Title

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Medical student knowledge of oncology and related disciplines: A targeted needs assessment

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Abstract

Background/Purpose—Despite increasing numbers of cancer survivors, non-oncology physicians report discomfort and little training regarding oncologic and survivorship care. This pilot study assesses medical student comfort with medical oncology, surgical oncology, radiation oncology, hospice/palliative medicine, and survivorship care.

Methods—A survey was developed with input from specialists in various fields of oncologic care at a National Cancer Institute-designated comprehensive cancer center. The survey included respondent demographics, reports of experience with oncology, comfort ratings with oncologic care, and five clinical vignettes. Responses were yes/no, multiple choice, Likert scale, or free response. The survey was distributed via email to medical students (MS1-4) at two United States medical schools.

Results/Findings—The 105 respondents were 34 MS1s (32%), 15 MS2s and MD/PhDs (14%), 26 MS3s (25%), and 30 MS4s (29%). Medical oncology, surgical oncology, and hospice/palliative medicine demonstrated a significant trend for increased comfort from MS1 to MS4, but radiation oncology and survivorship care did not. MS3s and MS4s reported the least experience with survivorship care and radiation oncology. In the clinical vignettes, students performed the worst on the long-term chemotherapy toxicity and hospice/palliative medicine questions.

Discussion—Medical students report learning about components of oncologic care, but lack overall comfort with oncologic care. Medical students also fail to develop an increased self-

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assessed level of comfort with radiation oncology and survivorship care. These pilot results support development of a formalized multi-disciplinary medical school oncology curriculum at these two institutions. An expanded national survey is being developed to confirm these preliminary findings.

Introduction

Despite a growing population of cancer patients and survivors, non-oncology physicians report significant discomfort and little training with oncologic and survivorship care [1–4]. For example, only 7% of primary care physicians and 4% of oncologists report receiving training in survivorship care during medical school [2; A. Potosky, February 2014]. Physician unfamiliarity with the entire spectrum of oncologic care, including radiation oncology and survivorship care, represents how a lack of exposure and training during medical school may impede optimal multidisciplinary oncologic care later on. We hypothesized that medical student self-reported knowledge would vary by oncologic specialty. This brief report describes medical student knowledge, comfort, and experience with oncology including medical oncology, surgical oncology, radiation oncology, hospice/palliative medicine, and survivorship care from two US medical schools as a pilot needs assessment for curricular innovations related to oncology.

Methods

An anonymous, internet-based survey was developed with input from specialists in various fields of oncologic care at a NCI-designated comprehensive cancer center (Online Resource 1). To establish survey validity, input was obtained from a medical oncologist, thoracic surgeon specializing in oncology, radiation oncologist, hospice/palliative care expert, pediatric oncologist, and survivorship expert. These specialists from two National Cancer Institute designated comprehensive cancer centers provided topics and questions they felt students should be comfortable with by the end of their undergraduate medical training and reviewed the resulting survey. The survey was divided into five sections: 1) Clinical vignettes of survivorship topics, 2) Prior oncology experience, 3) Oncology knowledge, 4) Survivorship knowledge, and 5) Future career interests/Demographics. Responses were yes/no, multiple choice, Likert scale (1 = Not at all, 5 = Extremely), or free response. Likert scales are reported as median (interquartile range). The survey was distributed via email to students (MS1-4) at two US medical schools affiliated with NCI-designated cancer centers. Emails were sent to class listservs. The survey remained open from April 15, 2014, to May 5, 2014. Three reminder emails were sent. Data were analyzed using Stata v12.0 (StataCorp LP, College Station, Texas). Internal reliability was calculated for the oncology knowledge section using Cronbach’s alpha. Interval data was compared using the Student t-test and analysis of variance. Ordinal data was compared using the Wilcoxon Rank-sum and Kruskall-Wallis tests. This study was approved by the Institutional Review Board at both institutions as exempt.

Results

Responses were obtained from 105 of 940 medical students (11%). Respondents were 34 MS1s (32%), 15 MS2s and MD/PhDs (14%), 26 MS3s (25%), and 30 MS4s (29%). Sixty-six students from the University of XXXX and 39 students from the University of XXXX returned complete responses.

Sixty-one percent of MS3s and MS4s indicated that they completed a clinical clerkship related to oncology as part of either the core clerkships or as an elective. Medical oncology and surgical oncology were the most common. No students completed a rotation in hospice/palliative medicine and 4% of MS3s and 7% of MS4s completed a rotation in radiation oncology. Twenty-seven percent of MS4s indicated that they planned to pursue a career in oncology.

MS1s indicated minimal exposure to oncology. MS3s and MS4s had the most exposure to oncology via regular lectures, guest lectures, and shadowing. Many MS3s and MS4s reported exposure via regular lectures to medical oncology (MS3 = 77%, MS4 = 73%), hospice/palliative medicine (65%, 56%), and surgical oncology (58%, 40%), but fewer reported exposure to radiation oncology (38%, 27%) and survivorship care (15%, 10%). The pattern was also seen for MS3s and MS4s in guest lectures and shadowing. Students who reported exposure to a specialty had greater comfort with it. This relation was seen for medical oncology (median 2 (interquartile range 2–3) vs. 1 (1–1), $p < 0.01$), surgical oncology (2 (2–3) vs. 1 (1–1), $p < 0.001$), radiation oncology (1 (1–3) vs. 1 (1–1), $p < 0.01$), hospice/palliative medicine (3 (2–3) vs. 2 (1–2), $p < 0.01$), and survivorship care (1 (1–2) vs. 1 (1–1), $p < 0.05$).

Clinical Vignettes

Students selected the correct answer on the five clinical vignettes 61% of the time. Correct answers by year were MS1: 23%; MS2: 63%; MS3: 78%; MS4: 72%. Completing a clinical clerkship in a particular oncologic discipline was not significantly associated with an increased probability of answering questions pertaining to the associated discipline correctly. MS3s and MS4s performed the worst on the questions pertaining to long-term chemotherapy toxicity and hospice/palliative medicine. In contrast, the MS3s and MS4s performed better on questions relating to genetic counseling for breast cancer, secondary neoplasm risk following radiation therapy, and surgical oncology risk. Internal reliability for the vignettes was moderate. Cronbach's alpha was 0.62.

Oncology knowledge

Internal reliability for the oncology knowledge section was high. Cronbach's alpha for the entire oncology knowledge section and its subsections of general knowledge, when to consult, and the short/long-term consequences was 0.95, 0.79, 0.83, and 0.92, respectively.

Senior students reported feeling more comfortable compared to junior students with medical oncology, surgical oncology, and hospice/palliative medicine, but not with radiation oncology and survivorship care (Table 1). Students were the most comfortable with their knowledge of hospice/palliative medicine, followed by medical oncology, surgical oncology,

radiation oncology, and then survivorship care. MS4s indicated they were a median of "not at all comfortable" with their knowledge of radiation oncology and survivorship care, while they were "moderately comfortable" with medical oncology, surgical oncology, and hospice/palliative medicine. Survivorship, followed by radiation oncology, were rated the lowest. Similarly, for knowledge of when to consult an oncologic specialty, MS3s and MS4s reported the least comfort with survivorship care and radiation oncology.

MS3s and MS4s also rated themselves as "not at all comfortable" with both the short- and long-term benefits of survivorship care. Ratings were at or below a median of 2.5 (between "somewhat comfortable" and "moderately comfortable") for most of the survivorship topics including questions about finding information about survivorship care and then delivering physical and psychological care.

Discussion

Physicians in all specialties—and especially primary care physicians—will care for an increasing number of cancer patients and survivors [4]. Therefore, a strong understanding of cancer treatments, oncologic specialties, and survivorship care is essential for physicians in training. Introducing these topics during undergraduate medical education may signal importance for later learning and support a multidisciplinary culture in oncologic care. Others are proposing and implementing such curricula, such as the *Ideal Oncology Education* project's survey of current curricula and recommendations in Australia and comprehensive curricula at the Boston University School of Medicine and in Canada [5–7].

In this pilot study, medical students report learning about components of, but lack overall comfort with, oncologic care. Medical students also fail to develop an increased self-assessed level of comfort with radiation oncology and survivorship care, both of which are integral components of multidisciplinary oncology care. This may indicate that these topics are part of the "null curriculum" [8, 9]. Students were especially deficient in exposure and comfort with survivorship care. One MS4 stated, "[I] had no exposure whatsoever to cancer survivorship care. Frankly, I don't think I can even define it let alone delineate it from other oncologic areas of care." Primary care physicians also express ambivalence about survivorship care and rarely become involved in this aspect of their patients' care despite the health risks faced by this population [10–12]. By developing multidisciplinary curricula that cover the oncologic care spectrum, future physicians may better recognize the importance of survivorship care.

This pilot study was limited by a low response rate, selection bias by responses potentially from students with an interest in oncology, or social desirability bias. Nevertheless, the findings support broader investigations of undergraduate medical oncology education. Additionally, innovative multi-disciplinary oncology curricula should be developed to address the gap in physician education pertaining to oncology.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Table 1

Self-reported medical student comfort with knowledge of oncologic specialties, when to consult them, and the short and long term side effects or benefits of routine oncologic interventions. Medical student comfort differed significantly between year in medical school for medical oncology ($p < 0.001$), surgical oncology ($p < 0.001$), and hospice/palliative medicine ($p < 0.001$), but not for radiation oncology ($p = 0.22$) or survivorship care ($p = 0.25$).

How comfortable are you with your knowledge of X as a medical specialty?	**Overall p < 0.01**	**MS1 p = 0.15**	**MS2/MD PhD p = 0.28**	**MS3 p < 0.01**	**MS4 p < 0.01**
Medical Oncology	2(1.5–3)	1(1–2)	2(2–2)	2.5(2–3)	3(2–4)
Radiation Oncology	1(1–2)	1(1–2)	1(1–1)	2(1–2)	1(1–3)
Surgical Oncology	2(1–3)	1(1–2)	1(1–2)	2(2–3)	3(2–4)
HPM	2(2–3)	2(1–2)	2(2–2)	3(2–3)	3(3–4)
Survivorship Care	1(1–1)	1(1–1)	1(1–1)	1(1–2)	1(1–2)
How comfortable are you with your knowledge of when X should be consulted for a patient?	**Overall p < 0.01**	**MS1 p = 0.14**	**MS2/MD PhD p = 0.73**	**MS3 p < 0.01**	**MS4 p < 0.01**
Medical Oncology	2(1–3)	1(1–2)	1(1–2)	3(2–4)	3.5(3–4)
Radiation Oncology	1(1–2)	1(1–1)	1(1–1)	2(2–2)	2(1–3)
Surgical Oncology	2(1–3)	1(1–1)	1(1–2)	3(2–4)	3(2–4)
HPM	2(1–3)	1(1–2)	2(1–2)	3(2–3)	3(3–4)
Survivorship Care	1(1–1)	1(1–1)	1(1–1)	1(1–2)	1(1–2)
How comfortable are you with your knowledge of the short-term adverse effects/role of X?	**Overall p < 0.01**	**MS1 p = 0.65**	**MS2/MD PhD p = 0.03**	**MS3 p < 0.01**	**MS4 p < 0.01**
Medical Oncology	2(1–3)	1(1–2)	2(1–3)	3(2–3)	3(2–3)
Radiation Oncology	2(1–2)	1(1–2)	1(1–2)	2(2–3)	2(1–3)
Surgical Oncology	2(1–3)	1(1–1)	2(1–2)	2(2–3)	3(3–4)
HPM	2(1–3)	1(1–2)	2(1–2)	2(2–3)	3(3–4)
Survivorship Care	1(1–1)	1(1–1)	1(1–1)	1(1–2)	1(1–2)
How comfortable are you with your knowledge of the long-term adverse effects/role of X?	**Overall p < 0.01**	**MS1 p = 0.78**	**MS2/MD PhD p = 0.08**	**MS3 p < 0.01**	**MS4 p < 0.01**
Medical Oncology	2(1–3)	1(1–2)	2(2–3)	2(2–3)	2(2–3)
Radiation Oncology	2(1–2)	1(1–1)	2(1–2)	2(2–2)	2(2–3)
Surgical Oncology	1(1–2)	1(1–1)	2(1–2)	2(2–3)	3(2–3)
HPM	2(1–3)	1(1–2)	2(2–3)	3(2–3)	3(3–4)
Survivorship Care	1(1–1)	1(1–1)	1(1–1)	1(1–2)	1(1–2)

Data is displayed as median (interquartile range) and the comfort level is compared within training years (columns) using the Kruskal-Wallis one-way analysis of variance.