Medical Students’ Exposure to the Humanities Correlates with Positive Personal Qualities and Reduced Burnout: A Multi-Institutional U.S. Survey

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BACKGROUND: Literature, music, theater, and visual arts play an uncertain and limited role in medical education. One of the arguments often advanced in favor of teaching the humanities refers to their capacity to foster traits that not only improve practice, but might also reduce physician burnout—an increasing scourge in today’s medicine. Yet, research remains limited.

OBJECTIVE: To test the hypothesis that medical students with higher exposure to the humanities would report higher levels of positive physician qualities (e.g., wisdom, empathy, self-efficacy, emotional appraisal, spatial skills), while reporting lower levels of negative qualities that are detrimental to physician well-being (e.g., intolerance of ambiguity, physical fatigue, emotional exhaustion, and cognitive weariness).

DESIGN: An online survey.

PARTICIPANTS: All students enrolled at five U.S. medical schools during the 2014–2015 academic year were invited by email to take part in our online survey.

MAIN MEASURES: Students reported their exposure to the humanities (e.g., music, literature, theater, visual arts) and completed rating scales measuring selected personal qualities.

KEY RESULTS: In all, 739/3107 medical students completed the survey (23.8%). Regression analyses revealed that exposure to the humanities was significantly correlated with positive personal qualities, including empathy (p < 0.001), tolerance for ambiguity (p < 0.001), wisdom (p < 0.001), emotional appraisal (p < 0.01), self-efficacy (p = 0.02), and spatial skills (p < 0.02), while it was significantly and inversely correlated with some components of burnout (p = 0.01). Thus, all hypotheses were statistically significant, with effect sizes ranging from 0.2 to 0.59.

CONCLUSIONS: This study confirms the association between exposure to the humanities and both a higher level of students’ positive qualities and a lower level of adverse traits. These findings may carry implications for medical school recruitment and curriculum design.

KEY WORDS: humanities; empathy; ambiguity; burnout; wisdom; medical education.

INTRODUCTION

Medicine today finds itself caught in a paradox. It has undoubtedly enjoyed many successes, and yet it is also the profession with the highest rate of suicide,1 a burnout rate greater than 50%,2 rampant depression,3 dwindling empathy,4 a negative view by the public,5 and a disturbing tendency for physicians to quit.6 This conundrum has prompted a search for a more balanced way to train healing physicians who can maintain their ideals and better cope with the challenges of medical practice. It has also led to a revisiting of the relationship between medicine and the humanities.

The two fields have been diverging for more than 100 years, first as a result of the “two cultures” split between the arts and sciences,7 and then because of medicine’s increasing skepticism of the humanities as being slippery, non-metric, hard to define, and essentially incompatible with an evidence-based approach. Yet given the aforementioned difficulties faced by today’s medicine, some educators have advocated a return to the humanistic roots of our craft.8 Accordingly, some medical schools have incorporated the humanities in their curriculum, and a few have even attempted to broaden students’...
undergraduate education by dropping the Medical College Admission Test (MCAT) as a requirement for admission. Although research has demonstrated that medical students with a humanistic background perform as well academically as their more traditional counterparts, there has not been an assessment of whether they might have advantages in more personal domains. Such work could be fundamental to inform revision of admission standards and curricula.

Physicians undoubtedly need skills, knowledge, and technical competence, and yet there are also other personal qualities that undeniably constitute “a well-rounded doctor.” Among these are wisdom, empathy, tolerance for ambiguities that undeniably constitute technical competence, and yet there are also other personal qualities. These were reverse-coded as necessary, so that higher scores indicated greater empathy. We postulated that the humanities might nurture these traits, and we thus designed a study that could assess whether exposure to the humanities is indeed associated with 1) empathy, 2) tolerance for ambiguity, 3) emotional appraisal, 4) prevention of burnout, 5) wisdom, 6) self-efficacy, and 7) spatial skills.

METHODS

Participants

To examine the relationship between exposure to the humanities and students’ psychosocial qualities, we developed an online survey and then administered it at five U.S. medical schools: 1) Sidney Kimmel Medical College at Thomas Jefferson University, 2) Tulane University School of Medicine, 3) The Warren Alpert Medical School of Brown University, 4) Oregon Health & Science University School of Medicine, and 5) Cooper Medical School of Rowan University.

Data Collection

At each school, a faculty representative introduced the survey and then emailed it to all students enrolled during the 2014–2015 academic year. Representatives also sent periodic reminders, and the survey remained accessible for 7 months. This project was exempted by the institutional review board at each institution.

Survey Measures

The survey instrument comprised three parts: 1) respondent demographic and background information, 2) questions related to exposure to the humanities, and 3) measurement scales for personal qualities. These were reverse-coded as necessary, scored, and summed to create composites for analyses. Completion of the survey required approximately 45 min.

Demographic and Background Information

In addition to typical demographics such as gender, age and ethnicity, we collected college major/minor in humanistic/
emotions” (self-emotional appraisal), and “I always know how my friends are feeling from their behavior” (appraisal of others’ emotions).

**Self-Efficacy.** This was measured by a 10-item generalized self-efficacy scale ($\alpha = 0.85$). Responses range across a four-point Likert scale (1 = not at all true to 4 = exactly true). A sample item is: “Thanks to my resourcefulness, I can handle unforeseen situations.”

**Burnout.** This was measured by the three subscales of the Shirom-Melamed Burnout Measure (physical fatigue, $\alpha = 0.92$; cognitive weariness, $\alpha = 0.92$; and emotional exhaustion, $\alpha = 0.90$). Sample items are: “I feel physically drained” (physical fatigue), “I have difficulty concentrating” (cognitive weariness), and “I feel I am unable to be sensitive to the needs of coworkers” (emotional exhaustion). Responses range across a seven-point Likert scale (0 = never/almost never to 6 = almost always/always).

**Spatial Skills.** We included a measurement of spatial ability, since it not only plays a role in creativity, but also represents exhaustion). Responses range across a seven-point Likert scale (1 = not at all true to 7 = completely true). A sample item is: “Thanks to my resourcefulness, I can handle unforeseen situations.”

We then conducted multivariate linear regression analyses using the general linear model in SPSS version 22 software (IBM Corp., Armonk, NY) and the four factors identified in our exploratory factor analysis (Table 3). To determine the general effect that humanities exposure had on each of these variables, we calculated Cohen’s $d$ (herein referred to as $d$) using the partial eta squared ($\eta_p^2$) resulting from the regression analyses. According to the operational definition, effect sizes around 0.50 were considered moderate, and effect sizes greater than 0.75 were considered highly important.

### RESULTS

Out of 3107 students enrolled at the participating institutions, 912 (29.3%) responded. Of these, 173 individuals failed to complete at least 80% of the survey, which was deemed the minimum required for a valid response. The remaining 739 respondents (81%) were included in the final analysis. Participant demographics, broken down by medical school, are reported in Table 4.

Respondents were slightly more likely to be female (53%) than male (47%), and ranged in age as follows: 18–21 (1%), 22–24 (30%), 25–27 (45%), and >27 years (24%). Respondents identified as Caucasian (69%), Asian (16%), Hispanic/Latino (4%), African-American (3%), and American Indian/Alaskan Native (<1%). The remainder selected two or more ethnic backgrounds.

Results from our first multivariate regression showed that humanities exposure significantly predicted all personal qualities in Factor 1. Specifically, exposure to the humanities most strongly predicted wisdom ($B = 0.59, SE[B] = 0.07, p < 0.001, d = 0.59$), followed by appraisal of others’ emotions ($B = 0.12, SE[B] = 0.03, p < 0.001, d = 0.29$) and self-emotional appraisal ($B = 0.09, SE[B] = 0.03, p < 0.01, d = 0.20$). Humanities exposure also significantly predicted self-efficacy, the final personal quality in Factor 1 ($B = 0.08, SE[B] = 0.03, p = 0.02, d = 0.20$).

A second multivariate regression showed that humanities exposure was a significant negative predictor of the various components of burnout (Factor 2). Specifically, as levels of humanities exposure increased, physical fatigue ($B = -0.19, SE[B] = 0.06, p = 0.001, d = 0.29$), emotional exhaustion ($B = -0.09, SE[B] = 0.03, p < 0.001, d = 0.29$), and cognitive weariness ($B = -0.11, SE[B] = 0.04, p = 0.01, d = 0.20$) all decreased. The effect sizes ($d$) also suggested that exposure to the humanities had a stronger negative association with physical fatigue and emotional exhaustion than cognitive weariness.

Results of a final multivariate regression showed that humanities exposure was significantly associated with openness (Factor 3). In fact, exposure to the humanities significantly predicted tolerance for ambiguity by the largest effect size of all variables analyzed ($B = 0.58, SE[B] = 0.07, p < 0.001, d = 0.63$). Humanities exposure also significantly predicted
empathy—the other variable in Factor 3 ($B = 0.60$, $SE[B] = 0.09$, $p < 0.001$, $d = 0.46$).

Lastly, linear regression results showed that humanities exposure also significantly predicted spatial skills (Factor 4; $B = 0.09$, $SE[B] = 0.04$, $p = 0.02$, $d = 0.20$).

### Table 2 Factor Analysis of Dependent Variables

<table>
<thead>
<tr>
<th>Factors</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wisdom</td>
<td>0.66</td>
<td>−0.24</td>
<td>0.35</td>
<td>0.25</td>
</tr>
<tr>
<td>Emotional appraisal – others</td>
<td>0.70</td>
<td>0.05</td>
<td>0.37</td>
<td>−0.19</td>
</tr>
<tr>
<td>Emotional appraisal – self</td>
<td>0.82</td>
<td>−0.07</td>
<td>0.08</td>
<td>−0.12</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.69</td>
<td>−0.19</td>
<td>−0.15</td>
<td>0.38</td>
</tr>
<tr>
<td>Cognitive weariness</td>
<td>−0.11</td>
<td>0.89</td>
<td>−0.01</td>
<td>−0.09</td>
</tr>
<tr>
<td>Physical fatigue</td>
<td>−0.00</td>
<td>0.88</td>
<td>−0.01</td>
<td>−0.09</td>
</tr>
<tr>
<td>Emotional exhaustion</td>
<td>−0.24</td>
<td>0.58</td>
<td>−0.36</td>
<td>0.17</td>
</tr>
<tr>
<td>Jefferson Scale of Empathy</td>
<td>0.32</td>
<td>−0.05</td>
<td>0.77</td>
<td>−0.13</td>
</tr>
<tr>
<td>Tolerance for ambiguity</td>
<td>−0.02</td>
<td>−0.02</td>
<td>0.78</td>
<td>0.33</td>
</tr>
<tr>
<td>Spatial skills</td>
<td>0.01</td>
<td>0.02</td>
<td>0.10</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Rotation converged in five iterations, extraction method: principal component analysis. Rotation method: varimax with Kaiser normalization. Bolded values indicate to which factor the variable belongs. Factor membership suggests that the variables within a factor are highly correlated and have an underlying similarity or shared construct. Results indicate that there are four unique factors: personal qualities (wisdom, appraisal of others’ emotions, self-emotional appraisal, and self-efficacy), burnout (cognitive weariness, physical fatigue, emotional exhaustion), openness (empathy and tolerance for ambiguity), and spatial skills.

**DISCUSSION**

This multi-institutional study supports the research hypothesis: students’ exposure to the humanities is linked to important personal qualities and prevention of burnout. The qualities we measured are neither part of the admissions process nor regularly tested during standardized board examinations, and yet they may affect both patient satisfaction and outcome, as well as cost and quality of care. Hence, this study may carry implications for both admission standards and professional development.

Our survey suffered from a few limitations, including recall and reporting biases, plus a relatively low return rate, not uncommon in survey-driven designs, especially one like ours that required significant time. Additionally, removing participants who failed to complete at least 80% of the survey further reduced responses from 912 to 739. We did not attempt to measure whether censored responses would have made a significant impact, and of course a low response rate might have invited selection bias. Yet our return was still close to 24%, which is nearly double the average of 10–15% for external surveys. Furthermore, by conducting the study at multiple locations, we increased our response representativeness, which has been cited as being more important than the actual response rate. Lastly, the observational nature of our cohort study identifies only correlations, not causation. Further
studies in which exposure to the humanities serves as intervention would be needed to better clarify their role.

Nevertheless, our results suggest that the humanities do correlate with important physician qualities. Of interest, the three personal qualities that correlated most strongly with exposure to the humanities were tolerance of ambiguity, empathy, and wisdom. This is intuitive considering that the humanities are not only a way to teach compassion and tolerance, but also represent the wisdom of those who came before us. In fact, wisdom might very well be the single trait that encompasses all of those other traits which define a well-rounded doctor: empathy, openness to possibilities, emotional resilience, mindfulness, humility, altruism, a knack for learning from life, plus a cathartic sense of humor. However, wisdom is not a focus of today’s medical education, which concentrates primarily on information and knowledge. Ironically, knowledge without wisdom might be dangerous.35 As Socrates put it in Menexenus, “all knowledge, when separated from justice and virtue, is seen to be cunning, and not wisdom.”36

Forthy years ago, bioethicist Edmund Pellegrino suggested that well-rounded physicians share three main characteristics: competence, compassion, and education.37 Few would disagree with the need for competence and compassion, but the issue of “education”—in Pellegrino’s description, a “liberal arts” education, i.e. culture—has received much less attention. Yet, it is the one ingredient whose presence was considered fundamental until the 1910 Flexner report. Writing in 1902 about the “four great features of [our] guild,” Osler described medicine as the profession of a “cultivated” person. Flexner himself included in his 346-page report an often forgotten passage where he mentioned the “varied and enlarging cultural experience” he considered so important to the education of physicians.38 More recently, Lewis Thomas8 and Sherwin Nuland40 urged a return to the humanities as the ideal repository of the moral and cultural knowledge required of physicians. However, being “cultivated” is no longer a tenet of the profession.

In fact, humanistic fields are often spoken of as though they were a waste of time. But as was reported to Congress by Richard H. Brodhead, the president of Duke University and co-chair of the Commission on the Humanities & Social Sciences, “this facile negativism forgets that many of the country’s most successful and creative people had exactly this kind of education.”41, 42 Others have echoed his opinion,43, 44 and business leaders like Google prioritize applicants with a liberal arts education.45 The humanities may even foster a different way of seeing, thinking, and feeling,46 that can then

Table 3 Regression Analyses of Variables of Interest as Outcomes of Humanities Exposure

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>B</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>Lower bound</th>
<th>Upper bound</th>
<th>Partial $\eta^2$</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multivariate regression – Factor 1: Personal qualities</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wisdom</td>
<td>0.59</td>
<td>0.07</td>
<td>8.00</td>
<td>&lt;0.001</td>
<td>0.44</td>
<td>0.73</td>
<td>0.08</td>
<td>0.59</td>
</tr>
<tr>
<td>Emotional appraisal – others</td>
<td>0.12</td>
<td>0.03</td>
<td>3.73</td>
<td>&lt;0.001</td>
<td>0.05</td>
<td>0.18</td>
<td>0.02</td>
<td>0.29</td>
</tr>
<tr>
<td>Emotional appraisal – self</td>
<td>0.09</td>
<td>0.03</td>
<td>2.53</td>
<td>0.01</td>
<td>0.02</td>
<td>0.15</td>
<td>0.01</td>
<td>0.20</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.08</td>
<td>0.03</td>
<td>2.43</td>
<td>0.02</td>
<td>0.01</td>
<td>0.14</td>
<td>0.01</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Table 4 Respondent Demographics Broken Down by Medical School

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>All</th>
<th>TJU</th>
<th>Tulane</th>
<th>Brown</th>
<th>Oregon</th>
<th>Rowan</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–21</td>
<td>8 (1.1%)</td>
<td>3 (1.7%)</td>
<td>0 (0%)</td>
<td>3 (1.8%)</td>
<td>0 (0%)</td>
<td>2 (1.9%)</td>
</tr>
<tr>
<td>22–24</td>
<td>214 (29.8%)</td>
<td>43 (24.9%)</td>
<td>51 (26.4%)</td>
<td>62 (36.7%)</td>
<td>14 (18.7%)</td>
<td>44 (40.7%)</td>
</tr>
<tr>
<td>25–27</td>
<td>316 (44.0%)</td>
<td>90 (52.0%)</td>
<td>83 (43.0%)</td>
<td>71 (42.0%)</td>
<td>29 (38.7%)</td>
<td>43 (39.8%)</td>
</tr>
<tr>
<td>&gt;27</td>
<td>178 (24.8%)</td>
<td>36 (20.8%)</td>
<td>59 (30.6%)</td>
<td>32 (18.9%)</td>
<td>19 (17.6%)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Sex</th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>372 (51.8%)</td>
<td>91 (52.6%)</td>
<td>91 (47.2%)</td>
<td>89 (52.7%)</td>
<td>45 (60.0%)</td>
<td>56 (51.9%)</td>
</tr>
<tr>
<td>Male</td>
<td>341 (47.5%)</td>
<td>81 (46.8%)</td>
<td>102 (52.8%)</td>
<td>79 (46.7%)</td>
<td>29 (38.7%)</td>
<td>50 (46.3%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race</th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>17 (16.3%)</td>
<td>29 (16.8%)</td>
<td>17 (8.8%)</td>
<td>47 (27.8%)</td>
<td>7 (9.3%)</td>
<td>17 (15.7%)</td>
</tr>
<tr>
<td>Black</td>
<td>23 (3.2%)</td>
<td>0 (0%)</td>
<td>5 (2.6%)</td>
<td>9 (5.3%)</td>
<td>0 (0%)</td>
<td>9 (8.3%)</td>
</tr>
<tr>
<td>Latino</td>
<td>28 (3.9%)</td>
<td>3 (1.7%)</td>
<td>4 (2.1%)</td>
<td>17 (10.1%)</td>
<td>0 (0%)</td>
<td>4 (3.7%)</td>
</tr>
<tr>
<td>White</td>
<td>493 (68.7%)</td>
<td>129 (74.6%)</td>
<td>152 (78.8%)</td>
<td>82 (48.5%)</td>
<td>64 (85.3%)</td>
<td>66 (61.1%)</td>
</tr>
<tr>
<td>Other</td>
<td>49 (6.8%)</td>
<td>10 (5.8%)</td>
<td>13 (6.7%)</td>
<td>11 (6.5%)</td>
<td>4 (4.3%)</td>
<td>11 (10.2%)</td>
</tr>
</tbody>
</table>

TJU, Thomas Jefferson University
be used in any field of endeavor—and especially in one like medicine, which deals primarily with the human condition. The humanities might actually provide an indispensable language for exploring that strange, nuanced, and often nonsensical land called the human condition.

The humanities may indeed promote the very personal qualities we measured. For instance, observing drama increases empathy, as does the performance of acting techniques; an elective course in medical humanities called the human condition.

language

The importance of wide-ranging interests raises the issue of whether exposure to the humanities might not be the true correlate of students’ desirable qualities, but instead a reflection of some other variable we did not measure. In a 1999 essay, Dr. Faith Fitzgerald asked this question, and concluded that what may really determine students’ desirable traits is curiosity. This has received limited attention in medical education research. In fact, current education practices may even hamper curiosity. But it is possible that interest in other activities, such as religious practice or meditation, volunteer work, sports, or politics, may similarly benefit the mental lives of our medical students.

Last, exposure to the humanities plays a role in fostering important traits, what is more beneficial: an active or a passive student’s involvement? In our study, post hoc analyses remained significant regardless of whether we included active, passive, or both types of involvement. This suggests that the link between our variables of interest is robust, but also prompts further questions as we seek to better understand the role played by the humanities, whether in fact they can be taught or instead should be a prerequisite for medical school admission, and lastly, how an omnivorous curiosity might not only be of benefit but also be preserved during medical education.

In summary, our study empirically confirms what many have intuitively suspected for years: exposure to the humanities is associated with both important personal qualities and prevention of burnout. In fact, one could argue that some of the qualities we measured (tolerance for ambiguity, empathy, emotional appraisal of self and others, resilience) are, together with wisdom, fundamental components of professionalism. Hence, if we wish to create wiser, more tolerant, empathetic, and resilient physicians, we might want to reintegrate the humanities in medical education. This is nothing new.

Commenting more than 100 years ago on the risk of burnout, Rudolf Virchow exhorted students to cultivate the humanities: “You can soon become so engrossed in study, then [in] professional cares, [then] in getting and spending, you may so lay waste your powers that you find too late with hearts given away that there is no place in your habit-stricken souls for those gentler influences that make life worth living.”

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