Role Modeling and Medical Error Disclosure: Results of a National Survey of Fourth-Year Medical Students

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Background: Medical students are in a formative stage of their professional development and their attitudes and behaviors regarding error disclosure may be influenced by their learning environment, a phenomena known as the “hidden curriculum”. We measured students’ exposure to negative and positive role modeling for responding to medical errors and examined the association between exposure to role modeling and students’ own attitudes and behaviors regarding error disclosure.

Methods: We administered an anonymous, electronic questionnaire to 1187 fourth-year medical students from seven medical schools representing all four regions of the U.S. The questionnaire asked respondents about: (1) personal experience with medical errors; (2) training for responding to errors; (3) nontransparent personal behavior in response to a harmful error (e.g., nondisclosure to supervising physicians or patients/families or evading responsibility); (4) frequency of exposure to role modeling related to disclosure as measured by a 2-item negative role modeling scale (e.g., observe more senior team member evade responsibility for error) (score range: 2-8, Cronbach α=.64) and a 3-item positive role modeling scale (e.g., observe more senior team member openly disclose error) (score range: 3-12, Cronbach α=.91); and (5) attitudes regarding disclosure as measured by a 9-item disclosure attitudes scale (score range: 9-36, Cronbach α=.74). Higher scores on these scales represent more frequent exposure to that type of role modeling and more positive attitudes regarding disclosure, respectively. Factor analysis was used to created summary variables representing scale items. Multivariate regression analysis was used to assess independent predictors of the two primary outcomes: (1) attitudes regarding disclosure and (2) nontransparent behavior in response to a harmful error.

Results: The overall response rate was 53% (631/1187). More than 80% of students reported exposure to positive role modeling for responding to errors; while more than 50% of students reported exposure to negative role modeling. Training for responding to errors had the largest independent, positive effect on attitudes regarding disclosure (standardized effect estimate, 0.32, P<.001); while negative role modeling had the largest independent, negative effect (standardized effect estimate, -0.24, P<.001). Positive role modeling had a similar, positive effect on attitudes (standardized effect estimate, 0.26, P<.001). Of the 11% (68/631) of students who reported contributing to a harmful error, 44% (30/68) reported nontransparent behavior in response to such an error. More frequent exposure to negative role modeling was independently associated with an increased likelihood of nontransparent behavior in response to a harmful error (OR 1.46, 95% CI 1.14 – 1.86; P<.001). While disclosure training and positive role modeling were associated with attitudes, they were not independently associated with behavior.

Conclusions: Exposure to role modeling predicts both students’ attitudes and behavior regarding the disclosure of harmful medical errors. Negative role models may be a significant impediment to disclosure among students. The findings suggest a “hidden curriculum” regarding error disclosure in which the behavior modeled by more senior team members may have a greater impact on subsequent trainee behavior than the values and expectations espoused by the educational and health care system.
The Role of Interns as Teachers: Interns’ and Medical Students’ Perceptions

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Background: Teaching is a vital skill of physicians and one that typically develops in residency. While published studies report that residents-as-teachers curricula improve teaching skills, none have described the unique role or needs of interns as teachers. The objective of this study was to explore the knowledge, attitudes, and reported teaching behaviors of interns who work with medical students and to assess medical students’ perceptions of their interns’ teaching behaviors in an environment where no formal interns-as-teacher curriculum exists.

Methods: In November 2012, the prior class (2011-2012) of categorical, medicine/pediatrics, preliminary and transitional interns at a university-based (N=66) and a community-based (N=18) internal medicine training program in Pittsburgh were surveyed electronically. Prior teaching experience and education, perceived comfort with and barriers to teaching, and reported teaching quality and frequency were assessed. Concurrently, a sample of 2011-2012 third-year medical students (MS3’s) who worked with these interns during their inpatient medicine clerkship (N=20) were surveyed to assess their perceptions of intern teaching quality and frequency, and perceived facilitators and barriers to teaching. Both surveys were anonymous. Descriptive statistics were performed for demographic items. Percentage correct was calculated for multiple choice knowledge-based items. Frequencies, means and standard deviations were calculated for attitudinal and skill items.

Results: Of those surveyed, 69% of former interns responded. Among them, 31% reported prior teaching experience and 29% prior training in teaching. The average percentage correct for knowledge items was 72%. A total of 74% felt interns play an important role in the education of MS3’s, but only 24% had confidence in their teaching ability, 22% were aware of their expectations as a teacher, and 21% felt well prepared to teach during their internship. Among the 80% of former MS3’s who responded, 81% felt interns play an important role in the education of third year medical students. Former MS3’s estimated that they spent an average of 25 hours per week interacting with interns during their medicine clerkship and that one-third of the clinical knowledge learned on that clerkship was taught by interns. The mean rating for teaching quality in 15 teaching scenarios was 3.1 (SD 0.8) by former interns and 3.1 (SD 0.7) by former MS3’s (5-point Likert-type scale where 1=poor, 3=average, and 5=excellent). The mean rating for teaching frequency of 22 teaching tasks ranged from 0.5 to 2.9 by former interns and 0.6 to 3.3 by former MS3’s (5-point scale where 0=never, 1=rarely/0-1 time(s) per week, 2=occasionally/2-6 times per week, 3=usually/once per day, and 4=all the time/more than once per day). Both former interns and medical students agreed on the following as the three greatest barriers to intern teaching: heavy workload, distractions, and stress.

Conclusions: Though former interns and MS3’s felt that interns play an important role in the education of medical students, most interns did not feel well-prepared to teach, lacked confidence in their teaching skills, and were unaware of their expectations as teachers. Therefore, curricula targeted specifically at developing the teaching skills of interns are needed.
"Am I cut out for this?” Understanding the experience of doubt among first year medical students

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Background: Research on medical student wellbeing shows high rates of distress, yet doubt as a distinct phenomenon remains poorly understood. The purpose of our study was to examine how first year medical students experience and respond to doubt, and how doubt relates to other aspects of student distress.

Methods: We conducted a mixed methods study involving a survey and focus groups examining the phenomenon of doubt among first year medical students at the Johns Hopkins University School of Medicine (JHUSOM). Students were asked to answer 14 questions about doubt embedded in an online advising program survey in June, 2012. Doubt survey items were developed and revised based on literature review, and included four questions from a validated wellbeing index. Results were analyzed by grouping students into categories of high, moderate, low, or no doubt. For each doubt item, logistic regression was used to compare the proportion of students who “agreed” among moderate/high doubters vs low/no doubters. For wellbeing questions, total doubt scores and total wellbeing scores were correlated with Spearman’s rho. In addition, four 90-minute focus groups were conducted with a convenience sample of students in June-July, 2012. Focus group questions were written by the authors, then pilot-tested and revised prior to use. Digital recordings were transcribed, independently coded, and iteratively reviewed by the authors to identify major themes.

Results: 114/119 (96%) students completed the survey. 20% had high doubt, 29% moderate doubt, 22% low doubt, and 29% no doubt. Compared to those with low/no doubt, students with moderate/high doubt were 5 to 13 times as likely to question their personal purpose, to question who they were, to struggle with coping with doubt, and to perceive the JHUSOM climate as discouraging them from expressing doubt. There was moderate correlation between total doubt and wellbeing scores (spearman’s rho = 0.36). 34 students participated in the focus groups. Three major themes were identified: types of doubt, ways of coping with doubt, and impact of doubt. Types of doubt were related to two main questions:

- Do I want to become a doctor? Subtheme example: the opportunity cost of pursuing medicine
- Am I capable of becoming a doctor? Subtheme example: concerns about one’s ability to succeed and maintain work-life balance

Ways of coping with doubt included:

- Relying on supportive relationships
- Maintaining perspective through a focus on long-term goals

The impact of doubt included positive and negative aspects:

- Positive examples: motivation and resilience in the face of uncertainty
- Negative examples: burnout, stress, and poor academic performance

Conclusions: Doubt is prevalent among first-year medical students, affecting students’ sense of confidence, identity, and purpose, and has both positive and negative consequences. Students also experience other forms of distress, which may be related to doubt. Doubt among medical students merits awareness and further study, as it may be an important mediator of students’ emerging sense of identity and personal wellbeing.
Learning environment assessment of one curriculum being taught at medical schools 10,000 miles apart

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Background: American academic medical centers are expanding their international activities, including those in medical education. Creating an effective learning environment is critical for success in medical education but this may be difficult when cultures collide. Johns Hopkins Medicine is currently building Perdana University Graduate School of Medicine (PUGSOM) near Kuala Lumpur, Malaysia, making PUGSOM the third American medical school situated beyond our borders. In the fall of 2011, the first class of PUGSOM students matriculated. The goal of this study was to compare students’ assessment of the learning environment at PUGSOM to that at Johns Hopkins University School of Medicine (JHUSOM), where the curriculum was created and from which most PUGSOM faculty came. A secondary goal of the study was to assess a new learning environment assessment tool, the Johns Hopkins Learning Environment Scale (JHLES), in another context.

Methods: Students responded anonymously to online surveys during the summer after their first year of medical school. Surveys contained demographic questions and 2 learning environment scales, the Dundee Ready Educational Environment Measure (DREEM) and the JHLES. The DREEM is the most widely used survey to assess the learning environment; students respond across a 5-point Likert scale with their level of agreement with 50 items, grouped into 5 categories: (1) perception of teachers, (2) perception of teaching, (3) academic self-perception, (4) perception of atmosphere, and (5) social self-perception. DREEM scores range from 0-200, and in prior studies, often average ~125. The JHLES is a 28-item survey, also using 5-point Likert scale response options developed at JHUSOM. Factor analysis resulted in 7 domains: (1) community of peers, (2) faculty relationships, (3) academic climate, (4) engagement, (5) mentorship, (6) acceptance and safety, and (7) physical space. Potential scores on JHLES can range from 28-140.

Results: Complete surveys were collected from 100/120 (83%) students at JHUSOM, and 24/24 (100%) at PUGSOM. A greater proportion of PUGSOM respondents were female (71% vs. 50%), but gender did not influence scores on learning environment scales in subgroup analyses. The quality of the learning environment was perceived to be better at PUGSOM than JHUSOM on scores on the DREEM (155 (SD 19) vs. 143 (SD 23), p=0.011) and JHLES (117 (SD 12) vs. 112 (SD 12), p=0.078). Statistically significant differences (p<0.05) between JHUSOM and PUGSOM student responses occurred on 17/50 individual items on the DREEM. PUGSOM students gave more favorable ratings on 13 of these 17 items, including 8 in the “perception of teaching” category. On JHLES, responses differed significantly for 6/28 items: 5 of these 6 had PUGSOM students providing more favorable ratings. Correlation coefficients for scores on the DREEM and JHLES were r=0.80 for PUGSOM and r=0.64 for JHUSOM.

Conclusions: The DREEM and JHLES were highly correlated in both settings and indicated that the learning environments at PUGSOM and JHUSOM are positive. The high appreciation of the learning environment at PUGSOM, where an American curriculum has been introduced by American faculty, should reassure that high quality education can translate across countries and cultures. Future work will be needed to determine if the quality of the learning environment is maintained over time and how it relates to educational outcomes such as exam scores, residency placement, and quality of patient care.
The Impact of Limited Team Continuity on Medical Students: A survey-based evaluation of team fragmentation’s effects on third-year medical students during their inpatient internal medicine clerkship.

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Background: As programs adapt to new resident duty hour changes implemented in July 2011, internal medicine resident work schedules have progressively transitioned toward shift-based systems, often resulting in increased team fragmentation. We hypothesized that exposure to shift-based schedules that result in such team fragmentation would have a negative effect on medical student experiences during their required third-year internal medicine clerkship.

Methods: As part of a larger national study on the impact of duty hour reform on medical students, 67 of 150 eligible third-year medical students completed surveys about career choice, teaching and supervision, assessment, patient care, well-being, and attractiveness of an internal medicine career after completing their internal medicine clerkship. Non-demographic variables used a 5-point Likert scale from strongly disagree to strongly agree. We assessed the impact of exposure to shift-based schedules on student perceptions of these variables. Chi-squared and Fisher’s exact tests were used to assess relationships between exposure to shift-based schedules and student responses. Questions with univariate p<0.1 were included in multivariable logistic regression models.

Results: Of the 67 students, 37 (54%), were exposed to shift-based schedules. Overall satisfaction with the clerkship was high (>90%) as was expressed interest in a career in internal medicine or a combined specialty with internal medicine (66%) and these variables did not vary by exposure. Exposed students were less likely to agree or strongly agree that their attendings were committed to teaching (88% vs. 100%, OR 0.35, 95% CI 0.13-0.90). There was no difference between groups in perceived time to teach by attendings, residents or interns, nor did perceived commitment to teaching vary for residents or interns. However, exposed students were more likely to agree or strongly agree that interns were able to observe them at the bedside (79.4% vs. 58.1%, OR 1.89, 95% CI 1.08-3.13) and had sufficient exposure to assess their performance (97.1% vs. 80.7%, OR 3.00, 95% CI 1.01-8.86), whereas they were less likely to strongly agree or agree that residents had sufficient exposure to assess their performance (88.3% vs. 90.3% OR 0.29, 95% CI 0.09-0.91). Finally, although not statistically significant, there was a trend towards students feeling less team support in the exposed group (OR 0.51, 95% CI 0.24-1.11).

Conclusions: Medical student exposure to shift-based schedules with rotating residents had little effect on their perceptions of residents as teachers or their overall satisfaction with their rotation, and seemed to increase the importance of interns in student assessment. However, such exposure appears to adversely affect the relationship between medical students and attending physicians by significantly decreasing attendings’ perceived commitment to teaching. It also impacted perceived ability of residents to be able to assess student performance. Moreover, there was a trend toward reduced feeling of team support. These findings suggest that team continuity may have important broader implications for the teaching environment and should be an important consideration when implementing shift-based schedules. The larger study may help further inform these results.
A National Assessment on Patient Safety Education in Undergraduate Medical Education: A Survey of Clerkship Directors in Internal Medicine

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Background: Patient safety is an important aspect of quality patient care. For this reason, accreditation bodies emphasize educating learners on patient safety in both undergraduate and graduate medical education curricula. This study looks at the current status of patient safety curricula from the perspectives of internal medicine clerkship directors. In addition, this study compares the current status to what was found in a similar study from 2006¹.

Methods: The patient safety survey was a part of the Clerkship Directors in Internal Medicine (CDIM) 2012 annual survey. Questions were identified based on literature review, then modified and edited by the CDIM research committee. 37 patient safety related questions were organized into sections including general information, curriculum content and delivery, learner assessment, and barriers to providing the curriculum. All analysis was done using SPSS with group difference tested with Chi-squares for nominal variables. IRB approval was obtained.

Results: Of the 121 clerkship directors surveyed 99 (82%) responded. Of those responding 45.6% (n=41) describe having patient safety curriculum at some point during the four years of medical school curriculum. Patient safety curriculum was commonly taught in the third year (30.3%) of medical school followed by the pre-clinical years (yr1=19.2%, yr2= 28.3%). The top three content areas included in the curriculum were infection control (54.1%), handoffs and sign outs (47.4%), and medication safety (39.5%). Small groups (42.4%) followed by lectures (31.3%), direct observation (30.3%) and Morbidity and Mortality reports (28.3%) were used as educational strategies. Even though strategies such as patient safety project, simulations and OSCE were used for assessment of the curricula, only 20% of the respondents reported satisfaction with student safety competency assessment during their IM clerkship. Lack of a mandate from their school’s dean’s office (38%), lack of physician champions (43.7%), lack of trained faculty (65.3%), and lack of time (78.1%) were cited as barriers to implementation. Schools with female clerkship directors were significantly more likely to have a patient safety curriculum compared to schools with male clerkship directors (p=0.01).

Conclusions: Less than half of medical school curricula report having patient safety curricula. Even though clerkship directors recognize the importance of teaching patient safety curriculum, barriers exist to implementing the curricula. National guidelines on patient safety curriculum are currently not enough and more needs to be done to bring about the desired changes.