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Original article

Bioethics in Italian Medical and Healthcare Education. A Pilot Study

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Summary. *Background and aim of the work:* Bioethics is relevant in healthcare and medical schools. However, unlike other foreign countries, its teaching in Italy has only been recently introduced, it is less extensively offered and no academic standards for bioethics education have been established. This research aims at understanding whether university bioethics courses attendees appreciate and consider teaching strategies to be effective with the objective of validating a coherent didactic approach to the discipline and stimulate further discussion on ways to improve it. *Methods:* A standardized survey was administered to 1590 students attending undergraduate degree programs in medicine and healthcare at four Italian universities. *Results:* The majority of interviewees (92.5%) had an interest in bioethics, considered it to be important for any life-sciences-related program (73.5%) and most healthcare (77.2%) and medical students (69.2%) suggested its teaching should be included in their curricula and made mandatory (66.3%) and continuous (57.7%), given its usefulness in clinical practice. Students consider bioethics as a care-integrated practice and appreciate teaching methods where it is integrated into clinical cases. Conceptual specificity and interdisciplinarity may affect the learning process and contribute to enhance students' analytical skills. *Conclusions:* Italian bioethics education should be revised to meet students' expectations and preferences. Its complex, multi-disciplinary and transversal nature suggests bioethical education to be flexible and integrated among different disciplines, thus stimulating a broader critical capacity through cases studies and other interactive teaching methods for helping students better deal with bioethics-inherent difficulties and improve the learning process. (www.actabiomedica.it)

Key words: bioethics, medical and health curricula, teaching of bioethics, medical education, teaching

Introduction

Bioethics is of significant relevance in healthcare and medical schools as students need to develop skills they may need for identifying, assessing and addressing ethical issues in their future clinical practice (1-2). Although there is broad consensus that future physicians and health professionals should be trained in clinical ethics (3), many disparities in medical academic programs exist with regard to the number of hours and to

the instructors' disciplinary backgrounds (4). How the topic should be taught, who should teach it and what exactly curricula should include are relevant to the international debate (5).

Unlike many foreign countries (i.e. UK and USA) which have developed specific didactic methodologies over years of experience, the teaching of bioethics in Italy has only been recently introduced in medical curricula, its teaching is less extensively offered and no academic standards and/or guidelines for bioethics education have been established (6-10).

Hence, the educational challenge that health-related curricula need to face is to identify the most effective didactic methods for young doctors' and healthcare professionals' education.

Complexity arises from the necessity to combine the three core aspects of basic didactic triangulation (11), namely (a) bioethical contents, (b) subjects and (c) professional context. Bioethical contents are concerned with the issues that are central to the field; subjects are referred to the individuals in their late adolescence-adulthood educational phase; and professional context deals with healthcare, health- and illness-related activities within hospital contexts. In the light of the three instances guiding didactic planning, three priorities shall be considered:

(a) bioethical contents include specific transversal competences such as critical thinking, ability to cross disciplinary borders, social skills for inter-professional debate, emotional competences and understanding of socio-cultural aspects;

(b) subjects in their higher educational phase are aged 19-30. Therefore, their learning modalities are characterized by adult learning styles rather than evolutionary ones, thus also influencing teaching methods;

(c) the professional context focuses attention on specific health- and illness-related matters by operatively involving healthcare professionals.

The didactic response elaborated for these needs employs immersive, meta-cognitive and collaborative models and practices which characterize instructors' teaching actions (12). Attention is chiefly focused on didactic approaches which stimulate the lack of uniformity and the problematic nature of ethics responses such as seminar small-group discussion on clinical cases for favoring debate, guided reflection through logical organizers such as maps and non-sequential methods as well as video supports.

In order to investigate the strengths and weaknesses of the current bioethics didactic methods in medical curricula, we performed a pilot study concerning perceptions and experiences regarding the teaching of bioethics among Italian undergraduate students.

The research has taken up the challenge of understanding whether university bioethics courses attendees appreciate and consider teaching strategies to be effective with the aim of validating a coherent didactic approach to the discipline over time and to stimulate further discussion on how to improve its teaching modalities.

Methods

We surveyed students from four Italian universities located in different geographic areas: Sapienza University of Rome, University of Genoa, University of Verona and Insubria University of Varese. This choice was based on the interest of bioethicists working within the aforementioned academic institutions.

We developed a survey with closed and semi-closed questions aimed at investigating students' opinions and experiences about their educational training. The preliminary draft was submitted to a panel of experts in bioethics, history of medicine, clinical research and statistics and modified according to their suggestions. The questionnaire was composed of 28 items exploring students' level of interest, motivation and attitude towards the teaching of bioethics (Table 3), students' training needs (Table 4), didactic organization, methodologies and training criticalities (Table 5).

The questionnaire was self-administered, anonymous and filled out on a voluntary basis.

The survey was approved by the Ethical Committee of the Region of Liguria (n. P.R. 190REG2015, 7 July 2015).

Participants

The survey population was made up of male and female students ranging from 18-30 years of age enrolled in undergraduate medical and healthcare-

related courses in the above mentioned universities and attending bioethics during the Academic Year 2015/2016. (Tables 1 and 2).

Statistical analysis

Response rates (%) for each question were indicated and the percentage of multiple-choice questions was calculated on the total of respondents' answers. Data were summarized in Tables 3, 4 and 5.

Results

Data analysis reveals that nearly all students (92.5%) have a high interest towards ethical matters, regardless of their educational track. Ethical issues are deemed very important (73.5%) across all healthcare professions, thus showing a certain degree of maturity, awareness and responsibility, as bioethics is perceived as a personal, professional and social necessity rather than a simple educational step. Hence, adult-learning participation methods (13) privileging involvement, debate and co-construction of knowledge are preferred.

Most of the students in our sample (92.5%) have an interest towards ethical issues and consider them to be important to any life and health sciences-related profession (73.5%). End-of-life issues (pain therapy, palliative care and euthanasia) are considered to be the most interesting topics regardless of the participants' educational path (68%). Less than half of the students (45.3%) would attend an additional optional teaching activity on this subject, while many (35.2%) are undecided. As for educational requirements, 77.2% of students attending health professional courses and 69.2% of medical school students report that the teaching of

Table 1. Degree courses of Medicine and Surgery and Health Professions of the recruited Universities

Course/Schools	Universities				
	Genova n (%)	Insubria n (%)	La Sapienza n (%)	Verona n (%)	Total n (%)
Health care			36 (3.4)		**36 (2.3)**
Biotechnology	24 (8.8)				**24 (1.5)**
Physiotherapy		31 (13.2)	16 (1.5)		**47 (3.0)**
Dentistry and Dental Prostheses/Dental Hygiene and Tecn. Cardiovascular Perfusion	17 (6.2)	30 (12.8)			**47 (3.0)**
Nursing		33 (14.0)	420 (39.6)		**453 (28.5)**
Pediatric Nursing			11 (1.0)		**11 (0.7)**
Rehabilitation Sciences Health Professionals				21 (100)	**21 (1.3)**
Medicine and Surgery	233 (85.0)	139 (59.1)	378 (35.7)		**750 (47.2)**
Obstetrics			29 (2.7)		**29 (1.8)**
Rehabilitation Sciences of Health Professionals/ Speech Therapy/ Occupational Therapy/ Evolutionary age neuroscience and psychomotorism			89 (8.4)		**89 (5.6)**
Audiometric and Audioprosthetic Techniques/ Neurophysiopathology/ Neurophysiopathology Techniques/ Diagnostic Techniques/ Techniques Cardiopulmonary Pathophysiology/ Psychiatric Rehabilitation Techniques/ Biomedical Laboratory Technician			78 (7.4)		**78 (4.9)**
Undeclared		2 (0.9)	3 (0.3)		**5 (0.3)**
Total	**274**	**235**	**1060**	**21**	**1590**

Table 2. Sample Demographics

Institution	Gender	n (%)	Age	n(%)
University of Genoa	274 (17.2)			
	Female	164 (59.9)	<20	7 (2.5)
	Males	107 (39.0)	20 - 30	261 (95.2)
	Undeclared	3 (1.1)	31 - 40	2 (0.7)
			>40	
			Undeclared	4 (1.5)
University of Insubria - Varese	235 (14.8)			
	Female	148 (63.0)	<20	106 (45.1)
	Males	85 (36.1)	20 - 30	126 (53.6)
	Undeclared	2 (0.9)	31 - 40	1 (0.4)
			>40	
			Undeclared	2 (0.9)
Sapienza University - Rome	1060 (66.7)			
	Female	709 (66.9)	<20	7 (0.7)
	Males	345 (32.5)	20 - 30	919 (86.7)
	Undeclared	6 (0.6)	31 - 40	39 (3.7)
			>40	18 (1.7)
			Undeclared	77 (7.2)
University of Verona	21 (1.3)			
	Female	17 (81.0)	<20	
	Males	4 (19.0)	20 - 30	10 (47.6)
	Undeclared	-	31 - 40	6 (28.6)
			>40	5 (23.8)
			Undeclared	-
Total	**1590 (100)**			

ethical issues should be part of all types of health curricula (if possible, within the framework of integrated courses in 68.7% of cases). In addition, the majority of students suggest to make the teaching of bioethics mandatory (66.4%) and continuous (57.8%).

From a didactic perspective, these data highlight two crucial aspects. In the first place, the awareness of bioethical issues developed throughout the educational track may be observed. Students consider these matters to be relevant to any healthcare profession and the need to be mandatorily and continuously trained emerges in 2/3 of the cases. In the second place, bioethical issues are not considered as theoretical models to be learned within a specific educational framework but rather as cultural and existential elaborations to be developed all throughout one's professional life (continuing education was indicated by 57.8% of students).

A high percentage of interviewees declare that the teaching of bioethics is either "high" or "average" for their education (90.5%) as well as for taking care of and treating patients and/or other living beings (75.2%). 81.7% further observe that bioethics is crucial for taking care of the needs of suffering patients no less than other disciplines. Students do not consider bioethics as an on-call competence but rather as a care-integrated practice. Hence, in our view, students appreciate teaching methods where bioethical arguments are integrated into case studies, especially when they emerge from the analysis of clinical rather than purely ethical problems.

Commitment to learn bioethics is high (71.11%). 25.4% declare not to have encountered any obstacles in learning bioethics, while the remaining students find the discipline to be complex due to its concep-

Table 3. Students' interest, motivation and attitude towards the teaching of bioethics

	N	%
Levels of interest towards Bioethics		
Very relevant	352	22.1
Relevant	614	38.6
Rather relevant	505	31.8
Scarcely relevant	87	5.5
Not relevant	19	1.2
I don't know	10	0.6
Missing	3	0.2
Topics considered to be interesting regardless of the training course		
End of life	1081	68.0
Voluntary interruption of pregnancy	785	49.4
Assisted procreation	556	35.0
Religion and Patient relationship	511	32.1
Change gender identity	506	31.8
Consent/dissent to treatment	505	31.8
Human Experimentation	505	31.8
Interest in the frequency of optional teaching activity of Bioethics		
Yes	721	45.3
No	299	18.8
I don't know	560	35.2
Missing	10	0.6
Professions in which students consider the teaching of Bioethics important		
Doctor	258	13.7
Dentist	36	1.9
Nurse	124	6.6
Veterinary	59	3.1
All professions	1382	73.5
I don't know	18	1.0
Missing	3	0.2
Usefulness level of Bioethics for taking care of and treating patients and/or living beings		
High	432	27.2
Average	763	48.0
Scarce	340	21.4
None	28	1.8
I don't know	19	1.2
Missing	8	0.5
Usefulness level of Bioethics to take care of suffering persons		
Yes	1299	81.7
No	88	5.5
I don't know	178	11.2
Missing	25	1.6
Usefulness of Bioethics for the development of critical reflections		
High	286	18.0
Average	892	56.1
Scarce	268	16.8
None	90	5.7
I do not answer	27	1.7
Missing	27	1.7

(continued)

Table 3 *(continued)***.** Students' interest, motivation and attitude towards the teaching of bioethics

	N	%
Usefulness of Bioethics for the development of one's own critical capacity		
High	275	17.3
Average	908	57.1
Scarce	263	16.5
None	68	4.3
I do not answer	46	2.9
Missing	30	1.9
Identification of ethical issues in clinical practice?		
Yes	703	44.2
No	303	19.1
I don't know	101	6.3
Missing	483	30.4

tual (19.2%), terminological and linguistic specificities (15.0%) and to its interdisciplinary nature (17.7%).

Results show that didactic activities do not seem to be affected by the teachers' religious beliefs (48.7% and 22.5% of students reported either "none" or "scarce" respectively). The controversial nature of bioethical issues and the lack of univocal solutions do not represent a criticality for 61.2% of students. It rather appears that this feature is understood by students as a specifically inherent aspect of ethical discourse. It is a matter of content not as much arising from transmissive didactic methods but rather from the interactive, reflective and immersive methodologies experienced over class.

The effectiveness of these didactic methods is confirmed by the students' appreciation of specific learning experiences. Small-group seminars, clinical cases discussions, project work and the use of practical cases are indicated as the most appropriate teaching methodologies for learning bioethics.

These interactive, experiential and reflective teaching methods represent 75% of students' preferences. The suggestion emerging from students' answers reinforces the focus on interactive and meta-cognitive didactic models as the most effective ones for learning bioethics.

Moreover, 46.5% of students report that oral examinations are the most appropriate evaluation methodology for assessing the acquired level of knowledge, while 37.2% express preference for multiple-choice quizzes.

Appreciation for the co-constructive and elaborative didactic model is also confirmed by the broad preference (51%) for audiovisual material and evaluation of real medical records.

The correlation between theoretical education and clinical practice during their training is perceived by students as "high" in only 5.4% of the cases, "average" in 30.8%, "scarce" in 23.9% and "none" in 6.2%. 29.1% either did not answer this question or were undecided. Furthermore, the majority of students highlight the need for a specific bioethics training for instructors (82.5%). The need for this training is judged to be a requirement for all professionals operating in the fields of health and life sciences (86.8%). 32.9% report about instructors and professionals operating in the fields of health and life sciences with a low level of interest/awareness towards bioethics and 83% show a positive tendency towards the importance of continuing education and professional learning.

Such choice reveals how students consider bioethics as a competence inherent to one's professional identity rather than a simple set of theoretical principles to be memorized. This entails the need to promote a significant, in-depth and context-related learning method.

44.2% of students report about cases raising ethical issues during their clinical practice. 74.4% declare that the teaching of bioethics helps them develop critical thinking and analytical skills.

Table 4. Training needs

	N	%
Preference for compulsory or elective bioethics teaching		
Compulsory/Optional	500	31.4
Compulsory	1054	66.4
Absent	21	1.3
Missing	15	0.9
Relevance of bioethics for vocational training		
High	779	49.0
Average	661	41.5
Scarce	102	6.4
None	20	1.3
I don't know	25	1.6
Missing	3	0.2
Topics that the student considered to be interesting for his/her own training course		
End of life	775	48.7
Voluntary interruption of pregnancy	595	37.4
Refusal of medical treatment	550	34.6
Informed Consent/Dissent	542	34.1
Diagnosis and prognosis communication	531	34.1
Assisted procreation	424	26.7
Religion and Patient relationship	411	25.8
Change gender identity	310	19.5
Evaluation of the amount of hours dedicated to the teaching of Bioethics		
More than enough	341	21.4
Barely sufficient	727	45.7
Just enough	323	20.3
Not enough	145	9.1
I don't know	44	2.8
Missing	10	0.6
Evaluation of study commitment		
Excessive	81	5.1
Appropriate	1130	71.1
Poor	197	12.4
I don't know	144	9.1
Missing	38	2.4
Need for a specific bioethics training for instructors		
Yes	1312	82.5
No	248	15.6
Missing	30	1.9
Need for specific bioethics training for professionals working in the field of health and life sciences		
Yes	1380	86.8
No	179	11.3
Missing	31	1.9
Need for continuing bioethics education for professionals working in the field of health and life sciences		
Yes	1320	83.0
No	238	15.0
Missing	32	2.0

Table 5. Didactic organization, didactic methodologies and criticalities

	N	%
Preference in the Academic placement of didactic of bioethics		
Health Professions Courses (Health Care, Nursing, Rehabilitation Sciences,…)	1228	77.2
Medicine and Surgery/Dentistry	1100	69.2
Medical Specialization Courses	572	36.0
Postgraduate Courses	431	27.1
Missing	33	2.1
Preference of bioethics teaching within integrated courses		
Yes	1093	68.7
No	442	27.8
Missing	55	3.5
Preferences of bioethics courses structure		
Continuing education	918	57.8
During a single specific year	594	37.3
Missing	78	4.9
Difficulties encountered in learning bioethics		
None	430	25.4
Language / terminology	254	15.0
Conceptual	326	19.2
Relating to the interdisciplinarity of matter	300	17.7
No more than other topics	361	21.3
Missing	24	1.4
Perception of ideological and religious positioning		
High	38	2.4
Average	209	13.1
Scarce	358	22.5
None	775	48.7
I don' t know	192	12.1
Missing	18	1.1
Difficulties related to the controversial nature of bioethical issues		
High	137	8.6
Average	318	20.0
Scarce	544	34.2
None	430	27.0
I don' t know	130	8.2
Missing	31	1.9
Appropriate methodologies for the teaching of bioethics		
Lectures	614	20.2
Small group seminars on specific issues or "bioethical cases"	695	22.9
Laboratories simulating bioethics consultancy	353	11.6
Preparation of targeted project work	231	7.6
Case Discussion	689	22.7
Frequency in hospitalization facilities	304	10.0
Other	31	1.0
Missing	119	3.9

(continued)

Table 5 *(continued)***.** Didactic organization, didactic methodologies and criticalities

	N	%
Appropriate material for learning bioethics		
Specific manuals, textbooks etc ...	374	15.8
Websites	136	5.7
Audiovisual material provided by the teacher on *aulaweb*	489	20.7
Integration of the indicated materials	586	24.8
Folders with practical cases to evaluate	745	31.5
Other	19	0.8
Missing	17	0.7
Most appropriate examination methods		
Multiple-choice test	657	37.2
Oral test	820	46.5
Written topic	210	11.9
Other	36	2.0
Missing	41	2.3
Correspondence between bioethics courses contents and clinical practice		
High	86	5.4
Average	489	30.8
Scarce	380	23.9
None	98	6.2
I don't know	75	4.7
Missing	462	29.1
Low consideration of bioethics by instructors/professionals working in the health field		
Yes	524	32.9
No	1017	64.0
Missing	49	3.1

Discussion

The widespread interest in bioethics among students of all types of health-related undergraduate courses reveals a growing awareness of the importance of this field of study and the consequent need to use appropriate teaching tools. The particular attention towards end-of-life matters can be related to the progresses of medical sciences in resuscitation techniques and to the increasing media exposure of dramatic cases having a strong emotional impact on people (14-16). Students' interest towards end-of-life could also indicate their concern about facing suffering and death (17-19). Continuous development of educational activities on these issues should be carefully taken into consideration with particular regard to the acquisition of specific emotional skills (20-21).

Students' sensitivity towards ethical issues in health professions also arises from the observation that almost half of the interviewees claimed witnessing cases raising ethical issues during practice and training activities. This sensitivity does not depend on the specificities of the students' actual professional area. A high percentage of students claims to be aware that ethical issues are of common relevance to any profession in the field of life and health sciences and that bioethics teaching is relevant to any professional training. Ethical sensitivity can both be attributed to a different kind of relationship with the patient (from paternalism to the respect of patient autonomy) and to a process of intellectual growth along with the ethical and legal responsibilities that have characterized health professions over recent years.

The awareness of the transversality of the ethical dimension in all areas of the bios is certainly a positive outcome. Looking at bioethics within the context of complexity implies the need to enhance the connections existing among the different dimensions

of bioethics (i.e. medical, animal and environmental ethics) (22-24). The transversality of bioethics is also confirmed by the students' recommendation to include the teaching of bioethics within integrated teaching courses. This choice indicates that bioethics is considered as an essential element of any healthcare professional training. These data also suggest the possibility to share educational bioethics courses among students belonging to the various disciplines of the medical and health care areas, at least on specific topics. This training policy could also stimulate inter-professional integration, thus promoting interdisciplinarity and teamwork habits.

According to the recognized relevance of bioethics, a very high percentage of interviewees highlights the need for a specific bioethics training for all teachers and practitioners, be they physicians or health professionals. The importance of continuing education is also perceived as a fundamental requirement by a high percentage of students . However, this necessity does not always coincide with due attention on the part of the Italian academic system, which still does not recognize this subject as an essential component of medical and healthcare students' *curricula* (25).

The indications emerging from the research show how students consider professional-context-related didactic methods to be more effective. Students appreciate learning through either real or simulated concrete situations by elaborating discussion- and debate-based competences through interaction with peers and bioethics instructors. Bioethical competence is not a merely declarative knowledge but it is made up of practical aspects, plurality of choices and willingness to discuss. According to students, these qualities are part of professional identity continuing education. Thus, the continuing education method shall be encouraged.

At an educational level, this implies rethinking traditional curricula in order to enhance ethical training and to create educational activities aimed at stimulating the sharing and discussion of clinical cases ethical aspects (26-28).

A large number of students acknowledged the utility of bioethics teaching for taking care of and treating patients and/or other living beings and supported the idea of pushing towards mandatory courses and/or additional optional teaching activities on the issue. This information suggests a growing students' awareness of the relevance of bioethics as an essential part of health professionals' training. The extremely high result (81.7%) indicates that the teaching of bioethics could effectively contribute, like other scientific fields of study, to offer appropriate care to suffering persons. This view is also confirmed by data showing evidence that the teaching of bioethics can lead to critical reflections not formerly considered otherwise.

Although the importance of bioethics is widely recognized, the understanding of this discipline is often considered as problematic and complex, in particular with regard to the learning process. The need to define and address ethical dilemmas arising from clinical practice may involve philosophical and anthropological concepts (the meaning of life and death, human dignity, definition of subjective health, disease and therapy) that do not always fit the scientific nature of medical curricula (29). Students attending courses in the healthcare area tend to be more pragmatic and not keen to understand disciplines such as medical ethics (30).

The heterogeneity of such data may depend on several variables, including the size of the University, (a) the type of course, (b) the teaching mode and (c) the methods and tools used during lessons that are generally left to academics' individual discretion.

(a) The type of course acquires relevance in relation to the different students' maturity and experience degrees. Italian Medical Schools adopting a bioethics course are used to spread the teaching over several years. It is reasonable to assume that older students have more confidence in this subject and are therefore able to better understand the complexity and delicacy of ethical topics.

(b) Students' learning can also be conditioned by the adopted teaching approach, as bioethics is characterized by a plurality of approaches and interdisciplinarity (31).

(c) Courses structure and educational methods may also affect learning outcomes (32). The majority of students opted for continuing bioethics education, highlighting the necessity to spread this discipline over several years. However, a high percentage of students in our sample declared that a single course may be as useful for learning ethical issues. The choice about the optimal setting is a complex matter. A single course

would likely provide a faster and more immediate learning, while continuing education would guarantee the transversality of bioethics in relation to other disciplines.

As for educational methods, data analysis shows that practical application of ethical issues increases interest and curiosity among students. Scientific studies argue that case discussion can be a good teaching method due to its proximity to the clinical reality (33-34). The discussion of clinical cases not only improves ethical issues understanding, but also help students to more easily deal with the difficulties inherent to the interdisciplinary nature of bioethics (35). By adopting this approach, students may develop new skills for addressing the problems of suffering people and the issues related to the ethical-social responsibility of the therapeutic action. According to the literature, learning in small-group tutorials and interactive seminars is particularly appreciated by students for developing ethical problem-solving skills (36-37).

Students probably understand the ideal role that bioethics should have in clinical practice: not just a sterile teaching merely aimed at learning theoretical notions, but rather at providing skills and tools to develop an autonomous moral judgment and critical consciousness. This awareness more clearly emerges from students' perception of the correspondence between recommendations being taught in bioethics courses and the actual behaviours of health practitioners during practical activity or apprenticeships. While 31.5% of students reported a suitable degree of correspondence, 24.8% found some criticalities. These data confirm that, despite the difficulties encountered, students have developed a good critical ability, even in judging the adequacy and the usefulness of bioethics courses.

The higher preference for oral examinations allows students to more thoroughly ascertain the actual understanding of what they have learned and to explain their position. However, the equally high percentage of students favoring multiple-choice tests is not surprising, given the popularity of this evaluation method in the medical field. Nevertheless, as argumentative abilities are core to bioethics, multiple-choice tests are not deemed appropriate for the discipline. On the other hand, the often controversial nature of bioethical issues has not been reported as a problem by students.

Strengths and Weaknesses

Although the present investigation provides useful insights, few limitations need to be considered. In the first place, the students sample was limited to four Universities located in the Central and Northern parts of Italy. Therefore, it does not represent the student population of the whole country and the results may be somewhat limited in generalizability. In the second place, the use of self-reporting instruments with its problems and limitations should not be overlooked (38). Despite these limitations, this is the first study describing Italian students' needs and perceptions towards the teaching of bioethics and the findings can contribute to the existing literature.

Conclusions

Health professionals represent the first recipients of patients' needs and concerns (39-40). This study shows a positive attitude and high level of interest of students towards the teaching of bioethics . The multidisciplinary and transversal nature of this discipline makes the teaching of bioethics more complex. This complexity, whether properly addressed, does not affect students' learning and suggests to base bioethical education upon flexibility and integration among different disciplines, thus stimulating a broad critical capacity. Special attention should be devoted to cases studies and other interactive teaching methods as measures to help students to better deal with the difficulties inherent to this study and improve the learning process.

Ethics Approval: The survey, anonymous and voluntary, has been directed by the Faculty of Medicine of Genoa and approved by the Ethics Committee of the Region of Liguria (n. P.R. 190REG2015, 7 July 2015).

Authors contributions: VG, GM, MP, GA, PC, SB, AAG, FDS and RC contributed to the conception and design of the study. MG, SP and RC carried out the acquisition of data, contributed to the interpretation of the results and wrote the first and subsequent drafts. IB and EM collaborated at implementing the project, especially contributing to the literature search and to acquisition and interpretation of data. IB Agreement to be accountable for all aspects of the work in ensuring that

questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. DFM and LM provided statistical expertise and analysis for the collected data, provided input into the design of the study and of the questionnaire. RC coordinated the whole work project. All authors provided critical feedback and helped shape the research, analysis and manuscript.

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