RESEARCH ARTICLE

A biopsychosocial approach to death, dying, and bereavement: a course on end-of-life education for medical students [version 4; peer review: 1 approved, 3 approved with reservations, 1 not approved]

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Abstract

Background: Despite the inevitable nature of death and dying, the conversations surrounding this subject are still uncomfortable for many physicians and medical students.

Methods: A six-week humanities-based course, “A Biopsychosocial Approach to Death, Dying, & Bereavement,” at Cooper Medical School of Rowan University, United States, which covers definitions of death and dying, the process of dying, ethical dilemmas, and new concepts of the grieving process. Through development of a curriculum using various academic and medical literature and resources, we sought to bring attention to the necessity of having a medical education curriculum on death and dying to prepare medical students for the difficult conversations and patient experiences that lie ahead of them. Qualitative data in the form of surveys and reflection papers submitted by students and quantitative data (Likert scores on course satisfaction) were collected and analyzed both pre- and post-course.

Results: 90.7% (49/54) of the respondents answered that they agree or strongly agree with the statement that this selective course was useful in the student’s medical education experience. The top three qualitative themes brought up the most in reflection papers (n=54) were: the utility and instruction of the course (21 times), the importance of hospice and palliative care (20 times), avoidance around topics of death (15 times).

Conclusions: Medical students are often not prepared to cope with the realities of patient loss and of caring for the patient and their family.
families throughout the dying process. We created this course to familiarize medical students with an aspect of the medical experience that is frequently neglected in traditional medical curricula. We learned that integrating such a course can help educate medical students facilitate important conversations, teach them to act with kindness and dignity in a physician-patient setting, and enhance their personal understanding of death and dying.

**Keywords**
medical education, end-of-life care, death, dying, bereavement
Amendments from Version 3

We appreciate the reviewer’s assessment of the topic and its appropriateness in medical education. We added greater clarity to the Methods section and hope this addresses the reviewer’s concerns. In addition, we thought it best to eliminate Table 2, based on the reviewer’s comments. We also restructured the second table and organized the thematic content under “provider-centric” and “patient-centric” comments. Lastly, we agree that COVID-19 has had significant, perhaps as yet uncharacterized impacts on our students and residents. We added this to our “Limitations” section. We hope that these revisions are acceptable but would be happy to further adapt the manuscript at your discretion.

Any further responses from the reviewers can be found at the end of the article.

Introduction

Death is infrequently acknowledged in the field of medicine but is an experience that all medical students will encounter in some capacity as residents and practicing physicians. Despite the inevitable nature of death and dying, the conversations surrounding this subject are still uncomfortable for many physicians and medical students. Past studies have shown that many medical students believe that they are not adequately exposed to topics on death, dying, and end-of-life care. Though initiating discussions about death and appropriately supporting the patient and family is an integral part of the physicians’ careers, many students feel that it is one of the things that medical education least prepares them for. While students are taught how to reach successful medical diagnoses and are educated on the physical setting in which it is best to deliver bad news to the patient and their family, this is only a superficial, though necessary, component to patient communication. Students would benefit from greater exposure and experience in supporting patients and families with empathy. By preparing future physicians with useful skills such as learning how to cope with grief and loss, we will be able to cultivate empathy and build resilience among future physicians.

Patients prefer receiving death in a “human-oriented approach,” full of empathy and understanding, rather than the typical “organ-oriented” and “disease-oriented” diagnosis with which the medical community is more familiar. A survey of medical hematology and oncology fellowship directors reported 89% of program directors felt they themselves received nearly no formal training in the delivery of bad news and, out of the current fellows, 77% stated that they received some or nearly no training. Additionally, 63% of these program directors felt that medical schools should provide more foundational training in the subject. Providing future physicians with opportunities to receive and practice proper education and training in death and dying will help them better cope with the death of their patients and equip them with resources on how to openly talk about death, dying, and end of life care. With additional support embedded in medical education, students can prepare themselves to take care of their own emotional well-being while navigating the death of patients they directly care for. Patients who are facing the end of their life may feel more comforted by these future physicians, who will have more knowledge and education behind death and dying. This can directly lead to supporting and guiding patients dealing with uncertainty and hardship in a more sincere and humanistic manner.

Medical education plays a pivotal role in delivering these skills to future physicians. Providing student doctors with the opportunity to engage in targeted practice on strategies for handling tough conversations with patients, while maintaining professionalism, mental balance, and emotional detachment, is ideal. Our course, “A Biopsychosocial Approach to Death, Dying, & Bereavement,” was developed at Cooper Medical School of Rowan University, United States. It exposes students to thanatology and defines death from the various dimensions of human development. The course discusses definitions of death and dying, the process of dying, related ethical dilemmas, and new concepts of the grieving process. Ultimately, we identified the need for such training in the medical curriculum and created a course to help facilitate these conversations and act with kindness and dignity when doing so (see Extended data).

Ethics

This study was deemed to be exempt status per the Rowan University Institutional Review Board (IRB). Because this project is for medical education and utilizes primarily qualitative data from deidentified students who enrolled in the course, Rowan IRB has determined that this project is in the exempt category. Upon enrollment of the course, students were informed that the data collected in the course would be used to enhance medical education. IRB and the Office of Medical Education deemed that no written consent would be required because the data was collected as part of normal educational activities and deidentified during analysis by OME. Much of the institution’s curriculum is novel and routine assessment of curricular elements is considered quality improvement by Rowan IRB.

Methods

Cooper Medical School of Rowan University offers sessions to pre-clinical medical students called the Selectives in the Medical Humanities. The Selectives cover a wide array of topics from ethics and fine arts to improvisation and dance to narrative medicine and storytelling. Six to eight Selectives are offered each semester and students participate in a lottery with ranked preferences to determine enrollment. They consist of six two-hour sessions over the course of both the Fall and Spring semesters. First and second year students must select two semesters to take these humanities courses which are structured as small groups. Our course focused on expanding students’ knowledge of concepts and issues surrounding the process of death, dying, and bereavement with a goal to improve the doctor-patient relationship and personal understanding. Prior to the start of the course, students received the syllabus (see Extended data), which highlighted the overview, goals, objectives, expectations, and course outline. In preparation for the course, five articles were required to be read before each session (see Extended data). The book titled In the Face of Death: Professionals Who Care for the Dying and the Bereaved was used to supplement the respective sessions.
The six weekly lectures were thematically arranged. The topics covered were “The Caring Relationship,” “The Care Provider in Death Situations,” “Hospice Care,” “The Team in the Face of Death,” “Managing Sources of Stress,” and “Motivations & Rewards; Reflections on Living & Dying” (Table 1). Small group discussion was facilitated by a lead instructor (author)

### Table 1. Course breakdown.

| Week | Topic | Learning outcomes | Performance indicators of learning |
|------|-------|-------------------|-----------------------------------|
| 1    | The caring relationship | Distinguish between various models for the caring relationship (i.e., medical, biopsychosocial, holistic, palliative) | Read Section I: “The Caring Relationship” found in *In the Face of Death: Professionals Who Care*  
Discuss reactions to these readings during class meeting |
|      |       | Describe the impact of the relationship between society, science, and death | |
|      |       | Identify features of the Helping Relationship between the dying or grieving and the physician | |
| 2    | The care provider in death situations | Develop awareness of one's own personal responses to death and be able to identify grief complications experienced by physicians | Draper, Emma, *et al.* (2019) “Relationship between Physician's Death Anxiety and Medical Communication and Decision-Making: A systematic review,” *Patient Education and Counseling*, 102:266–274  
Discuss reactions to these readings during class meeting |
|      |       | Read Section II: “The Care Provider in Death Situations” found in *In the Face of Death: Professionals Who Care*  
Brighton, Lisa Jane, *et al.* (2019) “Emotional Labour in Palliative and End-of-Life Care Communication: A Qualitative Study with Generalist Palliative Care Providers,” *Patient Education and Counseling*, 102: 494–502  
Discuss reactions to these readings during class meeting |
|      |       | Know what is meant by the concept of the wounded healer; be able to identify signs of compassion fatigue, burnout, and vicarious traumatization | |
|      |       | Distinguish between the focus/treatment found in hospice versus hospital care | |
| 3    | Hospice care | Develop awareness of Hospice Care (i.e., history of the hospice movement, nature of the work, approach to end of life care, palliative care) | |
|      |       | Know what is meant by the concept of the wounded healer; be able to identify signs of compassion fatigue, burnout, and vicarious traumatization | |
|      |       | Distinguish between the focus/treatment found in hospice versus hospital care | |
| 4    | The team in the face of death | Describe ways to manage difficult patients and families, deal with pressures of work and manage impact of work stressors on staff | Ekberg, Stuart, *et al.* (2019) “Discussing Death: Making End of Life Implicit or Explicit in Paediatric Palliative Care Consultations,” *Patient Education and Counseling*, 102: 198–206  
Discuss reactions to these readings during class meeting |
|      |       | Describe ethical issues that arise with dying patients and grieving families | |
|      |       | Identify way of coping with stressors | |
| 5    | Managing sources of stress | Identify the features of optimal team functioning in death situations at a systemic level | Read Section III: “The Team in the Face of Death” found in *In the Face of Death: Professionals Who Care*  
“Patient-Centered Care: Case Studies on End of Life,”  
Healing Hands, Vol. 22, No.1: Winter 2018  
Discuss reactions to these readings during class meeting |
|      |       | Identify various organizations that interface with the hospital and physician's role in death situations (i.e., organ donation agency; funeral home; bereavement counseling agencies, etc.) | |
|      |       | Describe ways in which interdisciplinary teamwork can be facilitated to benefit the dying and the bereaved | |
| 6    | Motivations & rewards; reflections on living & dying | Describe the Initial Motivation for Working with the Dying, Bereaved Families and be able to describe the factors that make this work worthwhile | Kamal, Arif, *et al.* (2016) “Prevalence and Predictors of Burnout among Hospice and Palliative Care Clinicians in the U.S.,” *Journal of Pain and Symptom Management*, Vol. 51 No. 4, April 2016  
Discuss reactions to these readings during class meeting |
|      |       | Identify Diversity Issues that Arise in Work with the Dying and their Families, as well as Treatment Indications that are Culturally Sensitive | |
|      |       | Describe what constitutes “A Good Death” | |
SJ) and focused on articles and book sections along with videos and vignettes to expressed shared experiences of the material and to solidify understanding of the topic.

In order to proceed with this study, we were reviewed for IRB approval and exempt (STUDY ID: PRO-2021-313). Students were required to complete one reflection paper at the end of the Selective (about 2-3 pages in length), reflecting on an issue that surfaced in the class discussions related to death, dying, and/or bereavement.

Assessment of the Selective is Pass-Fail and is based on attendance, engagement with the material, and participation with comments on students' performances that can be integrated into the Medical Student Performance Evaluation (MSPE).

To understand the impact and response of the course, four semesters were studied: Fall 2019, Spring 2020, Fall 2020, and Spring 2021. Students completed an online anonymous evaluation for all courses. The survey for the Selectives was short and asked participants to evaluate the course on its usefulness in their medical education with a Likert scale. The options given on the survey included “n/a,” “strongly disagree,” “disagree,” “neutral,” “agree,” and “strongly agree.” The sample size for the Fall 2019, Spring 2020, Fall 2020, and Spring 2021 semesters were 15, 13, 14, and 15, respectively. 12/15 people responded to the end of the Selective survey question and completed reflection papers for Spring 2021.

In addition to the survey, students were asked to complete a reflection paper detailing their experiences with conversations on death and dying prior to the class, their takeaways from the class, and how this class has impacted their mindset as a future physician. The sample size of students who submitted reflection papers for Fall 2019, Spring 2020, and Fall 2020 was 13, 15, 13, and 13, respectively. The reflection papers were then taken and analyzed for recurrent themes and commonalities. Qualitative responses were assessed by two researchers (SK, SR) in order to identify common themes. The two researchers developed themes a priori and assessed one semester of data, which was first reviewed independently and then conducted together to ensure standardization in extracting themes. They identified the a priori themes as well as emergent themes based on review. They then completed the coding tree inclusive of all themes elicited by first review. One semester was selected as a baseline as saturation of themes was achieved. A coding tree was developed and essays from subsequent semesters were assessed based on this structure of qualitative themes (Figure 1). There

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**Figure 1. Qualitative Themes for Medical Education Selective on Death and Dying.**
were several recurrent themes which emerged through the data coding. Frequency of responses were tracked to identify prominent themes across the semesters (Table 2). A qualitative approach to the analysis of reflective papers was adopted as it allowed flexibility and the generation of meaningful insights based on open-ended responses.

Additional psychometrics were administered for only the Spring 2021 course. The Toronto empathy scale and Budner tolerance for ambiguity score were administered before and after the course. Responses were statistically analyzed to determine if the course impacted empathy and tolerance for ambiguity.

Results
Data was taken from four semesters (Fall 2019, Spring 2020, Fall 2020, and Spring 2021) to answer the following statement using a Likert scale: this elective was useful in the medical student’s medical education experience. Students positively evaluated the course, rating it a 4.7 out of 5 (range for other Selectives 3.8–4.9). 90.7% (49/54) of the respondents answered that they agree or strongly agree with the statement that this Selective course was useful in the student’s medical education experience.

At the end of the course, the medical students enrolled were asked to write reflective papers focused on what they learned in the class and their observations and takeaways from the course. For the four semesters, there were 54 respondents for the survey, as well as 54 cumulative reflection papers. The top five qualitative themes that were brought up the most in the reflection papers of four semesters worth of classes (n=54 papers) were: the utility and instruction of the course (21 times), the importance of hospice and palliative care (20 times), avoidance of death (15 times), and taking a holistic approach to death (23 times).

Table 2. Qualitative responses in end-of-semester reflection papers (n=54).

| Themes                                | Fall 2019 | Spring 2020 | Fall 2020 | Spring 2021 | Total # of responses |
|---------------------------------------|-----------|-------------|-----------|-------------|----------------------|
| Death avoidance                       | 5         | 2           | 6         | 2           | 15                   |
| Treating a patient, not a diagnosis   | 5         | 5           | 2         | 1           | 13                   |
| Detached view of death                | 2         | 1           | 2         | 0           | 5                    |
| Importance of hospice/palliative care| 8         | 8           | 2         | 5           | 23                   |
| Holistic approach to death            | 2         | 1           | 3         | 0           | 6                    |
| Respecting patient autonomy           | 2         | 4           | 4         | 6           | 16                   |
| Quality of life                       | 2         | 0           | 2         | 0           | 4                    |
| Impact on family                      | 4         | 1           | 6         | 4           | 15                   |
| Provider burnout                      | 3         | 2           | 3         | 6           | 14                   |
| What it means to die a "good death"  | 4         | 4           | 2         | 2           | 12                   |
| Importance of a team                  | 2         | 1           | 3         | 3           | 9                    |
| Self-awareness                        | 1         | 0           | 0         | 0           | 1                    |
| Psychosocial aspects of death & dying| 2         | 0           | 2         | 2           | 6                    |
| Pain management                       | 1         | 0           | 0         | 0           | 1                    |
| Compassion/empathy                    | 3         | 2           | 2         | 3           | 10                   |
| Interpersonal connectedness           | 1         | 1           | 0         | 0           | 2                    |
| Comforting patients                   | 1         | 1           | 1         | 2           | 5                    |
| Condense reading                      | 5         | 0           | 0         | 0           | 5                    |
| Personal experiences with death       | 0         | 1           | 3         | 3           | 7                    |
| Learning how to grieve as a provider  | 3         | 2           | 3         | 5           | 13                   |
| Death of a child                      | 2         | 1           | 2         | 0           | 5                    |
| Medical ethics                        | 1         | 0           | 1         | 0           | 2                    |
### Themes and Their Frequencies

| Themes                                                   | Fall 2019 | Spring 2020 | Fall 2020 | Spring 2021 | Total # of responses |
|----------------------------------------------------------|-----------|-------------|-----------|-------------|----------------------|
| Afterlife                                                | 1         | 0           | 1         | 1           | 3                    |
| Unique pedagogical approach/ the utility and instruction of the course | 6         | 7           | 3         | 7           | 23                   |
| Breaking bad news to patients/families                   | 1         | 1           | 0         | 0           | 2                    |
| Changing needs of a patient                              | 1         | 1           | 0         | 0           | 2                    |
| The impact of COVID-19 on death                          | 0         | 5           | 1         | 2           | 8                    |
| Death anxiety                                            | 0         | 6           | 4         | 0           | 10                   |
| Necessity of this topic in med ed                         | 0         | 7           | 1         | 2           | 10                   |
| A lack of knowledge prior to this                        | 0         | 3           | 2         | 0           | 5                    |
| Plea for house calls                                     | 0         | 0           | 1         | 0           | 1                    |
| Could use more instances to learn from people in the field| 1         | 0           | 0         | 1           | 2                    |
| Perspective                                              | 1         | 0           | 0         | 0           | 1                    |
| Humanity in medicine                                     | 1         | 1           | 0         | 2           | 4                    |
| Understanding grief                                      | 0         | 1           | 0         | 0           | 1                    |
| Course for mental preparation                            | 0         | 1           | 0         | 0           | 1                    |
| Useful for future physicians                             | 0         | 5           | 6         | 3           | 14                   |
| Coping mechanisms                                        | 0         | 2           | 0         | 0           | 2                    |
| Role of religion in death                                | 0         | 1           | 0         | 0           | 1                    |
| Healing greater than curing                              | 0         | 2           | 0         | 0           | 2                    |
| Maintaining professionalism                              | 0         | 1           | 1         | 3           | 5                    |
| Pervasiveness of death in the medical profession         | 0         | 4           | 1         | 7           | 12                   |
| Mistrust in medicine from lack of access                 | 0         | 0           | 1         | 0           | 1                    |
| Do no harm                                               | 0         | 0           | 1         | 0           | 1                    |
| Need for advance directives                              | 0         | 0           | 1         | 0           | 1                    |

**Themes and their frequencies are shown in Table 2.**

In terms of course utility and structure, students appreciated the flexible nature of the Selectives, citing that, although there was a basic schedule and syllabus during each session, there was “no rigid schedule we had to stick by which made it great because while [they] also covered the necessary curriculum, [they] managed to also tailor it to [them] at the same time. This made it all the more enjoyable and informative.” Students also mentioned enjoying classroom discourse and one student described their experience as such: “Having a casual conversation with my peers about such an overlooked topic made me more comfortable addressing it.” Over all, comments surrounding the theme elaborated saying that the “discussion flowed easily in small groups,” that “meaningful conversations with peers were strengths,” and that the class “prepared us for a part of medicine that is often overlooked but crucial.” The differences between palliative and hospice care made an impact on the student participants. Students learned to view palliative care as, “the next step in properly caring for a patient,” rather than the “failure to provide adequate care.” On the topic of palliative care, a student wrote that “this course has helped me see that the switch to palliative care in cases such as this should not be seen as a failure to provide adequate care but rather as the next step in properly caring for a patient.”

The third common theme is regarding avoidance of topics related to death and dying. One student stated, “it is often
taken for granted that medical students are comfortable with death because they chose a career path where death is inevitable,” and claimed that, “more students have death anxiety than those who do not.” They felt that there is value in, “students being able to discuss this and confront their death anxiety.” Students commonly agreed that the content of this course is applicable to them and that they are “all aware [they’ll] face death at work,” even if they do not do a fellowship surrounding palliative or hospice care.

Students understood the role physicians play in the lives of patients but also the role they play in the lives of their loved ones. Students recognized this and stated “talking to patients and their families about fatal prognosis is a key role of a physician.” Several reflection papers mentioned biopsychosocial impacts on health outcomes of the patients.

The fifth most common theme gathered from the reflection papers was of patient autonomy. Ultimately, students said that it is important for physicians to create treatment plans that allow “patients’ end of life to be in a way they can tolerate as well.” Students talked about the importance of explaining comprehensive treatment options, and while this, “may not always line up with the best treatment plan, a textbook, or statistics,” physicians must ultimately respect the patients’ autonomy.

Results of pre- and post-testing (before and after the semester elective) with the Budner Tolerance for Ambiguity scale (p=0.70) and the Toronto Empathy scale (p=0.82) were not significantly different.

**Discussion**

Having conversations about dying and coping with death is something that most physicians will deal with in some capacity, yet there is a lack of medical education to prepare medical students for this important aspect of their careers. Additionally, an undercurrent in medical training often conjoins patient death with a failing on the part of the clinician rather than an expected outcome of a disease process the physician did not cause. Many students enrolled in this course emphasized the need for death education for medical students to enhance preparedness and serve as a resource for their patients. Literature shows the potential benefit in having formal coursework and bedside teaching to enhance medical student preparedness. Both the quantitative and qualitative results point to a course focused on death and dying providing a supportive framework for an important issue in a future physician’s practice.

The most common theme mentioned in the reflection papers was the perceived utility and instruction of the course. In the papers, students mentioned that they appreciated how the class was conducted and its unique pedagogical approach. Some of the comments were generally reflective of structure of the Selectives such as small class size and interactive, discussion-based approach. They also gave positive course feedback on the discussions and materials used and appreciated its meaningful instruction. Discussion-based learning can increase practical knowledge, improve long term understanding, and strengthen the comfort level of applying subject materials. Students similarly reported finding value in the discussion-based classroom environment and “felt as though it provided a forum for [them] to speak openly about death and [their] fears surrounding it.”

A student stated that they, “quickly became comfortable because the topic was approached with the more reasonable attitude that death is not inherently bad and that we can talk about it candidly.” The instructor (SJ) created a safe space where people felt comfortable in sharing their personal experiences and opinions on death and dying. A smaller class size allowed for a more intimate setting where students felt connected and comfortable. Another aspect of the class that students enjoyed was the content of the videos and readings for the class and the meaningful insight provided by the instructor.

The next most common theme was the importance of hospice and palliative care in medicine. Palliative care education for medical students is crucial, and there is literature showing the importance of adequate palliative training. Palliative and hospice care education in medical school can lead to a more humanistic approach to clinical care and allow for learning opportunities. Students frequently referred to how the class allowed them to understand the difference between hospice and palliative care. Learning the nuances between palliative and hospice care and understanding what they both entail was valuable to several students who took the class. Students appreciated exposure to a diverse body of literature to round out discussions of hospice and bereavement care and felt they could reflect on personal experiences with dying patients and family members.

Avoidance of topics related to death was a frequently cited thematic area. Many students felt a significant level of discomfort talking about death prior to taking this class. They felt unprepared to handle this taboo topic, even though they felt that, “it is a topic that as future healthcare providers and as members of society should talk more about. People who took this class were all aware of the inevitable nature of death in their profession, but felt the most unprepared to tackle this subject. Prior to taking the course they, “really had to think hard about how [they] might handle the situation or how comfortable [they] would be.” However, as the course progressed, many students felt that the lessons they have learned throughout this course “changed [their] outlook of death.” A common change in the students’ perspectives included the acceptance that death not being the worst possible clinical outcome. By the end of the course, students felt increased confidence in handling and coping with death, dying, and bereavement. Medical students often felt unprepared to deal with their emotions and cope with patient death while maintaining professionalism. Encouraging medical schools to include topics of spirituality, religion, hospice, and palliative care can also enhance the ability for students to learn how to process their emotions in the future.

“Having a casual conversation with [their] peers” made it comfortable to talk about the overlooked topic of death. Despite starting the class with death anxiety, students feel comfortable and are willing to, “discuss these topics in the future with other colleagues.”
Caring for family members and friends is a critical role as the physician must care for more than just the patient in front of them. The impact of a patient’s death extends across the lifetime of the patient and continues onward for loved ones who are still alive, exacting a significant mental, emotional, and physical toll on the family members. A physician should be able to recognize this and be intentional with how each family needs things explained to them. Often a family needs support in the psychosocial adjustments that take place when a family member is sick. Family caregivers may also experience mental impacts as they support the person who is ill. Several students talked about how their medical education is very science-based, and that sometimes humanity can be lost during the treatment of their patients as clinicians hyperfocus on treating the diagnosis alone. Students mentioned the importance of understanding the whole patient and, “considering all the factors in their life,” by focusing on biopsychosocial approaches to helping heal the patient. Many appreciated that the class stressed the importance of preserving humanity in medicine.

Respecting patient autonomy and letting patients have a say in their decision-making and end-of-life care was the fifth most common theme mentioned in the papers. Physicians are to prioritize the needs and wants of their patients, but students discussed that it can be challenging to set boundaries. Healthcare providers want to do what is in the best interest of their patients, and sometimes their idea of what is best may not be in line with what the patient wants for themselves. Rather than a hierarchical physician-patient relationship, a collaborative method where both sides share power can lead to an outcome that is best preferred by the sick patient. At some point, patients may change their decisions about how they want to proceed, and as students recognize that it is a physician’s duty to support and carry out that decision, even if it may conflict with their own professional opinion.

Limitations for this study include a small sample size, as this course was only active for four semesters, and single institution. As with much qualitative research, there is a component of subjectivity to the analysis of themes and the possibility of limited generalizability. There may also be uncontrolled factors such as selection bias as the students are allowed to rank order their preferences for the humanities courses and those with an existing interest in the subject may positively skew the results. Some students enrolled in the class did not submit their reflection paper and some students did not fill out the one-45 survey on usefulness of the course, thus adding potential confounding.

In addition, the endpoints assessed were not clinical but rather surrogate markers were assessed. As such, the impact of such a course on the actual clinical outcomes and the effect on practice of future physicians cannot be ascertained. The course was administered during the preclinical years of medical school, and it is possible that, when presented with actual dying patients, there may be other interventions that could prove more effective in supporting physicians, patients, and their families. The timing of the courses may have also influenced students’ responses since many were conducted during the COVID-19 pandemic; repetition of a similar study in a non-pandemic state may result in different results, specifically since students trained in the midst of the pandemic had a very different training environment than before or after. Nonetheless, the results from the quantitative and qualitative analyses are encouraging and future studies should address efficacy of such courses in the clinical encounter.

Conclusion
The need for education in death, dying, and bereavement in medical education is crucial and students recognize that end-of-life care, death, and dying in general are an extremely important part of becoming a physician. Inadequate or absent training on the effect of death and dying on their patients has the potential to negatively impact their ability to serve as empathic and competent physicians. This transcends specialty and is applicable to almost all physicians in one way or another.

At Cooper Medical School of Rowan University, we have tailored our course to medical students for their success in residency and future career. This course was well liked by participants longitudinally across four semesters. With this, a curriculum that focuses on helping medical students handle difficult conversations and emotions regarding death, dying, and bereavement is essential in medical education.

Data availability
Underlying data
OSF: Death and Dying Medical Education Elective Data
https://doi.org/10.17605/OSF.IO/VHBN4

This project contains the following underlying data:
- Qualitative Data One45 and Reflections-20220412T133826Z-001.zip
- Reviewing Responses_Themes for REFLECTION PAPERS.xlsx
- stats.docx
- App. B Course Readings Table.pdf

Extended data
OSF: Death and Dying Medical Education Elective Data
https://doi.org/10.17605/OSF.IO/VHBN4

This project contains the following extended data:
- Appendix A.pdf

Data are available under the terms of the Creative Commons Zero “No rights reserved” data waiver (CC0 1.0 Public domain dedication).

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Christy A. Denckla
Harvard T.H. Chan School of Public Health, Boston, Massachusetts, USA

Thank you for the opportunity to review this manuscript. Authors report results from a mixed methods study on the experiences and outcomes of students enrolled in a course on end-of-life education.

This contributes to the medical education community and will interest administrators and educators focused on integrating this very important topic into curriculums. My comments below focus largely on reorganizing the manuscript content and more closely aligning implications and conclusions with the scope of this exploratory study.

Abstract

The first line of the abstract in the background section – perhaps a more strength-based introductory sentence would be useful? Not all students and physicians find end-of-life discussions uncomfortable.

Introduction

The biopsychosocial approach can use some context. The authors do not introduce this framework substantively in the introduction. Doing so will help readers appreciate the conceptual framework that guided this curriculum.

The introduction could be reorganized to provide background on this study specifically. i.e. this is a mixed methods study on XXX. What is the objective of this study? The authors stop at the background on the necessity for a course (I agree) but then do not give background on the study itself that they go on to describe for the remainder of the paper.

Results

The content on IRB review in the method section should go into the ethics section.
This section could benefit from significant reorganization. One idea is to segment this section into subheadings and organize content around these subheads. For example:

**Study population**
- This section will describe students, enrollment, sampling, etc.
- What was the enrollment in each course. Sex %?

**Methods**
The paragraph that starts with “to understand the impact and response of the course....” This section should have a subheading – this is really the method of the course.

**Measures**
More information on study measures:
Survey information
Reflection papers
Toronto Empathy Scale
Budner Tolerance for Ambiguity scale

**Approach to Analysis**
- Qual analysis
- Quant analysis approach
- Pre/post testing

**Results**
- The first line repeats content from Methods

- Pre/post testing. Was this analysis done by class (there would be 4 tests in that case) or averaged across all 4 classes? What was the rationale for this approach?

- Was the comparison range for other “Selective” from Fall 2019-Spring 2021?

**Discussion**
- Discussion repeats results in many sections. Move content that pertains to results to the results section, and in the discussion, it would be great to see the interpretation of findings and integration with the literature.

- I would suggest constraining conclusions and generalizability of the study to more closely align with the study methods, which were based on observations made within a small, convenience sample. The extent to which findings generalize to all medical students or other programs is limited, given the study design.

**Limitations section**
- Missing surveys do not necessarily introduce confounding. It does introduce bias.
- No comparison groups – results are descriptive, with limits to generalizability.
Conclusion

What are future research directions? Follow-up surveys?

Is the work clearly and accurately presented and does it cite the current literature?
Partly

Is the study design appropriate and is the work technically sound?
Partly

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Have any limitations of the research been acknowledged?
Partly

Are all the source data underlying the results available to ensure full reproducibility?
Partly

Are the conclusions drawn adequately supported by the results?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Clinical Psychology and Psychiatric Epidemiology

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.
present detailed course contents and its delivery. I can see some of the previous reviewer comments. Some of which were covered however I agree to methodology part which still can be improved. The following points can help author to improve the following manuscript-

1. Course type: A six-week humanities course that "covers definitions of death and dying, the process of dying, ethical quandaries, and new concepts of the grieving process." However same is not mentioned across the paper.

2. English editing is essential in current manuscript.

3. Research design and qualitative and quantitative data specifications can add more clarity to the manuscript.

4. The abstract can be rewritten to better express the findings of the current study.

5. What is the new grieving process in this place? Not clear. As it is not mentioned later in the article.

6. The argument for course development and instructions required to include relevant citations from the literature in paragraph two. There is one citation for coping, but none for the remaining component like care, hospice etc.

7. Human Development Dimension which is mentioned in the intro is a little confusing, as in the entire course content (mentioned in the table), no component seems to focus on human development.

8. The course's goal must be stated consistently throughout. It varies greatly depending on where you go.

9. The method of data collection and its organization can be mentioned. The IRB approved the project in two sections. Please double-check it.

10. If the author used thematic analysis, guidelines can be included here. For example Six steps and coding types, as described by Barun and Clarke (2006), can be mentioned here to provide a better understanding of the data analysis procedure and how the registry has been managed or any other framework utilized by the author.

11. Death education is clearly mentioned in the discussion section, but it is not mentioned in the introduction. Please make the rationale consistent.

12. Because the topic and course are extremely sensitive. How the participants' mental health was cared for, as the manuscript claims students found it uncomfortable to discuss the subject. It can be mentioned in procedure.

13. Dr. Ines Testoni has done a lot of work in this area that is not mentioned anywhere in the discussion. That could be relevant and useful in this case.

Is the work clearly and accurately presented and does it cite the current literature?
Partly

Is the study design appropriate and is the work technically sound?
Partly

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Have any limitations of the research been acknowledged?
Yes

Are all the source data underlying the results available to ensure full reproducibility?
Partly

Are the conclusions drawn adequately supported by the results?
Partly

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Mixed method, both qual and quant, death education, suicide prevention, intervention studies, sensing and mental health

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 26 July 2023

https://doi.org/10.21956/mep.20794.r34289

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Paul Victor Patinadan
Nanyang Technological University, Singapore, Singapore

The manuscript considers a 6-week ‘selective’ course focusing on the topics of death, dying and bereavement for medical students. Qualitative analyses were employed with participant reflections as the data points. Quantitative data was also collected and analysed. The authors were clear in describing in detail the content and instruction for their Selective.

The manuscript in its current form has already seen some revision, and I believe it is very close to
reaching a successful publication standard. I thank the previous reviewers for their comprehensive work, and looking through their comments, am in general agreement with their views. The current authors' work is an important undertaking, as dealing with EoL issues will always be a vocational prerogative for healthcare professionals. The merits of the piece are its succinct literature review, detailed curricula example, and comprehensive discussion.

I do, however, feel that the qualitative methods and analysis require a little more detail. Was there an ontological/epistemological stance employed when dealing with the data (constructivist etc.)? How were a priori themes generated and agreed upon? What software was employed in this process? Some minor inclusions to showcase the rigour of the work.

Additionally, the authors mention that quantitative analyses were carried out. I feel that without any statistical analyses and interpretation, one cannot deem descriptive data (such as whether students found the course useful) as truly quantitative. There were pre-post test analyses involved (Empathy/Ambiguity scales), but these were only very briefly mentioned as not significant and not discussed again. Non-significant findings are also useful and can provide critical insight, especially if they might be at odds with the qualitative data analyzed. In this case, these numbers can show that proceeding through a structured curriculum isn't enough to impact the deep-set values of empathy or practical wisdom of dealing with ambiguity. These might come later from practice and immersion in the field (similar to what another reviewer had mentioned). These are some insights that can be considered in the discussion.

Overall, this is a very useful manuscript for the journal's audience, just a little more critical insight would be adequate to push the piece to successful publication.

**Is the work clearly and accurately presented and does it cite the current literature?**
Yes

**Is the study design appropriate and is the work technically sound?**
Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**
Partly

**If applicable, is the statistical analysis and its interpretation appropriate?**
Partly

**Have any limitations of the research been acknowledged?**
Yes

**Are all the source data underlying the results available to ensure full reproducibility?**
Yes

**Are the conclusions drawn adequately supported by the results?**
Yes

**Competing Interests:** No competing interests were disclosed.
Reviewer Expertise: Mixed-methods research, Thanatology and End of Life issues, Health Professions Education, Pedagogy Development, Medical Humanities

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Version 3

Reviewer Report 20 September 2022

https://doi.org/10.21956/mep.20671.r32507

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Kelly Melekis
Social Work, Skidmore College, Saratoga Springs, NY, USA

Overall, the authors contribute to the body of literature regarding medical education on death, dying, and end-of-life care. As the authors note, there is still a relative dearth of courses/curricula on this topic despite its universal nature.

My main concerns about this manuscript are as follows:

1. There is insufficient detail on the methods, particularly the qualitative methods used to analyze the reflection papers. The authors discuss themes, however, there is not enough detail to assess how these themes were determined (or how they were determined a priori) and whether the method was sound. Related, I would recommend edits to the tables, particularly Tables 2 and 3. Table 2 includes a sample of comments on the course, however, a table with sample quotes that represent specific themes would be more useful. Table 3 is a quantification of the qualitative responses. First, this reads as a list of topics or words, not themes. Again, this speaks to a lack of methodological clarity. I would recommend further analysis of the qualitative data following clarification of the qualitative method utilized.

2. While the authors raise some important limitations, I think it is important to acknowledge the potential impact of the context of COVID on the data collected. Given that the majority of data (but not all) was collected during COVID, it seems worth noting that this could have an impact on how medical students approach and evaluate a selective on death and dying.

Is the work clearly and accurately presented and does it cite the current literature?
Yes

Is the study design appropriate and is the work technically sound?
Partly

Are sufficient details of methods and analysis provided to allow replication by others?
No

If applicable, is the statistical analysis and its interpretation appropriate?
Yes

Have any limitations of the research been acknowledged?
Yes

Are all the source data underlying the results available to ensure full reproducibility?
Yes

Are the conclusions drawn adequately supported by the results?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: gerontology, end-of-life care, end-of-life education, health and well-being of vulnerable older adults, health impacts of housing and social environment, interprofessional practice, evaluation, qualitative methods

I confirm that I have read this submission and believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.

Author Response 04 Nov 2022
Simran Kripalani

Overall, the authors contribute to the body of literature regarding medical education on death, dying, and end-of-life care. As the authors note, there is still a relative dearth of courses/curricula on this topic despite its universal nature.

Thank you. We appreciate the reviewers assessment of the topic and its appropriateness in medical education.

My main concerns about this manuscript are as follows: There is insufficient detail on the methods, particularly the qualitative methods used to analyze the reflection papers.

The authors discuss themes, however, there is not enough detail to assess how these themes were determined (or how they were determined a priori) and whether the method was sound.

Thank you. We added greater clarity to the Methods section and hope this addresses the reviewer’s concerns.
Related, I would recommend edits to the tables, particularly Tables 2 and 3. Table 2 includes a sample of comments on the course, however, a table with sample quotes that represent specific themes would be more useful. Table 3 is a quantification of the qualitative responses. First, this reads as a list of topics or words, not themes. Again, this speaks to a lack of methodological clarity.

I would recommend further analysis of the qualitative data following clarification of the qualitative method utilized.

We thought it best to eliminate Table 2, based on the reviewer’s comments. We also restructured the second table and organized the thematic content under “provider-centric” and “patient-centric” comments.

While the authors raise some important limitations, I think it is important to acknowledge the potential impact of the context of COVID on the data collected. Given that the majority of data (but not all) was collected during COVID, it seems worth noting that this could have an impact on how medical students approach and evaluate a selective on death and dying.

Thank you and we agree that COVID-19 has had significant, perhaps as yet uncharacterized impacts on our students and residents. We added this to our “Limitation” section. We hope that these revisions are acceptable but would be happy to further adapt the manuscript at your discretion.

**Competing Interests:** No competing interests were disclosed.

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Reviewer Report 01 September 2022

https://doi.org/10.21956/mep.20671.r32489

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Anastasia Kunac
Division of Trauma and Surgical Critical Care, Department of Surgery, Rutgers New Jersey Medical School, Newark, NJ, USA

Sheila Rugnao
Rutgers New Jersey Medical School, Newark, NJ, USA

We have no further comments/concerns related to this publication.

**Is the work clearly and accurately presented and does it cite the current literature?**
Partly

**Is the study design appropriate and is the work technically sound?**
Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Have any limitations of the research been acknowledged?
Partly

Are all the source data underlying the results available to ensure full reproducibility?
Partly

Are the conclusions drawn adequately supported by the results?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Education, Palliative Care, General Surgery, Trauma, Surgical Infection

We confirm that we have read this submission and believe that we have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 2

Reviewer Report 10 August 2022

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Anastasia Kunac
Division of Trauma and Surgical Critical Care, Department of Surgery, Rutgers New Jersey Medical School, Newark, NJ, USA

Sheila Rugnao
Rutgers New Jersey Medical School, Newark, NJ, USA

We have reviewed the recent revisions. There are a few minor issues that require attention. We would recommend conditional approval provided that these discrepancies can be addressed:

The abstract should be consistent, numerically, with the results and methods section. (ie the N # of people included in the various assessments)
The discussion section has been edited for readability, however, there is still a discrepancy on the N number of people included for the Likert survey and the reflective paper. The first paragraph states that only 3 semesters were used for the Likert survey, but that in the survey 49/54 agreed the course was useful. The second paragraph of the results section states there were 42 respondents for the survey and 41 for the reflection paper. However, there is a total N of 54 for all semesters and a total number N=54 included in Table 3 (qualitative responses for reflection papers).

Is the work clearly and accurately presented and does it cite the current literature?
Partly

Is the study design appropriate and is the work technically sound?
Partly

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Have any limitations of the research been acknowledged?
Partly

Are all the source data underlying the results available to ensure full reproducibility?
Partly

Are the conclusions drawn adequately supported by the results?
Partly

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Education, Palliative Care, General Surgery, Trauma, Surgical Infection

We confirm that we have read this submission and believe that we have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however we have significant reservations, as outlined above.
Anastasia Kunac
Division of Trauma and Surgical Critical Care, Department of Surgery, Rutgers New Jersey Medical School, Newark, NJ, USA

Sheila Rugnao
Rutgers New Jersey Medical School, Newark, NJ, USA

The work by Dr. Kripilani and colleagues is novel, important, and should be part of any medical school curriculum. The authors are to be commended on their commitment to provide comprehensive education around death and dying as it is the natural consequence of living and not explored frequently or adequately by those who practice medicine.

We have several concerns about the article in its current form. The manuscript appropriately cites current literature, but some of the language is not clear. There are a number of grammatical errors, and incomplete sentences that should be addressed, including a misspelling in the title of figure 1.

A mixed methods approach to evaluating the course is presented. This approach is reasonable, but it is difficult to parse out the results of the study as they are presented in part within the Methods section and only sparsely in the Results section. It would be helpful to illustrate how the representative student comments were sifted/sorted to the themes identified. Further, the Methods section should include a reference to IRB approval for the study which would imply that the medical students gave consent for their coursework to be used in this manner.

The methods section also describes the Likert scale that was used to evaluate the usefulness of the course. The paper states the information is shown in Table 3, however, table 3 is a qualitative evaluation on themes that were presented in the reflection papers. Table 2 is described in the text as “themes that were most prominent” however the table includes selected specific verbatim comments, not themes.

Much of the information presented in the discussion should be included in the results section in a clear and concise manner. There is a discrepancy of the total number of participants, responders, and number included in Table 3. These discrepancies should be addressed ((N=50 in table 3, but 57 participants and 54 responders noted elsewhere).

The limitations of the study are clearly articulated and the conclusions drawn are mostly reasonable. The authors make a jump in the final sentence of the paper that learning about death and dying will translate to the students' ability to have difficult conversations about death and dying. This is NOT a reasonable conclusion unless those skills are explicitly taught and evaluated. Simply learning the subject matter does not necessarily translate into good physician-patient or physician-family communication. Simulated encounters could be used to ascertain if the students are able to "put it all together" and translate their knowledge to clinical skills, but that seems beyond the scope of the curriculum presented.
Is the work clearly and accurately presented and does it cite the current literature?  
Partly

Is the study design appropriate and is the work technically sound?  
Partly

Are sufficient details of methods and analysis provided to allow replication by others?  
Yes

If applicable, is the statistical analysis and its interpretation appropriate?  
Yes

Have any limitations of the research been acknowledged?  
Yes

Are all the source data underlying the results available to ensure full reproducibility?  
No source data required

Are the conclusions drawn adequately supported by the results?  
Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Education, Palliative Care, General Surgery, Trauma, Surgical Infection

We confirm that we have read this submission and believe that we have an appropriate level of expertise to state that we do not consider it to be of an acceptable scientific standard, for reasons outlined above.

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**Comments on this article**

**Version 2**

Author Response 16 Aug 2022  
Simran Kripalani

Thank you for your thorough review. We apologize for the discrepancy in number of respondents/papers throughout the article. The abstract as well as the discussion has been modified to reflect the correct number of papers and survey responses received (n=54).

**Competing Interests:** No competing interests were disclosed.

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**Version 1**
Simran Kripalani

Thank you to reviewers Dr. Kunac and Dr. Rugnao for reviewing the first draft of our paper. This updated version of the manuscript has been updated to address all concerns that peer reviewers brought up about the manuscript. This includes, but is not limited to: further clarity in explanations and methods used to extract themes, the inclusion of the IRB study exemption, additional results in the proper section, a correction of all discrepancies (such as mislabeled tables/conflicting # of papers), and an edit to the final sentence of the paper.

**Competing Interests:** No competing interests were disclosed.