Measurement of Changes in Empathy During Dental School

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Abstract: Empathy in the health care setting is the ability to understand a patient’s experiences and feelings and the capability to communicate this understanding. Although empathy has been shown to play an important role in the dentist-patient relationship and is a core competence for dentists, no measure of empathy has been validated in the dental setting. Further, little is known about changes in empathy during dental school. We examined the psychometric properties of a measure of empathy applied to the dental school setting and compared levels of empathy in dental students across their four years of training. One hundred and thirty students completed a survey including the Jefferson Scale of Physician Empathy (JSPE). The JSPE was found to be both a reliable and valid empathy measure for dental students with similar psychometric properties to those found in medical students, residents, and physicians. Further, first-year dental students had significantly higher empathy scores than students in any subsequent year. Consistent with the literature in medical settings, the timing of the decline in empathy levels corresponded to increases in patient exposure. We suggest that training students in the interpersonal skills designed to enhance the dentist-patient relationship should continue throughout dental school training.

The role of communication and understanding between health care practitioner and patient is receiving increasing attention in general dentistry and in dental specialties. A key component to effective communication and understanding is the ability to demonstrate clinical empathy. In a general context, demonstrations of empathy involve attempts to understand another person’s experiences and feelings and the ability to reflect back this understanding in ways that help others solve their own problems. Empathy in the health care setting can best be viewed as a cognitive and behavioral attribute that involves the ability to understand how a patient’s experiences and feelings influence and are influenced by their symptoms and illness and the capability to communicate this understanding to the patient. It has been referred to as objective compassion and is distinguished from sympathy, a more affective response to a patient’s misfortune that could interfere with objectivity in diagnosis and care.

Empathy has been shown to play several important roles in the physician-patient relationship. For example, physicians high in empathy are more competent in history-taking and physical exams, have higher physician and patient satisfaction, and experience lower malpractice litigation than physicians low in empathy. Additionally, empathy is described as being a significant factor in motivating patients to actively take part in treatment and is a key element in successful treatment outcome.

The role of empathy in the dentist-patient relationship has received less attention. Some evidence suggests that pediatric dentists using an empathetic listening and communication style have greater treatment success. The probability that children exhibit disruptive behaviors during the dental exam is decreased when the dentist uses empathetic reactions, directions, and reinforcement. Demonstrations of caring interpersonal skills and empathy can decrease dental fears and improve treatment outcome in patients with myofascial pain and increase adherence to orthodontic treatment, and increase patient satisfaction with emergency dental care, orthodontic treatment, and extractions, restorations, and endodontic treatments.

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The appreciation of the role of empathy and interpersonal skills in the medical and dental setting has led to curriculum changes in medical and dental training. Presently, the Association of American Medical Colleges (AAMC) has recommended that medical schools educate students to be compassionate and empathetic in caring for patients, demonstrate understanding of the patient’s perspective, understand the meaning of patients’ stories in the context of their families and cultures, and avoid being judgmental even when patient beliefs and values conflict with their own.23 Further, examinees taking the United States Medical Licensing Examination (USMLE) are now tested on verbal and nonverbal communication skills demonstrative of empathy and active listening using standardized patients and behavioral observation.

Similarly, the American Dental Education Association (ADEA) lists providing empathic care for all patients as its second clinical competency for dental training.24 In turn, most dental schools acknowledge the importance of interpersonal skills and include some training in empathy, active listening, and verbal and nonverbal communications, but measurement of the acquisition of these skills remains a challenge. The gold standard for assessment of empathy and interpersonal skills is behavioral observation by trained observers to ascertain use of skills. However, this can be costly and time-consuming. The dearth of research on the topic has been attributed to the absence of adequate self-report measures.25-27 While several self-report measures of empathy have been developed for use in the general population, only one has been developed for use in the health care setting. The Jefferson Scale of Physician Empathy (JSPE)7,27 has been validated in a variety of health care settings, but its psychometric properties have not yet been established in the dental setting. Further, little is known about changes in empathy during formal dental education. This study had two primary aims. First, we examined the psychometric properties of the JSPE27 in order to assess the reliability and validity of the measure as applied to dental students. Second, we examined changes in empathy across dental school training using a cross-sectional survey design.

Methods

The study sample consisted of 130 dental students (eighty-five men, forty-five women) at the University of Washington School of Dentistry. This represents 61 percent of the total student body at the time the survey was administered, a response rate considered “good” for mail survey research.28 A comparison of our sample to that of the student population suggests that our sample had similar demographic features to the population. Of the 130 respondents, forty-three were first-year dental students, twenty-nine were second-year, twenty-seven were third-year, and thirty-one were fourth-year dental students. The mean age of all participants was 26.4 years of age (SD=3.8). Sixty-five percent of our sample was male, a proportion that remains similar throughout each of the classes. Eighty-one percent of our sample reported their race as white, with 18 percent as Asian or other; 1 percent did not respond. Fifty-five percent were never married, 40 percent were married or living as married, and the remainder were divorced. We were unable, however, to collect any information from nonresponders.

All 214 students of the University of Washington School of Dentistry received the survey at the end of their spring quarter with a self-addressed, postage-paid envelope. Electronic mail was used for notification and for two reminders requesting return of the survey. A cover page to the survey explained that completing and returning the survey would be implied consent indicating their willingness to participate in the study and their understanding of their rights as a research participant, including the option to refuse any portion of the study. All procedures were approved by the University of Washington Institutional Review Board. All students were informed of a possible monetary incentive to completing and returning the survey. Of those who completed and returned the survey, four subjects were selected at random and received a $40 gift certificate to the university bookstore.

The Jefferson Scale of Physician Empathy—Health Professionals Version (JSPE-HP)7,27,29 was used to measure empathy in our subjects. There are two versions of the scale to measure empathy in medical students27 and health professionals.29 Among other differences between the measures, wording of items in the HP version reflect actual caregiver behavior rather than attitudes or orientations about practice in general.29 As dental students typically start delivering care in their second year, we chose the HP version. The JSPE was constructed on the basis of an extensive review of the literature, followed by pilot studies with groups of practicing physicians, medical students, and medical residents.27,28 After several iterations and refinements, the JSPE includes
twenty items answered on a 7-point Likert scale (1=strongly disagree through 7=strongly agree). Construct validity of the scale has been confirmed among medical students, medical residents, and physicians using factor analytic methods.25,26,28 Internal consistency (coefficient alpha) of the items was .89, .87, and .81 among medical students, residents, and physicians, respectively. Three- to four-month test-retest reliability was .65 among physicians.29

Based on previous work by Shugars et al.,30 we developed a scale to assess current attitudes toward twenty-six published clinical competencies at the University of Washington School of Dentistry.31 These competencies include technical skills (examining a patient using contemporary diagnostic methods, prescribing and administering pharmacological agents, performing uncomplicated oral surgical procedures) and behavioral and communication skills (applying the principles of behavioral science that pertain to patient-centered care, having the interpersonal and communication skills to function successfully in a multicultural work environment, providing patient education in prevention). Students were asked to rate the importance of training in each clinical competency on a 7-point scale (1=not important through 7=very important). Our purpose in assessing these ratings was to provide an external criterion by which to evaluate the JSPE.

Internal consistency was analyzed using coefficient alpha for internal reliability and a Spearman-Brown for split half reliability. The JSPE consists of ten positively worded and ten negatively worded statements. For the split half coefficient, the scale was split into two halves, each containing five positive and five negatively worded statements. Criterion-related validity was examined by correlating total scores of the JSPE with attitudes toward clinical competencies using Pearson correlations. It was expected that significant correlations would be found for the more behavioral and communication-oriented competencies, demonstrating convergent validity, and that nonsignificant correlations would be found for the more technical competencies, demonstrating discriminant validity of the measure. Construct validity was analyzed by conducting an exploratory factor analysis to investigate the underlying structure of the JSPE. Data were subjected to factor analysis using a principal component factoring method and an orthogonal varimax rotation with Kaiser Normalization.32 Analysis of variance procedures were used to compare group means among demographic variables. A one-way analysis of variance was conducted to evaluate the relationship between empathy and year in dental school, followed by post hoc contrasts using Tukey’s HSD tests. The independent variable, school year, included four levels.

Results

Cronbach’s coefficient alpha for the JSPE was .90, and the split half coefficient was .87, indicating that the JSPE as applied to dental students was internally consistent. To examine criterion-related validity, scores on the JSPE were correlated with ratings for all twenty-six of the attitudes towards clinical competencies. There were significant positive correlations for eighteen of the twenty-six clinical competencies. The strongest correlations were observed for “apply the principles of behavioral science that pertain to patient-centered oral health care”; “evaluate different models of oral health care management and delivery”; “manage medical emergencies in dental practice by providing basic life support”; and “practice dentistry within the ethical standards of the dental profession and the law”—with correlations of .523, .374, .345, and .321 (p’s<.001), respectively. Other significant and positive correlations included attitudes towards competencies such as “recognize the role of lifelong learning and self-assessment in maintaining competency” and “manage a diverse patient population and have the interpersonal and communication skills to function successfully in a multicultural work environment.” Lowest correlations were observed for “diagnose and manage hard and soft tissue lesions and diseases of the orofacial complex”; “prescribe and administer pharmacological agents for patient care”; “manage acute and chronic orofacial and dental pain”; and “utilize business and management skills to conduct an efficient and effective clinical practice”—with correlations of .097, .124, .132, and .135 (p’s>.05), respectively.

To investigate the construct validity of the JSPE as applied to dental students, we conducted a factor analysis using a principal component factoring method with an orthogonal varimax rotation of factors and an eigenvalue cutoff set at 1.32 Similar to previous findings for this measure,27 the resulting principal components analysis yielded a four factor solution explaining a total of 57.8 percent of the item variance. The magnitude of the eigenvalues was 7.52, 1.66, 1.29, and 1.09. These factors explained 22.36
percent, 13.22 percent, 11.89 percent, and 10.35 percent of the item variance, respectively. Factor loadings ≥.40 were applied as the criterion for including an item in a particular factor; the rotated factor matrix is shown in Table 1. This strategy has been used in prior validation research on this measure.27,29 The principal factor corresponds to the belief that taking the patient’s perspective will improve health outcomes. With some item redundancy, factors two and three correspond to understanding the patient’s experiences and feelings, and factor four corresponds to efforts to ignore emotions in patient care.

The mean empathy score for all participants was 117.71 (Table 2). Consistent with other findings,7 the mean empathy score for females was significantly higher than for males (p<.01). There were no significant differences in empathy scores by race, marital status, or age. The ANOVA comparing mean levels of empathy by year in dental school was significant, F=6.57, (p<0.01; df=3). Follow-up contrasts using

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>My understanding of how my patients and their families feel does not influence medical or surgical treatment.</td>
<td>.762</td>
<td>.261</td>
<td>-.035</td>
<td>.366</td>
</tr>
<tr>
<td>I believe that emotion has no place in the treatment of medical illness.</td>
<td>.737</td>
<td>-.008</td>
<td>.071</td>
<td>.235</td>
</tr>
<tr>
<td>My patients value my understanding of their feelings, which is therapeutic in its own right.</td>
<td>.706</td>
<td>.147</td>
<td>.183</td>
<td>.013</td>
</tr>
<tr>
<td>Empathy is a therapeutic skill without which success in treatment is limited.</td>
<td>.670</td>
<td>.168</td>
<td>.291</td>
<td>.012</td>
</tr>
<tr>
<td>I believe that empathy is an important therapeutic factor in medical or surgical treatment.</td>
<td>.659</td>
<td>.305</td>
<td>.287</td>
<td>.030</td>
</tr>
<tr>
<td>My patients feel better when I understand their feelings.</td>
<td>.625</td>
<td>.216</td>
<td>.072</td>
<td>.204</td>
</tr>
<tr>
<td>Patients’ illnesses can be cured only by medical or surgical treatment; therefore, emotional ties to my patients do not have a significant influence on medical or surgical outcomes.</td>
<td>.596</td>
<td>.151</td>
<td>-.116</td>
<td>.509</td>
</tr>
<tr>
<td>An important component of the relationship with my patients is my understanding of their emotional status, as well as that of their families.</td>
<td>.566</td>
<td>.239</td>
<td>.419</td>
<td>-.027</td>
</tr>
<tr>
<td>I do not allow myself to be influenced by strong personal bonds between my patients and their family members.</td>
<td>.463</td>
<td>.117</td>
<td>.343</td>
<td>.103</td>
</tr>
<tr>
<td>Attentiveness to my patients’ personal experiences does not influence treatment outcome.</td>
<td>.431</td>
<td>.474</td>
<td>-.058</td>
<td>.276</td>
</tr>
<tr>
<td>I try to think like my patients in order to render better care.</td>
<td>.407</td>
<td>.519</td>
<td>.423</td>
<td>.115</td>
</tr>
<tr>
<td>I consider understanding my patients’ body language as important as verbal communication in caregiver-patient relationships.</td>
<td>.111</td>
<td>.816</td>
<td>.127</td>
<td>.075</td>
</tr>
<tr>
<td>I try to understand what is going on in my patients’ minds by paying attention to their nonverbal cues and body language.</td>
<td>.119</td>
<td>.758</td>
<td>.364</td>
<td>.096</td>
</tr>
<tr>
<td>I try to imagine myself in my patients’ shoes when providing care to them.</td>
<td>.339</td>
<td>.483</td>
<td>.500</td>
<td>.168</td>
</tr>
<tr>
<td>I try not to pay attention to my patients’ emotions in history taking or in asking about their physical health.</td>
<td>.309</td>
<td>.461</td>
<td>.015</td>
<td>.205</td>
</tr>
<tr>
<td>It is difficult for me to view things from my patients’ perspectives.</td>
<td>.136</td>
<td>.191</td>
<td>.719</td>
<td>.278</td>
</tr>
<tr>
<td>I have a good sense of humor, which I think contributes to a better clinical outcome.</td>
<td>.114</td>
<td>.092</td>
<td>.648</td>
<td>-.019</td>
</tr>
<tr>
<td>Because people are different, it is difficult for me to see things from my patients’ perspectives.</td>
<td>.038</td>
<td>-.004</td>
<td>.461</td>
<td>.642</td>
</tr>
<tr>
<td>Asking patients about what is happening in their personal lives is not helpful in understanding their physical complaints.</td>
<td>.211</td>
<td>.208</td>
<td>.353</td>
<td>.720</td>
</tr>
<tr>
<td>I do not enjoy reading nonmedical literature and the arts.</td>
<td>.139</td>
<td>.155</td>
<td>-.049</td>
<td>.620</td>
</tr>
</tbody>
</table>

*Items are listed by the order of magnitude of the factor structure coefficients within each factor. Values greater than .4 are in bold.
Tukey’s HSD Test show that empathy scores for first-year students were significantly higher than for any of the subsequent years of dental school (p<.01). There were no significant differences between the subsequent classes (Figure 1).

### Table 2. Baseline demographic characteristics by empathy levels

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean</th>
<th>SD</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empathy levels for all</td>
<td>117.71</td>
<td>14.06</td>
<td></td>
</tr>
<tr>
<td>participants (n=130)**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Men (n=85)</td>
<td>115.28</td>
<td>14.17</td>
<td></td>
</tr>
<tr>
<td>Women (n=45)</td>
<td>122.29</td>
<td>12.76</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td>&lt;.20</td>
<td></td>
</tr>
<tr>
<td>White (n=105)</td>
<td>116.65</td>
<td>14.21</td>
<td></td>
</tr>
<tr>
<td>Asian (n=20)</td>
<td>121.50</td>
<td>11.50</td>
<td></td>
</tr>
<tr>
<td>Other (n=3)</td>
<td>126.33</td>
<td>18.72</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td>&lt;.66</td>
<td></td>
</tr>
<tr>
<td>Married (n=52)</td>
<td>117.35</td>
<td>13.18</td>
<td></td>
</tr>
<tr>
<td>Single (n=71)</td>
<td>117.15</td>
<td>14.33</td>
<td></td>
</tr>
<tr>
<td>Divorced (n=5)</td>
<td>124.60</td>
<td>20.51</td>
<td></td>
</tr>
</tbody>
</table>

* t-tests or analysis of variance procedures
** Range of empathy scores: 0 to 140

### Analysis of Results

Our findings suggest that the Jefferson Scale of Physician Empathy can reliably and validly assess levels of empathy in a dental student population. Internal consistency of the measure was quite high. The measure demonstrated good convergent validity by correlating with self-reported attitudes consistent with more biopsychosocial orientations toward the practice of health care and demonstrated good discriminant validity by not correlating with attitudes toward more technical skills of dentistry.

Further, the four-factor solution of the measure was similar to that found in medical students, residents, and physicians and demonstrated good construct validity of the measure.

Although the items administered in this survey corresponded to the JSPE-HP version and are slightly different from the student version of the JSPE, the resulting factor structure in this study is similar to that found for the student version of this measure. Hojat et al. found a four-factor solution with similar items loading on the factors. While we too found that a four-factor solution best represents the measure using the Kaiser criterion of factor se-

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**Figure 1.** Mean empathy levels ±SE by year of dental school training

*Indicates significant difference between first year and all other years of training (p<.001)
lection,\textsuperscript{32} it is important to note that an alternative method to choosing the number of factors is to observe the scree test.\textsuperscript{33} In this method, eigenvalues are examined and retained until there is a large drop in eigenvalue, that is, until the values seem to plateau. Using this alternative method, the items in this measure may best be represented by a single factor corresponding to the health care professional’s efforts to understand patients’ perspectives and emotional status.

**Conclusion**

As in other health care settings, the relationship between dentist and patient has a considerable impact on successful treatment and on patient and provider satisfaction. Empathy, the understanding of patients’ inner experiences and perspectives, combined with the ability to communicate this understanding,\textsuperscript{7,8} is integral to establishing and maintaining that relationship. This study demonstrated that empathy in dental students can be operationally defined and reliably and validly measured using a self-report instrument originally developed for the measurement of empathy in medical students.

Mean empathy levels for all dental students closely corresponded to norms for medical students and medical residents.\textsuperscript{25} However, results demonstrated that empathy levels during the first year of dental school are quite high and comparable to those reported in medical specialties such as psychiatry, but that empathy levels drop sometime during the second year of dental training and remain at this lower level throughout dental school. Of potential clinical and theoretical relevance, this is the same year that dental students begin to treat patients. It has been previously reported\textsuperscript{34,35} that decreases in empathy follow clinical experiences in medical students. For example, Hojat et al.\textsuperscript{35} observed a statistically significant drop in empathy levels in medical students from the beginning to the end of their third year of medical school. In medical school, students encounter patients on a regular basis during their third-year clinical clerkships. These clerkships typically consist of six- to eight-week focused rotations in the disciplines of family and internal medicine, obstetrics and gynecology, pediatrics, psychiatry, and surgery.\textsuperscript{35} Similar declines in empathy have also been observed during medical residency.\textsuperscript{36,37}

This paradoxical relationship can be explained several ways. At the most simplistic level, it may be that increased technical demands during intensive clinical training exhaust student resources and less essential skills and behaviors are sacrificed. This decrease may also occur as students approach graduation and place greater importance on their own needs, in this case credits based on completion of procedures, than on the needs of their patients. The requirement-driven environment of many dental schools may encourage students to be procedurally focused rather than patient-centered. Others have suggested that development of a sense of belonging to an elite and privileged group, such as being a doctor, contributes to declines in empathy.\textsuperscript{38} Declines in empathy may also be a defense that accompanies fear and insecurity when novice health care practitioners must first interact with patients.

An alternative explanation focuses on the impact of education to promote empathy and improve communication skills. A large body of evidence suggests that empathy and communication skills can improve from targeted training in both medical\textsuperscript{39-41} and dental professionals.\textsuperscript{42-44} The first-year winter quarter of the UW Dental School curriculum has considerable emphasis on behavioral science with courses in communication skills, cultural competence, and history taking. These classes emphasize the use of nonverbal behaviors (e.g., nodding consent, eye contact, body posture) and verbal behaviors such as reflection, validation, support, partnership, and respect that are demonstrative of empathetic communication. In the second and third years, this emphasis is reduced because of the relative importance and predominance of courses emphasizing the technical skills of dentistry. Thus, when students begin working with patients, they may come to realize that patients are not always willing to change their high-risk behaviors in the face of adverse health outcomes. This noncompliance may make it more difficult to feel empathy toward patients who do not or will not implement the student’s well-meaning, and often necessary, advice.

Although not statistically significant, it is interesting to note a slight increase in empathy levels in the last year of dental school. During their last year, students receive training in ethics, practice management, and management and treatment of fearful patients. It is possible and hopeful to consider that a gradual increase in empathy follows this final year of dental school training and continues beyond into practice or graduate education. In any case, these data suggest that education in behavioral science may be effective in increasing self-reported empathy and
that further training may be necessary in order to maintain high levels.

Consistent with previous findings on physicians and medical students, females in our sample scored significantly higher on the JSPE than males. This finding suggests that female students might render a different type of dental care based on a greater ability to empathize with the patient’s experiences and feelings. Physicians higher in empathy may spend more time on history taking or rapport building. Further research in the dental profession might focus on differences in aspects of treatment related to empathy.

This study has several limitations. First, it relies solely on self-reported measurement of empathy. Although the JSPE has been shown to be a reliable and valid indicator of the construct of empathy, it is limited to reflecting students’ orientation to empathy and not actual behaviors. Behavioral observation of activities during a practitioner and patient interaction as an adjunct to self-report would be a valuable addition to future research in the area. Second, the nature of the study was cross-sectional, and it is possible that cohort effects could account for the observed differences across dental school classes. Although the classes were similar on other variables, they may be dissimilar in empathy levels. A longitudinal study tracking changes in a single cohort through dental school and potentially beyond might offer considerably more insight into the stability of characteristics such as empathy in practice. Third, as our data are limited to one dental school, our findings may not generalize to all dental students. Future research may focus on multiple sites and larger samples.

The dentist-patient relationship can have a profound positive influence on a number of health behaviors and outcomes. Although empathy is an integral component to the relationship, there has been relatively little research on the topic. One possible reason is the absence of a psychometrically valid measure of the construct for the dental setting. Results from this study suggest that the JSPE provides a reliable and valid measure of empathy and that, based on that measure, empathy levels decrease during dental school. We suggest that students enter dental school with enormous capacity and intent to provide compassionate, patient-centered care and that training in the skills to do so should continue throughout dental school training and perhaps beyond.

**REFERENCES**


