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Exposure to Death is Associated with Positive Attitudes and Higher Knowledge About End-of-Life Care in Graduating Medical Students

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Abstract

Objective: To examine the relationship between exposure to death and attitudes and knowledge about end-of-life care in graduating medical students.
Participants and methods: Survey of students graduating from the University of Pittsburgh School of Medicine between 2001 and 2006. Students reported their personal experience with death and their exposure to death and dying patients during medical school. They rated their agreement, on a 4-point Likert scale, with 8 attitude items that were previously used in a national survey. Knowledge about end-of-life care was assessed with a 15-item test about pain and symptom management, ethics, treatment appropriateness, and hospice.
Results: Three hundred and eighty students completed the survey; the response rate was 47%. Seventy-six percent of students reported personal experience with death, and 73% reported caring for dying patients or witnessing a patient's death during their third-year clerkships. Students had positive attitudes about physicians' responsibility and ability to help dying patients and their families, but reported negative emotional reactions to end-of-life care. Students who reported personal or professional experience with death had more positive attitudes and higher knowledge scores than those who did not, $p < 0.05$.
Conclusions: Educational initiatives should maximize the time medical students spend caring for dying patients. Teaching students end-of-life care during the course of their clinical clerkships is an effective way to improve attitudes about end-of-life care. Schools should focus on developing emotionally supportive settings in which to teach students about death and dying.

Introduction

Improving end-of-life care is a national priority, and inadequate training of health personnel is a key barrier.[1,2] Efforts to improve undergraduate medical education in end-of-life care have mounted at the national level and within medical schools. To be accredited, U.S. and Canadian medical schools must provide end-of-life care instruction.[3] Objectives for medical student education in end-of-life care have been established and validated, and methods for integrating these objectives into medical school curricula have been developed.[4–12] Many schools have published reports of their curricular changes to improve end-of-life care education.[13–23] These changes are well accepted by students, and many have been shown to improve students' confidence, attitudes, and knowledge about end-of-life care.[24–30]

Despite these efforts, significant deficiencies remain. Medical students feel it is important that they learn to care for dying patients, and value end-of-life care education when they do receive it.[31–33] However, at the end of medical school most state that their end-of-life care education has been inadequate and as a result feel unprepared to care for dying patients.[32–36] Medical schools vary dramatically in the amount and type of end-of-life care instruction students receive.[13–23,31] In particular, there is significant variation in students' clinical exposure to death and dying patients. National Consensus Recommendations underscore the importance of students being exposed to dying patients,[10] and survey studies indicate that students who have clinical end-of-life care experience feel more prepared to discuss end-of-life issues and treat common symptoms.[33,34] However, required end-of-life care instruction at most medical

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schools is limited to didactic sessions in the preclerkship years; clinical experiences are often elective.[14,31,35] As a result, many students leave medical school without exposure to death or dying patients.[1,35] We sought to empirically evaluate the association between exposure to death and medical students' attitudes and knowledge about end-of-life care. We hypothesized that students who were exposed to death, either in their personal lives or during medical school, would have more positive attitudes and greater knowledge about end-of-life care.

Methods

Study setting and participants

We surveyed medical students who graduated from the University of Pittsburgh School of Medicine between 2001 and 2006. Students were notified of the study by e-mail in the month before graduation and completed the survey online. Students in the classes of 2005 and 2006 completed a similar survey during their first month of medical school, so paired pre-medical and post-medical school data were available for these students. The Institutional Review Board at the University of Pittsburgh approved the survey protocol, with the requirement that students read a description of the study and consent before completing the survey.

End-of-life care education during the survey period

We are in the process of introducing an integrated end-of-life curriculum at the University of Pittsburgh School of Medicine, aimed at effecting cultural change at the institutional level.[11,22,37,38] There is a well-established hospital-based palliative care consultation service at the University of Pittsburgh Medical Center, where University of Pittsburgh medical students complete their clinical rotations.[39,40] Palliative care attendings actively involve students who are doing their clerkships on consulting services in their consultation process. In doing this, they provide clinical instruction in end-of-life care by serving as role models and suggesting professional literature on topics such as pain and symptom management, communication of bad news, advance care planning, psychological and spiritual support, and conducting a family meeting. An average of nine fourth-year students also rotate on the service each year as a 1-month elective. Prior to 2006, formal teaching about end-of-life issues in the preclerkship curriculum was limited to 3 hours of lecture in a first-year medical ethics course. Beginning with the class of 2006, changes were made to the preclinical curriculum: end-of-life care learning objectives and content were introduced into existing first- and second-year courses through new lectures and panel presentations by patients, physicians, and families; and problem-based learning cases accompanying organ-based teaching incorporated instruction about topics such as the use of opiates to palliate dyspnea.

Measures

We assessed the following measures of students' exposure to death: (1) personal experience with death (loss of a close friend or family member), (2) whether they cared for dying patients or witnessed a patients' death during their third-year clerkships, (3) how many dying patients they cared for during their third year, (4) how many deaths they witnessed during their third year, and (5) how many dying patients they helped care for over the course of medical school. Attitudes about end-of-life care were assessed by asking students to rate their agreement, on a 4-point Likert scale, with 8 statements[41] that were used in a national survey of students, residents, and faculty.[35] Knowledge was assessed using 15 (11 multiple guess and 4 true-false) questions about pain and symptom management, ethics, and appropriateness of treatments at the end-of-life.[41] Student age, gender, ethnicity, race, and planned specialty were also collected. The survey that students in the classes of 2005 and 2006 completed during their first month of medical school contained the same attitude and knowledge questions as the graduation survey, so that changes in attitudes and knowledge could be measured over the course of medical school. To assess students' interest in end-of-life care, students were asked on the entrance survey to rate, given their own personal interests or career goals, the importance of learning to care for dying patients.

Analysis

Responses to attitude items were collapsed into agree and disagree. Factor analysis revealed no coherent grouping of the attitude responses, so each was analyzed individually as a dichotomous variable. Each student's 15-item knowledge test was scored and the percent of all items answered correctly was used as the knowledge outcome, treated as a continuous variable. For the classes with paired data (2005 and 2006), we calculated the change in attitudes and knowledge over the course of medical school by student. Discrete variables were summarized with frequencies, and continuous variables were summarized with measures of central tendency and variability.

Prior to performing measures of association, we converted continuous variables describing exposure to death into discrete variables, because the distribution of these variables was very skewed. The cut points were set based on groupings within each variable's distribution. Relationships between exposure to death, attitudes, knowledge, and sociodemographic factors were assessed using two-tailed *t*-tests for continuous variables (knowledge and age, which were normally distributed), the Pearson χ^2 test for discrete variables, and Fisher exact test if appropriate. We tested for differences in attitudes and knowledge between the graduating classes (2001–2006) to assess the effect of changes in the end-of-life care curriculum over the survey period. We did not perform a multivariate analysis because no sociodemographic variables were associated with both the predictor (exposure to death) and outcome (attitudes and knowledge) variables in univariate analyses. To determine whether experience with death related to student interest in end-of-life care, we analyzed the association between the importance of learning to care for dying patients from the entering student survey (for classes of 2005 and 2006) and personal exposure to death and exposure to death and dying patients during medical school. To assess for selection bias, we compared entrance survey responses between students in the classes of 2005 and 2006 who did and did not respond to the graduation survey. We considered a p value < 0.05 to indicate a statistically significant association and a p value < 0.1 to indicate a trend toward association. SPSS was used for all statistical analyses (SPSS Inc., Chicago, IL).

TABLE 1. SOCIODEMOGRAPHIC CHARACTERISTICS OF PARTICIPATING STUDENTS

Characteristic	n = *380*
Age,[a] mean years (SD)	28 (3)
Gender,[a] % female	57
Ethnicity,[b] % Hispanic	3
Race,[c] %	
Caucasian	74
Asian	20
African American	6
Other	0
Planned specialty,[d] %	
Primary care	32
Medical or pediatric specialty	11
Surgical	31
Psychiatry	8
Other	18

[a]Age and gender only collected 2004–2006, $n = 148$.
[b]Ethnicity only collected 2002–2006, $n = 281$.
[c]Race only collected 2002–2006, $n = 263$.
[d]Planned specialty $n = 376$ due to missing data.

Results

Student characteristics

We surveyed a total of 380 graduating students. Our response rate was 47%. Both entering and graduating surveys were available for 50 students in the class of 2005 and 25 students in the class of 2006. The students' mean age was 28 years, a little over half were women, and most were Caucasian (Table 1). They described their planned specialty as: primary care (32%), medical or pediatric subspecialty (11%), surgical (31%), psychiatry (8%), and other (18%). Of the students in the classes of 2005 and 2006 who were surveyed when they entered medical school, 72% reported that it was very important that they learn to care for dying patients. We only identified one difference in the entry survey responses between students in the classes of 2005–2006 who completed the entrance and graduation surveys and those who only competed the entrance survey: female students in the classes of 2005-2006 who completed the entrance survey were more likely than male students to also complete the graduation survey, (37% versus 25%, $p = 0.05$).

Exposure to death

Seventy-one percent of graduating students reported personal experience with death, and 73% reported caring for dying patients or witnessing a patient's death during their third-year clerkships (Table 2). During their third-year clerkships, students cared for a median of 2 dying patients (range, 0–20) and witnessing a median of 1 death (range, 0–20). Over the course of medical school, they helped care for a mean of 3 (range, 0–20) dying patients. In the students in the classes of 2005 and 2006 for whom paired data were available, we found no association between their interest in learning to

TABLE 2. ATTITUDES OF GRADUATING MEDICAL STUDENTS BY EXPERIENCE WITH DEATH

	Students who agree, %						
	All	*Personal experience with death*			*Cared for dying patients in third year*[a]		
Attitudes	n = *380*	*No* n = *109*	*Yes* n = *271*	p[b]	*No* n = *39*	*Yes* n = *104*	p[b]
Psychological suffering can be as severe as physical suffering.	98	97	99	0.4	97	98	0.8
Physicians have a responsibility to help patients at the end of life prepare for death.[c]	97	92	99	0.002	92	100	0.004
Depression is treatable among patients with terminal illnesses.	96	94	97	0.2	95	97	0.5
Physicians have a responsibility to provide bereavement care to the patient's family members after death.	89	86	90	0.2	95	89	0.3
It is possible to tell patients the truth about a terminal prognosis and still maintain hope.	86	83	88	0.2	77	89	0.06
Caring for dying patients is depressing.	49	56	46	0.08	56	45	0.2
I feel guilty after a patient's death.	28	34	26	0.1	44	21	0.007
I deread having to deal with the emotional distress of family members of a patient at the end of life.	24	35	19	0.001	39	21	0.04

[a]Only administered on graduating surveys for classes of 2004–2006; total $n = 143$.
[b]From χ^2 test tests comparing students who were and were not exposed to death.
[c]This item was not administered to the graduating class in 2005; total $n = 281$.

care for dying patients on the medical school entrance survey and whether they cared for dying patients or witnessed a patients' death during their third-year clerkships.

Attitudes about end-of-life care

Although almost all students held positive attitudes about physicians' responsibility and ability to care for dying patients and their families, a significant percent reported negative emotional reactions to end-of-life care (Table 2). In the paired analysis of the students in the 2005 and 2006 classes, we observed that students with positive attitudes at medical school entry retained them over the course of medical school, and that students with negative attitudes at entry had more positive attitudes at graduation. For example, on the entrance survey, 69% of students did not dread the emotional distress of family members. Of these students, 91% continued not to dread it at graduation, compared with 9% who began to dread it over the course of medical school. Of the 41% of students who dreaded family members' distress at medical school entry, 61% no longer dreaded it at graduation, compared with 39% who did ($p = 0.002$ comparing all 4 contingencies). We found no association between attitudes and graduating class year (2001–2006) in either the paired or unpaired analysis.

Knowledge about end-of-life care

The graduating students scored a mean percent correct of 79% (standard deviation [SD] = 12) on the knowledge test. In the paired analysis of students in the classes of 2005 and 2006, students' knowledge scores increased over the course of medical school. The mean knowledge test score was 56% (SD = 12) for entering students and 82% (SD = 10) for graduating students, $p = 0.01$. The mean increase in percentage points per student over the course of medical school was 27 (SD = 13). We found no association between knowledge and graduating class year (2001–2006) in either the paired or unpaired analysis.

Relationship between exposure to death and attitudes and knowledge

Table 2 compares students' agreement with the attitude items based on whether or not they reported personal exposure to death and exposure to death during medical school. Students who reported personal or professional experience with death were more likely to have positive attitudes about physicians' responsibility and ability to care for dying patients and their families, and were less likely to report negative emotional reactions to end-of-life care. In further analysis, we observed a dose effect between exposure to dying patients and attitudes and knowledge. Of students who reported caring for 0 dying patients during their third-year clerkships, 67% agreed that physicians have a responsibility to provide bereavement care to patients' family members after death, compared to 85% of students who cared for 1–2 dying patients and 94% of students who cared for 3 or more dying patients, $p = 0.04$. Of students who cared for 0 dying patients, 89% agreed that psychological suffering can be as severe as physical suffering, compared to 98% of students who cared for 1–2 dying patients and 100% of students who cared for 3 or more dying patients, $p = 0.07$. Of students who did not witness a patient's death, 36% reported feeling guilty after a patient's death compared with 16% of students who witnessed 1 death and 15% of students who witnessed 2 or more deaths, $p = 0.05$. The total number of dying patients students helped care for over the course of medical school was associated with their score on the knowledge test. Graduating students who did not help care for any dying patients over the course of medical school ($n = 52$) scored a mean of 76% correct (SD = 14) on the knowledge test, while students who helped cared for 1–4 patients ($n = 231$) scored 79% (SD = 12), and those who helped care for 5 or more patients ($n = 91$) scored 82% (SD = 12), $p = 0.01$.

Discussion

We analyzed survey data from 380 graduating medical students to examine the relationship between exposure to death and attitudes and knowledge about end-of-life care. Most students reported both personal experience with death and experience with death and dying patients during medical school. Students had positive attitudes about physicians' responsibility and ability to help dying patients and their families, but reported negative emotional reactions to end-of-life care. In the classes of 2005–2006, for which pre-/post-medical school data was available, we found that students' attitudes toward end-of-life care became more positive and their knowledge about end-of-life care increased over the course of medical school. Both personal experience with death and exposure to death during medical school were associated with more positive attitudes and higher knowledge about end-of-life care.

Our findings are interesting in the context of two important concerns raised in the literature about undergraduate end-of-life care education. First, reports and national surveys raise concern that students are sheltered from death and dying patients, and as a result may leave medical school without being involved in the care of dying patients.[1,35] Although most of our students cared for at least 1 dying patient or witnessed at least 1 death during their third-year clerkships, 27% of students cared for no dying patients, and there was marked variability in the numbers of dying patients for whom students cared. Second, past studies describe a hidden or informal curriculum during which students undergo an acculturation process in medical school where they learn negative attitudes about end-of-life care from their supervising residents and faculty.[11,22,37,38] This did not seem to be the case for the students in our survey, who acquired positive attitudes and knowledge about end-of-life care over the course of medical school.

That exposure to death was associated with more positive attitudes and higher knowledge provides empiric evidence to guide end-of-life care curriculum development. First, the association supports the recommendation that clinical care of dying patients should be a required part of every medical school curriculum.[10,42] Second, that exposure to death and dying patients during the third year of medical school was associated with positive attitudes indicates that effective end-of-life care education can be provided by integrating end-of-life care education into existing courses and rotations. This approach is much more feasible than creating new courses and rotations given the limited time that is available in medical school curricula.[43] That knowledge about end-of-

life care was associated with the total number of dying patients students helped care for over the course of medical school but not with their exposure to death and dying patients during their third year indicates that some students learned about end-of-life care in the context of caring for dying patients during a fourth-year elective or other setting. Based on this result, it seems that a more intensive exposure to death is required to impact knowledge. This finding, along with the variability in the number of dying patients for which students cared, underscores the importance of curricular efforts to ensure that all students care for dying patients.

The fact that students reported negative emotional reactions to care of dying patients and their families is also an important consideration for curriculum development. Our results mirror the findings of a national sample of medical students, residents, and faculty,[35] and indicate that lack of emotional coping skills is a significant barrier to comfort with end-of-life care. Physicians and students alike have emotional reactions to patients' deaths,[44–50] and physicians who do not learn coping skills are at risk for stress and burnout.[51,52] Experiencing death in a supportive environment is an opportunity for students to learn emotional coping skills that become healthy habits for the rest of their careers.[45,53] However, studies to date indicate that students do not feel supported when their patients die, and as a result do not learn how to relate with their own emotions.[45–50,54] Future work should explore ways to teach students about death and dying in emotionally supportive settings.

In interpreting our findings, it is important to consider the effect of the strong hospital-based consultation service at the University of Pittsburgh Medical Center.[39,40] A central goal of the Palliative Care Program has been to address the informal/hidden curriculum at the institution. Students interact with palliative care consult faculty during their third-year clerkships and learn from residents who have been influenced by the service. Thus, our results may not be generalizable to settings in which students are not exposed to a palliative care program.[10,33,35]

Our study has several limitations. First, our response rate was only 47%, and we do not have data on the students who did not respond. Thus, our results may include a selection bias if the students who responded to the survey were systematically different from those who did not. We only had paired pre-/post-medical school data for two of the six classes included in our analysis. In the paired analysis of the classes of 2005 and 2006, exposure to death during medical school was not associated with student interest in learning about end-of-life care at medical school entry. However, it is possible that an unmeasured confounding variable was associated both with students' exposure to death and their knowledge and attitudes. Second, although the instrument we used to assess attitudes and knowledge was developed for fourth-year medical students, it has not been validated and data are not available to compare students' performance on the knowledge items to other cohorts. Third, we used students' report to measure personal and professional exposure to death, so it is possible that a recall bias affected our results. It is also unclear where students were exposed to death outside of their third-year clerkships, as our dataset did not include information about students' participation in fourth-year electives. Only an average of 9 students participated in the fourth-year palliative care elective each year, indicating that students participated in other electives where they learned to care for dying patients, e.g., in the intensive care unit or oncology service. Finally, the outcomes we used to assess student's preparation to provide end-of-life care were attitudes and knowledge. These outcomes are necessary but not sufficient for students to provide quality end-of-life care. A skills-based assessment such as watching students interview and make clinical decisions about a real or standardized patient in an Objective Structured Clinical Examination setting would provide a more accurate reflection of students' ability.

In summary, our finding that exposure to death is associated with positive attitudes and greater knowledge about end-of-life care in graduating medical students supports the recommendation that all students should participate in the clinical care of dying patients. Teaching students end-of-life care during the course of their clinical clerkships is an effective way to improve attitudes about end-of-life care. Negative emotional responses to end-of-life care may be significant barriers, so schools should focus on developing emotionally supportive settings in which to teach students about death and dying.

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Author Disclosure Statement

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