multiple countries is necessary to gain a better understanding of the essential factors involved in humanities education and their impact on the education system worldwide in the future.

### Conclusions

This study surveyed 20 Chinese dental institutions, revealing humanities education deficiencies in curriculum design, teaching methodologies, and empathy cultivation. It proposes a multidimensional enhancement framework through curriculum optimization, pedagogical innovation, and targeted interventions.

### Conflict of interest

None disclosed.

### Author contributions

Lili Zhang: Conceptualization, methodology, investigation, data acquisition and analysis, writing – original draft, writing – review and editing. Hui Chen and Michael Francis Burrow: Writing – review and editing. Denian Ba: Conceptualization, methodology, writing – review and editing.

### Ethics statement

This research project received approval from the Institutional Review Board (IRB) of SJUPN-202005.

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