Relationship Between Burnout and Professional Conduct and Attitudes Among US Medical Students

Liselotte N. Dyrbye, MD, MHPE
F. Stanford Massie Jr, MD
Anne Eacker, MD
William Harper, MD
David Power, MD, MPH
Steven J. Durning, MD
Matthew R. Thomas, MD
Christine Moutier, MD
Tait D. Shanafelt, MD

Context The relationship between professionalism and distress among medical students is unknown.

Objective To determine the relationship between measures of professionalism and burnout among US medical students.

Design, Setting, and Participants Cross-sectional survey of all medical students attending 7 US medical schools (overall response rate, 2682/4400 [61%]) in the spring of 2009. The survey included the Maslach Burnout Inventory (MBI), the PRIME-MD depression screening instrument, and the SF-8 quality of life (QOL) assessment tool, as well as items exploring students’ personal engagement in unprofessional conduct, understanding of appropriate relationships with industry, and attitudes regarding physicians’ responsibility to society.

Main Outcome Measures Frequency of self-reported cheating/dishonest behaviors, understanding of appropriate relationships with industry as defined by American Medical Association policy, attitudes about physicians’ responsibility to society, and the relationship of these dimensions of professionalism to burnout, symptoms of depression, and QOL.

Results Of the students who responded to all the MBI items, 1354 of 2566 (52.8%) had burnout. Cheating/dishonest academic behaviors were rare (endorsed by <10%) in comparison to unprofessional conduct related to patient care (endorsed by up to 43%). Only 14% (362/2531) of students had opinions on relationships with industry consistent with guidelines for 6 scenarios. Students with burnout were more likely to report engaging in 1 or more unprofessional behaviors than those without burnout (35.0% vs 21.9%; odds ratio [OR], 1.89; 95% confidence interval [CI], 1.59-2.24). Students with burnout were also less likely to report holding altruistic views regarding physicians’ responsibility to society. For example, students with burnout were less likely to want to provide care for the medically underserved than those without burnout (79.3% vs 85.0%; OR, 0.68; 95% CI, 0.55-0.83). After multivariable analysis adjusting for personal and professional characteristics, burnout was the only aspect of distress independently associated with reporting 1 or more unprofessional behaviors (OR, 1.76; 95% CI, 1.45-2.13) or holding at least 1 less altruistic view regarding physicians’ responsibility to society (OR, 1.65; 95% CI, 1.35-2.01).

Conclusion Burnout was associated with self-reported unprofessional conduct and less altruistic professional values among medical students at 7 US schools.

JAMA. 2010;304(11):1173-1180

See also pp 1181 and 1231.

©2010 American Medical Association. All rights reserved.
personal distress (such as depression or low mental quality of life [QOL]) and professional distress (such as burnout) relate to professionalism is largely unexplored. Previous studies suggest that distress is associated with decreased empathy\textsuperscript{11-14} and decreased quality of care,\textsuperscript{13,15-17} which has led to a conceptual framework that posits that distress can lead to unprofessional behaviors and attitudes.\textsuperscript{14}

To explore this relationship, we conducted a large, multi-institutional study that measured multiple dimensions of professionalism and assessed its relationship to burnout and other measures of distress using validated metrics. We hypothesized that professional conduct, attitudes regarding appropriate relations with industry, and attitudes regarding physicians’ responsibility to society are influenced more by medical students’ degree of professional distress than personal distress.

**METHODS**

**Participants**

All medical students at Mayo Medical School, University of Washington School of Medicine, University of Chicago Pritzker School of Medicine, University of Minnesota Medical School, University of Alabama School of Medicine, University of California-San Diego School of Medicine, and the Uniformed Services University of the Health Sciences were eligible to participate. These schools were chosen due to their diverse student population, variation in size, geographic location, public/private status, and the presence of a local investigator willing to complete the site-specific tasks necessary for student participation. The institutional review board at each school approved the study prior to participation of its students.

**Data Collection**

In the spring of 2009, students were e-mailed a letter informing them of the study. Although some details of the cover letter varied by school due to local institutional review board requirements, all letters indicated that participation was voluntary, responses were confidential, and data would be anonymized. A link was included to an electronic survey form. Students who did not respond to the e-mail received a paper version of the cover letter and survey by mail. Informed consent was implied upon return of the survey. No incentive was provided for participation.

**Study Measures**

**Burnout, Symptoms of Depression, and QOL.** Burnout was measured by the Maslach Burnout Inventory (MBI),\textsuperscript{18} which is considered the criterion standard.\textsuperscript{19} Burnout encompasses 3 domains (emotional exhaustion [score range 0-54], depersonalization [score range 0-30], personal accomplishment [score range 0-48]), which have been confirmed in factor analyses.\textsuperscript{18} Reliability evidence is supported by Cronbach coefficient $\alpha$ of 0.90 for emotional exhaustion, 0.79 for depersonalization, and 0.71 for low sense of personal accomplishment in large population samples.\textsuperscript{15} Previously demonstrated relationships between burnout and suicidal ideation,\textsuperscript{20} serious thoughts of dropping out,\textsuperscript{21} and low empathy\textsuperscript{22} among medical students provide validity evidence. For the current study, scores within individual burnout domains were used both as continuous variables and categorized into low, intermediate, and high scores using established cutoffs.\textsuperscript{15} Because high scores on either the emotional exhaustion ($\geq$27) or depersonalization ($\geq$10) scales can distinguish clinically burned out from non–burned out individuals,\textsuperscript{22} burnout as a dichotomous variable was defined as having high emotional exhaustion and/or high depersonalization.

The 2-item Primary Care Evaluation of Mental Disorders (PRIME-MD) was used to screen for depression.\textsuperscript{23} A positive depression screen is defined as a positive response to either of the 2 items. The PRIME-MD performs similar to longer instruments\textsuperscript{24} and has a sensitivity of 86% to 96% and a specificity of 57% to 75% for major depressive disorder.\textsuperscript{23,24}

Quality of life was measured using the psychometrically sound Medical Outcomes Study Short-Form (SF-8, range 0-100)\textsuperscript{25} with norm-based scoring methods used to calculate mental and physical QOL summary scores.\textsuperscript{25,26} The mean (SD) mental and physical QOL summary scores for the US population are 49.2 (9.46) and 49.2 (9.07), respectively.\textsuperscript{25}

**Measures of Professional Conduct and Attitudes.** Items inquiring about professional conduct and attitudes representative of professionalism are shown in eBox (available at http://www.jama .com). The items exploring whether students had engaged in cheating/dishonest clinical behaviors were derived from previous studies of medical students.\textsuperscript{5-8} The items regarding physicians’ responsibility to society were derived from the Medical Students’ Attitudes Toward Providing Care for the Underserved (MSATU) instrument.\textsuperscript{27} Internal consistency for the total MSATU scale is 0.92 and test-retest reliability has been demonstrated.\textsuperscript{3} For these items, students were asked to indicate their level of agreement with each statement on a 5-point Likert scale (strongly agree, agree, neutral, disagree, strongly disagree). Responses were dichotomized to agree (strongly agree, agree) or neutral/disagree (neutral, disagree, strongly disagree) for analysis.

Because medical students have substantial exposure to the promotional tactics of the pharmaceutical industry\textsuperscript{5} and managing professional conflicts of interest is an important aspect of professionalism, we included items assessing students’ views regarding what represented appropriate relationships with industry. These items regarding conflicts of interest in relationships with industry were derived from the American Medical Association (AMA) Ethical Guidelines of Gifts to Physicians from Industry.\textsuperscript{29,30} Students were asked about the appropriateness of accepting various gifts from pharmaceutical representatives or attending industry-sponsored events. These items were taken nearly verbatim from the AMA policy.\textsuperscript{29,30} Accepting $500 after com-
pleting a short survey, attending dinner at an expensive restaurant, or accepting movie coupons or meals from pharmaceutical representatives are specifically banned by the AMA policy while accepting textbooks (eg, pocket antimicrobial book) and small, noneducational gifts (eg, pens) are allowable under the AMA policy.

Statistical Analysis
The large sample size provided high precision. With 2682 observations, percentages are accurate to within 2 percentage points with 95% confidence; mean values are accurate to within 2% of the standard deviation of the variable involved, a very small effect size. Statistical power to detect an odds ratio (OR) of 1.1 for those who endorsed at least 1 unprofessional behavior was more than 90%.

Standard descriptive summary statistics were used to characterize the sample. Differences in a dependent outcome variable by independent variables were evaluated using the Kruskal-Wallis test (continuous variables) or χ² test (categorical variables) as appropriate. All tests were 2-sided with type I error rates of .05. Participants were excluded from individual analyses if their data involved in the comparison were missing.

Bivariate logistic regression was performed to evaluate the relationship between burnout and individual cheating/dishonest clinical behaviors, attitudes toward appropriate relationships with industry, and beliefs about physicians' responsibility to society. For multivariable analysis, forward stepwise logistic regression was performed to evaluate associations of all independent demographic and distress variables with engaging in 1 or more cheating/dishonest clinical behaviors and disagreeing with 1 or more of the responsibility to society items. Logistic regression with backward stepping confirmed results of the initial stepwise regression. In both forward and backward stepping models, a significance level of .05 was used as an entry threshold. Saturated models that included all of the variables confirmed the findings of the stepwise models. Because each school has its own culture, method for selecting matriculates, learning environment, and curriculum, we also repeated the multivariable analysis and controlled for site (school) in the model. All analyses were conducted using Linux SAS 9.2 (SAS Institute Inc, Cary, North Carolina).

RESULTS
Of the 4400 eligible students, 2682 (61%) completed the survey. The number of participating students from each school ranged from 105 to 604 (largely based on school size), with the 7 individual response rates of 51%, 55%, 60%, 62%, 63%, 64%, and 66%. Characteristics of responders were generally similar to the overall study population; however, responders were slightly less likely to be male (51.4% vs 54.9%), be 25 to 30 years old (56.3% vs 61.5%), be nonwhite (68.4% vs 78.4%), or be third- or fourth-year students (response rate by year in school: 65.4%, 63.4%, 59.6%, and 52.6% for first-, second-, third-, and fourth-year students, respectively) than the overall population.

Table 1 shows the demographic characteristics, burnout, QOL, and depressive symptoms of participants. Approximately 49% of respondents were female compared with 47.8% of all enrolled medical students nationally in 2009, 30.4% were married compared with 32.4% nationally in 1996 (the last time the Association of American Medical Colleges [AAMC] Graduation Questionnaire included a question about marital status), and 11.5% had children compared with 12.9% nationally in 1995 (the last time the AAMC Graduation Questionnaire included a question about having children).31,32

Professional Conduct, Relationships With Industry, and Views Regarding Physicians' Responsibility to Society
Data regarding students' self-reported conduct, understanding about conflicts of interest in relationships with industry, and attitudes regarding physicians' responsibility to society are shown in Table 2. Few students reported hav-
ing copied from a “crib sheet” or another student during a closed-book examination (n=37, 1.5%), having allowed another student to copy from them during an examination (n=12, 0.5%), or having taken credit for another person’s work (n=15, 0.6%). Dishonest clinical behaviors, particularly reporting a physical examination finding as normal when it had been inadvertently omitted from the physical examination (n=499; 43.3%), were among the most commonly reported unprofessional behaviors.

Students frequently had opinions inconsistent with the AMA policy on conflicts of interest in relationships with industry. For example, 567 (22.4%) thought it was appropriate to accept $500 from an industry representative after completing a short survey. Only 14% (362/2531 [151 had missing data for ≥1 of the industry items]) of students’ opinions on relationships with industry aligned with the AMA policy for all 6 scenarios. Fourth-year students were only slightly more likely than students in years 1 through 3 to answer all 6 questions on relationships with industry in a manner consistent with AMA policy (17.4% vs 13.4%; P=.02).

Most students (64.4%-90.2%) held altruistic positions with respect to physicians’ responsibility to society.

### Professionalism and Burnout

Students with burnout were significantly more likely to have engaged in each of the cheating/dishonest clinical behaviors evaluated, with the exception of taking credit for another person’s work (Table 2). For example, behaviors such as copying from a crib sheet or from another student during a closed-book examination (2.1% vs 0.8%; OR, 2.56; 95% confidence interval [CI], 1.24-5.29) or reporting a
physical examination finding as normal when it had been omitted (49.0% vs 35.8%; OR, 1.73; 95% CI, 1.37-2.18) were more common among students with burnout. In aggregate, students with burnout were more likely to have engaged in 1 or more unprofessional behaviors than those without burnout (35.0% vs 21.9%; OR, 1.89; 95% CI, 1.59-2.24).

A similar relationship between cheating and dishonest clinical behaviors was found when the individual domains of burnout were treated as continuous variables. Mean emotional exhaustion and depersonalization scores were also higher among those reporting a greater number of cheating/dishonest clinical behaviors (both \(P < .001\)) (Figure).

Burned-out students were also less likely to hold altruistic views regarding physicians’ responsibility to society, including personally wanting to provide care for the medically underserved (79.3% vs 85.0%; OR, 0.68; 95% CI, 0.55-0.83). Each 1-point increase in depersonalization score (OR, 0.93-0.98; 95% CI, 0.91-0.99) and emotional exhaustion score (OR, 0.97-0.99; 95% CI, 0.96-1.0) and 1-point decrease in personal accomplishment score (OR, 0.93-0.97; 95% CI, 0.92-0.98) was associated with lower odds of holding altruistic views regarding physicians’ responsibility to society for each of the attitudes explored, with the exception of 2 items (provision of medical care without charge to those who cannot pay and universal entitlement to medical care), which were associated with depersonalization and low sense of personal accomplishment but not emotional exhaustion.

The relationship between burnout and opinions regarding appropriate relationships with industry was less consistent. Each 1-point increase in depersonalization score (ORs from 1.02-1.04; 95% CIs from 1.005-1.057) and 1-point decrease in personal accomplishment score (ORs from 1.015-1.025; 95% CIs from 1.002-1.037) was associated with increased odds of viewing the event/gift as acceptable for the potential conflicts of interest explored, with the exception of 2 items (attend a dinner at an expensive restaurant and accept a pocket book), which were associated with depersonalization but not personal accomplishment. No association was observed between conflicts of interest items and emotional exhaustion.

**Professionalism and Personal Distress**

Although 10 of the 12 items on professional conduct and attitudes regarding physicians’ responsibility to society were significantly associated with burnout, only 5 of 12 items were associated with depression or mental/physical QOL. Students with a positive depression screen were more likely to report having copied during a closed-book examination (2.2% vs 0.9%; OR, 2.48; 95% CI, 1.24-4.98), having reported a physical finding as normal when it had been omitted in the examination (48.5% vs 38.1%; OR, 1.53; 95% CI, 1.22-1.92), and saying that a test had been ordered when it had not (8.9% vs 5.8%; OR, 1.60; 95% CI, 1.03-2.48), and were less likely to report feeling they could make an impact on the problems of the medically underserved (61.4% vs 67.9%; OR, 0.75; 95% CI, 0.64-0.88). No relationships were found between depression and attitudes about industry-sponsored events/gifts. The few relationships that were found between the items and mental/physical QOL scores were small (mean difference of 0.5-2.3) and unlikely to be clinically meaningful. These findings suggest that the association between cheating/dishonest clinical behaviors and students’ views regarding physicians’ responsibility to society are more specific to burnout (ie, professional distress) rather than simply distress in general.

**Factors Associated With Professionalism on Multivariable Analysis**

Results of multivariable analysis are shown in Table 3. Burnout was the only aspect of distress independently associated with report of 1 or more cheating/dishonest clinical behaviors (OR, 1.76; 95% CI, 1.45-2.13; \(P < .001\)) or with disagreeing with 1 or more altruistic attitudes regarding physicians’ responsibility to society (OR, 1.65; 95% CI, 1.35-2.01; \(P < .001\)) after adjusting for demographic characteristics (sex, age, parental status, marital status, year in school, student debt load), burnout, positive depression screen, mental QOL, and physical QOL. These relationships between dimensions of professionalism and burnout also persisted after controlling for site.

In contrast, students with a positive depression screen or poor mental/physical QOL were not more likely to engage in cheating/dishonest clinical behaviors or have less altruistic professional values. The multivariable analysis suggested few relationships between demographic characteristics and cheating/dishonest clinical behaviors or attitudes regarding physicians’ responsibility to society. Male medical students were more likely to report cheating/dishonest behaviors (OR, 1.37; 95% CI, 1.13-1.66) and to disagree with 1 or more of the altruistic attitudes regarding physicians’ responsibility to society (OR, 2.25; 95% CI, 1.84-2.75). Students with children were less likely to report engaging in cheating/dishonest behaviors (OR, 0.72; 95% CI, 0.54-0.97).
COMMENT

In this large, multi-institutional study, self-reported cheating and dishonest clinical behaviors showed a direct association with burnout, while altruistic professional values regarding physicians' responsibility to society showed an inverse relationship with burnout. The depersonalization domain of burnout was also associated with the belief that it is acceptable to engage in relationships with industry that are inconsistent with the AMA policy statement. In contrast, there were few relationships between depression or mental/physical QOL and cheating/dishonest clinical behaviors, attitudes toward industry, or altruistic professional values. These findings are in keeping with the theoretic framework that burnout primarily affects the professional domain, whereas personal distress (such as a low mental QOL) often has greater initial effect on personal domains (eg, relationship difficulties or substance abuse), with a secondary effect on the professional domain depending on chronicity and severity.

Although students recognize cheating and dishonest clinical behaviors as unprofessional, feel guilty about engaging in these behaviors, and believe that the behaviors may make them less trustworthy physicians, a relatively high prevalence of unprofessional conduct related to patient care was reported by students in this study. These results confirm findings from re-
search conducted more than a decade ago. The fact that students frequently engage in dishonest behaviors despite knowing they are inappropriate may imply that some elements of the learning climate foster dishonesty. This could lead to a situation in which students are more willing to falsely report physical examination findings than admit they performed an incomplete exam. In addition to students’ fear of poor evaluations and a desire to fit in with the team, this study suggests that burnout may be another important variable contributing to unprofessional behavior.

Students with burnout were also less likely to hold altruistic views regarding physicians’ responsibility to society, suggesting that professional attitudes and advocacy may be vulnerable to professional distress. The relationship between burnout and medical students’ opinions about physicians’ responsibility to society raises larger questions for physicians in general. If this association is also true in practicing physicians, it implies that burnout may color physicians’ views on their responsibility to promote the public health, advocate for patients, and reduce barriers to equitable healthcare. These responsibilities of physicians are particularly important as the United States attempts to reform its health care system, and the effect of burnout in this area merits further study in practicing physicians.

Many medical students in this study had opinions about relationships with the pharmaceutical industry inconsistent with well-established policies on conflict of interest, findings consistent with previous studies. These data suggest that medical schools and educators could do a better job teaching students about conflict of interest and appropriate relationships with industry. School-wide policies may help address this deficiency in conjunction with larger institutional efforts.

This study has a number of limitations. First, only a limited number of behaviors and attitudes representative of professionalism were assessed. Second, the study relied on self-reported behavior rather than observed behavior, with the potential for recall bias and reporting bias. Students may under-recall or underreport unprofessional conduct, and these results may therefore represent a conservative estimate of the frequency of these unprofessional behaviors. While it could be argued that students should have been asked whether they had actually attended industry-sponsored events or accepted gifts from industry, this approach is subject to opportunity bias. For students who reported not having engaged in inappropriate relationships with industry, it would fail to identify whether this was because they had not had the opportunity or were adhering to accepted professional standards.

Third, although the study suggests associations between the factors evaluated, it does not determine if these relationships are causal. It is plausible that students who engage in unprofessional conduct are more vulnerable to becoming burned out. A longitudinal study is needed to provide a more definitive answer to the question about causation and directionality and also to explore how frequently unprofessional behaviors become recurrent behaviors as opposed to isolated lapses in judgment. However, regardless of directionality, the study findings are notable given the high prevalence of burnout among medical students.

Fourth, although the number of responders was large and the response rate of 61% is high for multi-institutional surveys, response bias remains a possibility. Fifth, despite the large sample size, some of the behaviors examined were endorsed by few students. When examining such behaviors based on categorical characteristics (burned out vs not burned out), it is possible for the subset of respondents who endorsed a specific behavior to fall entirely into one category, leading to an unstable OR with wide CIs. However, when the relationships between continuous scores on the individual domains of burnout and the professionalism behaviors and attitudes were examined, a significant relationship between each 1-point difference in domain score and unprofessional behavior and attitudes was observed.

Strengths of the study include its multicenter design; inclusion of students attending diverse private and public medical schools geographically distributed across the United States; a sample of respondents representative of US medical students with respect to sex, relationship status, and parenting status; use of validated metrics to measure burnout, depressive symptoms, and QOL; and incorporation of measures of professionalism derived from the MSATU and the AMA Ethical Guidelines of Gifts to Physicians from Industry.

The results indicate that burnout was independently associated with report of unprofessional conduct and less altruistic professional values. In addition to exploring these associations further, future research should investigate whether interventions designed to reduce burnout help students cultivate professional values and behavior.

Author Contributions: Dr Dyrbye had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. 
Study concept and design: Dyrbye, Sloan, Shanafelt.
Acquisition of data: Dyrbye, Massie, Eacker, Harper, Power, Durning, Thomas, Moutier, Shanafelt.
Analysis and interpretation of data: Dyrbye, Durning, Moutier, Satele, Sloan, Shanafelt.
Drafting of the manuscript: Dyrbye, Durning, Shanafelt.
Critical revision of the manuscript for important intellectual content: Dyrbye, Massie, Eacker, Harper, Power, Durning, Thomas, Moutier, Satele, Sloan, Shanafelt.
Statistical analysis: Durning, Satele, Sloan.
Obtained funding: Dyrbye, Shanafelt.
Administrative, technical, or material support: Dyrbye, Power, Durning.
Study supervision: Dyrbye, Power, Shanafelt.
Financial Disclosures: None reported.

Online-Only Material: The eBox is available online at http://www.jama.com.

Funding/Support: This work was supported by a Professionalism Award from the Mayo Clinic; from the Mayo Clinic Department of Medicine, Division of Primary Care intramural funds; the Mayo Clinic Department of Medicine Program on Physician Well-being; and the Mayo Medical School Office of Educational Research.

Role of the Sponsor: The sponsors had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; or preparation, review, or approval of the manuscript.
PROFESSIONALISM AND BURNOUT IN MEDICAL STUDENTS

REFERENCES


©2010 American Medical Association. All rights reserved.