Education for Health,
Vol. 19, No. 1, March 2006, 61 – 70

Taylor & Francis
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ORIGINAL RESEARCH PAPER

Medical Students' Views of Undergraduate Oncology Education: A Comparative Study

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ABSTRACT **Context:** *An ongoing concern of undergraduate medical education regarding oncology has been intensified in Patras Medical School, Greece, aiming at a more comprehensive teaching approach.*
Objective: *A second-step research project was conducted to examine medical students' views of their undergraduate education in oncology, six years after the first investigation, and to assess the impact of the changes on the curriculum.*
Methods: *The same questionnaire used in the previous study was again distributed to 210 different medical students.*
Findings: *Our study revealed that although the quality of education in Oncology has been improved, it has not as yet reached high standards. The improvements over the last six years were mainly attributed to the increased presence of specialized oncology staff and their coordination with other basic and clinical scientists, as well as to the increased focus on research issues. Most of the students suggested putting more emphasis on psychosocial aspects of cancer care and ethical topics.*
Discussion: *Despite the progress made in the curriculum, there is still a need for further improvements in the students' undergraduate education so as to meet current demands. Medical education in Greece still pays lip service to communication and ethical issues while remaining disease-oriented in its approach. Therefore, the target of undergraduate education in Oncology should not only be the provision of updated medical knowledge, but also the development of a proper attitude towards all cancer-related issues.*

KEYWORDS *Undergraduate education, practice, medical curriculum, oncology.*

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Education for Health ISSN 1357-6283 print/ISSN 1469-5804 online
http://www.tandf.co.uk/journals
DOI: 10.1080/13576280500534552

Context

A major concern of university medical programs currently is the improvement of undergraduates' education in Oncology. At a time when disease prevention and early detection are highly emphasized (Pomrehn *et al.,* 2000), an updated core medical curriculum would contribute to the upgrading of medical students' educational background, and facilitate the attempt to eliminate prejudice towards cancer and strengthen the doctor-patient interaction (Maughan *et al.,* 2001; Miller *et al.,* 2000).

Based on previous observations on students' views regarding the status of undergraduate oncology education (Andrikopoulos *et al.,* 1999), the Division of Oncology of the Department of Medicine as well as all the other Divisions and Departments of Patras Medical School in Greece have improved their teaching programs focusing on the establishment of a more coordinated undergraduate oncology education. Although the educational guidelines of the medical school do not differ from those of other medical schools abroad, initiatives have been taken over the last six years to ameliorate the fragmentation and overlapping of oncology education in the basic and clinical sciences. Moreover, attempts have been made to integrate the combination of updated medical knowledge and the development of a more realistic and critical approach to clinical education and practice.

Previous reports have outlined the reluctance or fear of medical students to become actively involved with cancer patients' care and communicate with them (Cohen *et al.,* 1982; Klein *et al.,* 2000; De Vries *et al.,* 2002). Taking into account those remarks and considering that cancer is a disease requiring multidisciplinary cooperation (Sanidas *et al.,* 1993), Patras Medical School has tried to increase the theoretical oncology background in both basic and clinical years, to provide a satisfactory number of elective oncology courses by various subspecialties and to enhance students' positive attitude towards psychosocial aspects of cancer care.

Objective

The aim of the present report was to investigate the views of undergraduate medical students at the University of Patras about the status of Oncology in the revised curriculum, six years after the first study was conducted at the same school, and to compare the findings with the prospect to assess the impact of the changes on the curriculum.

Methods

The first study was conducted in 1996 and was initially based on the curricula of the five major medical schools in Greece together with the University of Patras Medical School, and a number of medical schools abroad, from which we

received curricular information by correspondence. Compulsory and elective courses were determined, together with the clinical practice in which oncology topics were taught as well as the hours devoted to oncology education. Subsequently, a questionnaire[1] was formulated and distributed to 210 students at their fourth-, fifth- and sixth-year of study (70 students in each year) at the University of Patras Medical School. The response rate was approximately 70% (147/210). The questionnaire included five multiple-choice questions, and the students were asked to tick one or more boxes for each. The questionnaire was anonymous and was immediately returned to us.

The data from this study revealed insufficiencies in oncology education at the University of Patras Medical School, mainly attributed to lack of a coordinated oncology curriculum, inadequate clinical practice, and limited infrastructure and research. Moreover, the students had several suggestions for upgrading the status of oncology education. Based on those remarks, an attempt was made to improve the undergraduate medical education in oncology (Table 1). The number of instruction hours, given in Table 1, represents the total teaching hours of the compulsory basic and clinical courses as well as the elective courses that include oncology topics. The hours of instruction in the compulsory courses were also devoted to other non-oncology-related subjects, and it was impossible to determine specifically the accurate hours dedicated solely to oncology issues. On the other hand, the teaching hours of elective courses represent the actual number of hours devoted to oncology, since these courses have focused on cancer.

The main changes in Oncology that occurred in the undergraduate medical curriculum as a result of the publication of the first report are the following:

(a) Increase in the number of specialized oncology staff (i.e., medical oncologists, psychologists, nurses).
(b) Increase in the instruction hours of compulsory clinical courses focusing on cancer-related issues by specialized oncologists in conjunction with other clinical subspecialties and with basic medical scientists aiming at evidence-based medical education and practice.
(c) Increase in the range of elective basic and clinical courses oriented towards more specialized cancer topics, such as molecular oncology, molecular pharmacology, immunohaematology, radiotherapy, palliative medicine, and research issues.
(d) Increase in the elective medical rotations (most of them with a 3-week duration) through specialties directly managing cancer patients, such as medical oncology, radiotherapy, and haematology-oncology.
(e) Distribution of a comprehensive book to the 4th year students compiled by the staff of the Division of Oncology, containing basic theoretical issues and clinical aspects of Medical Oncology.

[1]Readers may contact the last author for a copy of this questionnaire.

Table 1. Total hours of instruction in compulsory (basic and clinical sciences) and elective courses that include oncology topics in Patras Medical School

	1996	2002
Compulsory courses		
Basic Sciences	406 h	456 h
Clinical Sciences	665 h	1224 h
Clinical Practice	48 wk	60 wk
Elective courses		
Basic Sciences	0	192 h
Clinical Sciences	0	76 h
Clinical Practice	0	21 wk

Source: Undergraduate Course Guide of University of Patras Medical School, academic years 1996–1997 & 2002–2003.

Based on the aforementioned changes in the syllabus of the medical school, we initiated a second-step investigation to evaluate the extent to which these changes had any impact on the status of oncology education and, consequently on students' attitudes. Following the previous investigation, we distributed the same questionnaire to 210 students at their fourth-, fifth- and sixth-year of study (70 students in each year) in 2002.

Analysis

Data were analyzed using SPSS for Windows version 9.0. The χ^2 and Fisher's exact tests were applied to compare the students' views in the six-year period. All tests were two-tailed and statistical significance was set at $p \leq 0.05$.

Findings

Two-hundred-and-ten medical students participated in the comparative study in 2002, with a response rate of 94% (198/210). First, the quality of education in Oncology was evaluated (question 1 of Table 2). It was found that in 2002, 113 out of 198 (57%) students considered it satisfactory, whereas in 1996 only 53 out of 147 (36.1%) students expressed the same opinion ($p = 0.001$). However, in both cases a remarkable low percentage answered that the quality of education was high (3.3% in 1996 versus 5.5% in 2002, $p > 0.05$).

Students also offered valuable clues about the reasons of the sufficiency or insufficiency of the oncology education status, as shown in questions 2 and 3 of Table 2. The more favourable responses of the 2002 group compared to the 1996 group could be mainly attributed to the quantitative and qualitative enhanced presence of specialists ($p = 0.001$) and the increased tutorial and practical approach to cancer research ($p = 0.001$). However, it seems that the total amount of instruction hours dedicated to oncology-related topics is still

Table 2. Questionnaire and student responses

Question	1996 *n* (%)	2002 *n* (%)	*p*
1. How would you evaluate the quality of education in Oncology?			
High	5 (3.3)	11 (5.5)	NS
Satisfactory	53 (36.1)	113 (57.0)	0.001
Average	82 (55.7)	67 (34.0)	0.001
Low	7 (4.9)	7 (3.5)	NS
*2. To what do you attribute your (a) insufficient/ (b) sufficient training in Oncology?**			
(a) Insufficient	110 (74.6)	110 (55.5)	0.001
Lack of specialized scientists	47 (42.5)	11 (10.0)	0.001
Limited hours of instruction	56 (51.0)	73 (66.3)	0.005
Lack of clinical practice	73 (65.9)	106 (96.3)	0.001
Limited infrastructure and research	58 (53.2)	35 (31.8)	0.001
(b) Sufficient	23 (15.9)	77 (38.9)	0.001
Instruction by specialized scientists	0	59 (76.6)	0.001
Satisfactory number of hours of instruction	21 (90.0)	51 (66.2)	0.001
Satisfactory clinical practice	2 (10.0)	8 (10.3)	NS
Sufficient infrastructure and research	0	5 (6.5)	0.001
3. Are there any Oncology specialists teaching at your University?			
Yes	20 (13.6)	195 (98.4)	0.001
No	127 (86.4)	3 (1.6)	
4. Oncology should be taught as:			
A unified subject	93 (63.5)	113 (57.0)	NS
Part of other subjects including only basic knowledge in Oncology	54 (36.5)	85 (43.0)	

(*continued overleaf*)

Table 2. (*Continued*)

Question	1996 *n* (%)	2002 *n* (%)	*p*
5. In which of the following sectors do you believe there should be more emphasis given?			
Molecular biology	47 (31.7)	58 (29.2)	NS
Pathophysiology	44 (30.1)	63 (31.8)	NS
Pathology	37 (25.4)	51 (25.7)	NS
Clinical symptoms	96 (65.1)	119 (60.1)	NS
Diagnostic procedure	93 (63.5)	109 (55.0)	NS
Treatment	68 (46.0)	93 (46.9)	NS
Approach – Psychosocial support	87 (59.0)	149 (75.2)	0.003
Other (e.g., prevention, emergencies)	3 (1.6)	21 (10.6)	0.001

*If a student indicated insufficient or sufficient, multiple responses were possible within each category.

considered limited (p ranging from 0.005 to 0.001) as well as the time of clinical practice with cancer patients ($p = 0.001$).

Answers to the question regarding the method of instruction revealed that the majority of students believed that Oncology should be taught as a discrete subject (question 4 of Table 2). However, after the introduction of a more coordinated oncology-related syllabus in 2002, an increase was observed in the proportion of students supporting the idea of teaching oncology topics as part of other subjects (43% in 2002 versus 36.5% in 1996, $p > 0.05$).

In relation to oncology education in the curriculum and the emphasis given to it (question 5 of Table 2), no statistically significant difference was observed during the six years regarding molecular biology, pathophysiology, pathology, clinical symptoms, diagnostic procedures, and treatment. Surprisingly a demand was reported concerning the psychosocial support of patients ($p = 0.003$) and other cancer-related issues ($p = 0.001$) such as cancer pre-vention, oncologic emergencies, and ethical issues (e.g., euthanasia).

At the end of the questionnaire, space was left for comments and suggestions relating to the undergraduate education in oncology. The majority of students put emphasis on the development of pre-clinical experience in managing cancer patients and their families and creating better awareness of the psychosocial aspects, ethical issues, and behavioral prejudices during patient care.

Discussion

The present study sought to compare the findings of the first-step research work with those of the second-step study in an attempt to assess the impact of the changes on the undergraduate curriculum. Of note is that the results of the first study urged curriculum changes and facilitated the development of a more comprehensive cancer-related education in Oncology.

A hindrance to our survey was the fact that the compulsory subjects of both basic and clinical sciences in the medical curriculum are rather multidisciplinary and hence, it was quite difficult to determine the exact number of instruction hours related to Oncology. Nonetheless, the fact that the second study participants expressed the opinion that the level of undergraduate oncology education was satisfactory points out the upgrading of oncology education that occurred in the interim of the two studies. Indeed, the examination of the recent data has revealed that the increased number of Oncology specialists alongside the distribution of proper teaching oncology material have played a major part in the improvement. Moreover, the importance of cancer knowledge in the curriculum has been highlighted and students have realized the need to familiarize themselves with cancer-related topics in preparing for their future career.

According to the results of the present study, it becomes obvious that a major issue regarding cancer education relates to the extensive fragmentation of the

basic and clinical sciences. Additionally, excessive emphasis is put on molecular biology, pathology, pathophysiology and clinical topics, whereas the importance of interpersonal skills and cancer prevention receives rather little attention. On the other hand, there is a significant increase in the number of students who support the idea of being taught Oncology as a separate subject in the curriculum and not merely as a part of other subjects. Tutorials and lectures are beyond doubt a good way to establish the theoretical basis of education and clinical practice and provide the rationale for methods, aims, and objectives of cancer-related education. However, several surveys have shown that students are emotionally prepared and welcome the early clinical exposure in a range of settings (Custers & Cate, 2002; McLean, 2004), and the importance of having cancer-related topics as either compulsory or elective courses taught by oncology specialists has been highlighted (Finlay *et al.,* 1998; Bruera *et al.,* 2000). Such a view could be attributed to the students' wish to redress the balance among the subjects of the curriculum, where a coordinated multidisciplinary tutorial approach appears as a prerequisite for the successful *total care* of cancer patients in the future (Grassi *et al.,* 2000; Iconomou *et al.,* 2002).

Additionally, students should try to overcome various ethical and behavioral prejudices (Birgegard & Lindquist, 1997; Leaviss, 2000; Goldie *et al.,* 2002). At the pre-clinical stage, education should be as realistic and comprehensible as possible, combining theory with practice. Our results confirm that current medical education still pays lip service to teaching communication skills, as there is limited room for such a process in the curriculum. Communication and medical education issues become all the more crucial for students who are about to deal with critically ill patients. Treating cancer patients is, beyond doubt, a stressful task, which requires special skills and sensitivity (Iconomou *et al.,* 2002). Oncologists repeatedly deliver bad news and are constantly confronted with suffering and death (Iconomou & Kalofonos, 1999). There is thus a pressing need to include constructive and influential courses in the undergraduate curriculum to teach future doctors the art of caring for the patient. Far from the notion that communication is a talent or the product of experience, there is now a wealth of evidence to suggest that communication skills can be taught and there is room for improvement even in the interpersonal behavior of qualified doctors (Rutter *et al.,* 1996; Maguire, 1999; Olm-Shipman *et al.,* 2003; Shapiro *et al.,* 2004; Gysels *et al.,* 2005).

However, in drawing overall conclusions there are two points to make about our research. First, both studies were based of necessity on a cross-sectional design, thus precluding the ability to answer whether there were any changes in the way students care for cancer patients over time. Second, due to financial and logistic restrictions, we did not include any qualitative methods such as focus group discussions to follow up on points raised in the questionnaire data. Future prospective and longitudinal studies using both quantitative and qualitative methods should produce definitive findings.

Overall, our data demonstrate that the curricular improvements are mainly attributed to the increased number of specialized oncology staff, their coordination with other basic and clinical scientists, as also the increased focus on research issues. Nevertheless, despite the progress, there is still a need for further improvements in the students' undergraduate education so as to meet current demands.

To conclude, oncology education in Greece still remains disease-oriented in its approach. Therefore, the target of undergraduate education should not merely be concerned with the quality of medical knowledge, but also with the modification of the attitudes towards cancer prevention, a psychosocial approach to patients, and ethical issues and dilemmas. In order to accomplish such a multifaceted oncology education, both theoretical and practical courses should be optimally combined. Although the overall misconception about cancer in our society is not exclusively encountered by medical schools and students, the medical culture could dissolve biased stereotypes and negative attitudes and behavior towards malignant disease.

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