Perceptions on Bioethical Issues among Postgraduate Basic Medical Sciences Students of Mashhad University of Medical Sciences, Iran

Soluti SS[1], Ebrahimi M[2], KarimiMoonaghi H[3], Jamialahmadi K[4, 5]*

[1] Dept. of Modern Sciences and Technology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
[2] Dept. of Islamic Education, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
[3] Dept. of Medical Education, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
[4] Biotechnology Research Centre, Mashhad University of Medical Sciences, Mashhad, Iran.
[5] Dept. of Medical Biotechnology, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Corresponding Author: E-mail: jamialahmadikh@mums.ac.ir

Abstract

Background and Objective: Bioethics is a multidisciplinary subject which has been of major significance to biotechnology researchers and related fields. The aim of this survey was to assess knowledge and attitudes of postgraduate students of Medical Faculty regarding bioethical issues.

Materials and Methods: This cross-sectional study was carried out among the postgraduate basic medical sciences students of Faculty of Medicine in Mashhad University of Medical Sciences, Mashhad, Iran. A self-administered questionnaire consisted of 42 questions was designed to assess knowledge and attitudes of postgraduate students on bioethical issues.

Results: A total of 107 postgraduate students (out of 114), including 73 Master (MSc) and 34 Doctoral (PhD) students filled out the survey (93.8%). Only 17.6% of PhD students had a good knowledge of bioethics whereas none of the MSc students fell within this category. On average almost 68.5%of the respondents were familiar with the term "Bioethics". About 95.7% of MSc students reported that no academic courses were offered in bioethics whereas 54.5% of PhD students were able to take academic courses in the field. The results also showed that about 85 % of the respondents generally believed that it was necessary to increase their knowledge of bioethics.

Conclusion: Although the postgraduate students were familiar with the term “Bioethics”, their awareness about bioethical issues was not very desirable. Results showed that the students had a high level of motivation for increasing their general knowledge in the field, so the necessity of designing appropriate courses on bioethics in university curricula should be reinforced.

Keywords: Bioethics, Medical faculty, Perceptions, Postgraduate Students

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOR: 20.1001.1.22519521.1395.9.22.11.0]

Introduction

Emerging biological advances in recent years have been associated with social and environmental issues in global aspects. Bioethics is a multidisciplinary field in which many different countries are involved around the world due to their increasing advances in biological sciences and technologies (1).

In ancient Iran, medicine and patients' rights have been tied strongly together which could be revealed in some historical resources. Also special attention to ethics is seen in physician's practices, teachings and manuscripts (2). Due to the cultural and religious reputation of the great Iranian physicians and chemists, Avicenna (981-1037 CE), Razi (865-925 CE) and others, our country has had a significant historical bioethics textbook documentation (3, 4).

In recent decades, bioethical issues have been discussed widely by biomedical and law researchers, policy makers and other different

organizations in Islamic Republic of Iran (2). As the result of the above-mentioned efforts, laws on organ and embryo donation and also therapeutic abortion have been approved by government authorities (5-7).

On the other hand, bioethics committees should be established in all universities and biomedical research centers in Islamic Republic of Iran as a requirement of Ministry of Health and Medical Education (8) and, consequently, some of these committees have been established in over 85 research centers which work on biotechnology, molecular and cellular biology and other related fields. These committees are also developing increasingly in other universities and research centers (8).

Mashhad University of Medical Sciences, which was officially established in 1949, is located in the North-East of Iran. The university currently has 9 faculties, 44 hospitals, and 120 rural and 125 urban health centers. In Faculty of Medicine, there are 14 fields for Master of Science (MSc) degree, 10 fields for Doctor of Philosophy (PhD) degree and one field for M.P.H degree.

Department of Medical Ethics in Faculty of Medicine in Mashhad University of Medical Sciences assumes responsibility for teaching ethical issues to medical students, but there is no confirmed and comprehensive educational program with a focus on bioethical subjects for the majority of postgraduate students who are studying in different fields related to basic medical sciences in the faculty.

The aim of this survey was to assess general knowledge and attitude of postgraduate students of Mashhad Medical Faculty in relation to different aspects of bioethical issues, in an attempt to sensitize and draw attention of medical education policy makers of Mashhad University of Medical Sciences to the importance of teaching bioethics to students.

Materials and Methods

This cross- sectional study was carried out among MSc and PhD students of Faculty of Medicine in Mashhad University of Medical Sciences, Mashhad, Iran. A self-administered questionnaire was developed, consisted of 46 questions including demographic data and also knowledge and attitudes questions.

The initial part of the questionnaire consisted of respondents' demographic data (age, gender, students field of study and level of education).The other parts (knowledge and attitude parts) included 42 questions for evaluating familiarity of students with bioethics and their general information on bioethical issues like organ donation, biobanking, stem cells, cloning and genetic engineering products.

The questionnaire was validated by a pilot survey which was distributed among academic researchers who were experts in biotechnology, human genetics and other related fields. Test-retest reliability was performed by participation of 40 subjects (pilot sample) from the study subjects, with two weeks interval, yielding a correlation coefficient of 0.8.

The questionnaire was distributed to 114 postgraduate students of Mashhad Medical Faculty and from this initial pool 73 MSc and 34 PhD students responded to the questionnaire. Students from different majors in basic medical sciences such as medical biotechnology, molecular medicine, genetics, medical education, parasitology and mycology, biochemistry, nutrition, anatomy, medical physics and physiology participated in the survey voluntarily and confidentially. The reason and importance of the study were previously explained to them. The collected data was organized in Microsoft Excel and subsequently statistical analysis was performed using SPSS software. Results were

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOR: 20.1001.1.22519521.1395.9.22.11.0]

reported in frequencies and percentages that are presented in 5 Tables.

Results

Demographic characteristics of the respondents

A total of 107 postgraduate students, including 73 MSc and 34 PhD students completed the survey and response rate obtained 93.8 %, which mostly included female students among both the MSc (67.1%) and PhD (53.1%) groups. Demographic characteristics of the respondents are shown in Table 1.

Table 1: Demographic characteristics of postgraduate students who participated in the study.

Characteristics	Educational status	Group	F	(%)
Age	M.Sc. students	22-26 years	59	84.3%
		27-31 years	9	12.9%
		32-37 years	2	2.8%
		Total	**70**	**100 %**
	Ph.D. students	25-28 years	10	25.0%
		29-32 years	17	53.6%
		33-41 years	7	21.4%
		Total	**34**	**100 %**
Gender	M.Sc. students	Male	23	32.9%
		Female	47	67.1%
		Total	**70**	**100 %**
	Ph.D. students	Male	16	46.9%
		Female	18	53.1%
		Total	**34**	**100 %**
Academic field	M.Sc. students	Nutrition	14	20%
		Genetics	14	20%
		Anatomy	8	11.4%
		Biochemistry	11	15.7%
		Parasitology and Mycology	3	4.3%
		Physiology	5	7.1%
		Medical Education	15	21.4%
		Total	**70**	**100 %**
	Ph.D. students	Molecular Medicine	14	42.4%
		Medical Biotechnology	13	39.4%
		Medical Physics	4	12.1%
		Physiology	2	3.0%
		Anatomy	1	3.0%
		Total	**34**	**100 %**

F= Frequency

Over 84 % of MSc students were 22- 26 years of age (mean age = 25.27±2.56) while the majority (53.6%) of PhD respondents were between 29 to 32 years old (mean age = 31.21±4.36). 67% of MSc students and 53.1% of PhD students were female whereas 32.9% of MSc students and 46.9% of PhD students were male.

Most of the MSc respondents (61.4%) were studying in three academic fields including medical education, genetics and nutrition, and as the results revealed 80% of PhD

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOR: 20.1001.1.22519521.1395.9.22.11.0]

respondents were studying molecular medicine and medical biotechnology which indicated their relevant relationship with bioethical issues.

Postgraduate students' awareness level

In order to assess the awareness level of the students on bioethics and related fields, their responses were placed in four levels from "Don't know" to "Know a great deal" (Table 2). More than 60% of postgraduate students were only familiar with bioethics definition, but their awareness on other related aspects of bioethics had shown better exposure to the subjects. For example, more than 80% of respondents reported that they were well informed on organ transplantation. The level of understanding of organ transplant and stem cell research among PhD and MSc students were relatively similar (85.3% vs. 85.7% and 80% vs. 85.3%, respectively), while more differences in other aspects of the issue of bioethics like biobanking, cloning, gene therapy and genetically engineered products were observed among them. Also the awareness of MSc students on biobanking (49.3%) was the least among other aspects of bioethics which showed that they had little information about it. The results of the survey revealed that overall awareness of PhD students was higher in all aspects of bioethics in comparison with the MSc students.

Table 2: Participant's awareness on Bioethical Issues

Subject	Educational status	Don't know Number (%)	Know just a little Number (%)	Know a far amount Number (%)	Know a great deal Number (%)
Bioethics	M.Sc. students	26.0 (37.1%)	44.0 (62.9%)	0.0 (0.0%)	0.0 (0.0%)
	Ph.D. students	3.0 (8.8%)	25.0 (73.5%)	0.0 (0.0%)	6.0 (17.6%)
Organ transplant or organ donation	M.Sc. students	6.0 (8.6%)	3.0 (4.3%)	60.0 (85.7%)	1.0 (1.4%)
	Ph.D. students	1.0 (2.9%)	0.0 (0.0%)	29.0 (85.3%)	4.0 (11.8%)
Biobanking	M.Sc. students	17.0 (24.6%)	18.0 (26.1%)	34.0 (49.3%)	0.0 (0.0%)
	Ph.D. students	1.0 (2.9%)	2.0 (5.9%)	27.0 (79.4%)	4.0 (11.8%)
Stem cells	M.Sc. students	5.0 (7.1%)	8.0 (11.4%)	56.0 (80%)	1.0 (1.4%)
	Ph.D. students	0.0 (0.0%)	1.0 (2.9%)	29.0 (85.3%)	4.0 (11.8%)
Cloning	M.Sc. students	7.0 (10.0%)	17.0 (24.3%)	44.0 (62.9%)	2.0 (2.9%)
	Ph.D. students	0.0 (0.0%)	3.0 (8.8%)	26.0 (76.5%)	5.0 (14.7%)
Gene therapy	M.Sc. students	6.0 (8.7%)	19.0 (27.5%)	41.0 (59.4%)	3.0 (4.3%)
	Ph.D. students	0.0 (0.0%)	2.0 (5.9%)	27.0 (79.4%)	5.0 (14.7%)
Genetic engineered products	M.Sc. students	6.0 (8.7%)	19.0 (27.5%)	43.0 (62.3%)	1.0 (1.4%)
	Ph.D. students	1.0 (2.9%)	2.0 (5.9%)	27.0 (79.4%)	4.0 (11.8%)

Postgraduate students' attitudes on Bioethical Issues

The study revealed that more than 80 percent of the students were of the opinion that bioethics and public health were related issues and knowledge and awareness of the community on bioethics should be increased. Also most of the PhD (91.2%) and MSc (79.7%) students felt that their information in bioethics should be renewed from time to time (Table 3).

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOR: 20.1001.1.22519521.1395.9.22.11.0]

Table 3: Postgraduate students' attitudes on Bioethical Issues

	M.Sc. students Number (%)	Ph.D. students Number (%)	P value
1. Is there any relationship between bioethics and public health issues?			
Yes	56.0 (80%)	27 (79.4%)	0.944
No	0.0 (0.0%)	0.0 (0.0%)	
To some extent	14.0 (20%)	6.0 (20.6%)	
2. Do you think postgraduate medicine and biology students should be up to date on bioethics?			
Yes	55.0 (79.7%)	31.0 (91.2%)	0.140
No	14.0 (20.3%)	3.0 (8.8%)	
To some extent	0.0 (0.0%)	0.0 (0.0%)	
3. Should the community be aware of and informed about bioethics?			
Yes	52 (74.3%)	30.0 (88.2%)	0.258
No	7.0 (10.0%)	1.0 (2.9%)	
To some extent	11.0 (15.7%)	3.0 (8.8%)	

Educational courses and activities arranged for postgraduate students

More than 50% of PhD students reported that they had opportunities to learn about bioethics during studying distinct courses while only 4.3% of MSc respondents could have equal opportunity. Also the lack of other educational activities with the aim of raising bioethical awareness and qualification of the postgraduate students through specialist congress, seminars and workshops for both PhD and MSc students is observed in university (Table 4).

Table 4: Academic activities towards bioethics for postgraduate students

	M.Sc. students Number (%)	Ph.D. students Number (%)	P value
1. Is bioethics presented as a distinct course in your class?			
Yes	3.0 (4.3%)	19 (55.9%)	<0.001
No	67.0 (95.7%)	15.0 (44.1%)	
2. Has any activity been done in your department with the aim of raising bioethical awareness?			
Yes	6.0 (8.8%)	11.0 (32.4%)	0.003
No	62.0 (91.2%)	23.0 (67.6%)	

Postgraduate student's attitudes on responsible individuals for bioethics education

Most respondents mentioned that a scientific committee including physicians, lawyers and religious advisors and some experts in related areas of bioethics like biotechnology and biology should have the responsibility for bioethics education of postgraduate students in university (Table 5).

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOR: 20.1001.1.22519521.1395.9.22.11.0]

Table 5: Postgraduate student's attitude about academic resources responsible for bioethics education in university

Responsibility	Educational status	F (%)
Ethics committee of university or faculty	M.Sc. students	7.0 (10.0%)
	Ph.D. students	8.0 (24.2%)
Educational vice-chancellor of university or faculty	M.Sc. students	10.0 (14.3%)
	Ph.D. students	4.0 (12.1%)
Bioethics associated committee including biotechnologists and biologists, physicians, lawyers and religious advisors	M.Sc. students	44.0 (62.9%)
	Ph.D. students	19.0 (57.6%)
Head of department	M.Sc. students	0.0 (0.0%)
	Ph.D. students	0.0 (0.0%)
Biology and biotechnology specialists	M.Sc. students	8.0 (11.4%)
	Ph.D. students	2.0 (6.1%)
Lawyers	M.Sc. students	1.0 (1.4%)
	Ph.D. students	0.0 (0.0%)

F= Frequency

Discussion

Bioethics is a multidisciplinary field which has been risen following biotechnology and other related treatment technology developments. Bioethics education has been recognised by the global biology community and is reflected in the related literature (9).

We assessed the knowledge and attitudes of the postgraduate students of basic medical sciences in Faculty of Medicine related to the bioethical issues.

In parallel to our research, some international surveys also do cover the issue of bioethics education in different countries and represent a diversity of decisions in all societies.

We found out that while the rudimentary knowledge of all respondents in different aspects of bioethics such as organ transplant, biobanking, stem cell research, cloning, gene therapy and genetically engineered products was unfavorable, few PhD students had a good insight on the issues. Respondents from molecular medicine and medical biotechnology departments, where bioethics had been included in their curriculum, exhibited relatively high level of awareness on bioethical issues in comparison to students of other faculties. The same results have been reported in Ilyas et al. survey about the awareness level regarding bioethical issues among graduate and postgraduate students in Mansehra University, Pakistan. All of the respondents (100%), who were studying in Genetics Department, were aware of the term bioethics because the subject was part of their curriculum (10).

Approximately half of the PhD students have studied a distinct course in bioethics while only 4.3% of MSc respondents have had such an opportunity. A relatively higher percentage of PhD students (32.4%) mentioned that some lectures/seminars and workshops on bioethics had taken place in their department but this proportion for M.Sc. respondents was very low (8.8%). This fact clearly shows the vital role of educational activities held in university towards students' bioethical awareness.

In response to the question "Do you think

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOR: 20.1001.1.22519521.1395.9.22.11.0]

postgraduate medicine and biology students should be up to date on bioethics?" nearly 80% of MSc students and more than 90% of PhD students were highly receptive. Although it showed that they realized their responsibility towards their field of study, their attitudes indicated and reaffirmed the fact that university policy makers should be more sensitive to student's great desire to the subject. At the same time the findings showed that adequate bioethics education for postgraduate students had not been provided.

Results from this survey reveal that the majority of respondents hold the opinion that being well-informed about the different aspects of bioethics is a necessity which sheds more light on their strong motivation to take part in future bioethical courses held by the Faculty of Medicine. As other studies have mentioned earlier (22), participants in this survey going to be a member of healthcare professionals who are experts in modern treatment strategies so they must undergo bioethics education seriously and systematically. It should be mentioned that also overwhelming support for the inclusion of bioethics in school and university curricula has been reported in other countries (10-21). Two main reasons have been stated for the necessity of bioethics education including increasing respect for life (which is more common in Japan and India) and increasing the student's ability to cope with sudden critical conditions due to application of new science and technology (which is more common in Australia, New Zealand and Singapore) (10-21).

On the other hand, it should be mentioned that more than 79% of postgraduate students recognized that bioethics and public health issues were linked together and most of the students believed that the community should be aware and informed about bioethics (Table 3). The results of our study also showed that students felt responsible for social and environmental dilemmas related to biological materials as well. Additionally, they believed that policy makers and government should have regulatory approaches with the aim of generating a safe practice and using these materials. Although the quality and responsibility of teaching of bioethics is under debate (21), most of our postgraduate students believed that the associated committee consists of biotechnologists and biologists, physicians, lawyers and religious advisors should be responsible for teaching and discussing bioethical issues in university. Students' responses indicated that they have recognized the importance of bioethics as a multidisciplinary field. Since most of the postgraduate students rely on their university curricula as the best resource for receiving their knowledge of bioethics, the role of university to accomplish this educational mission assumes greater significance in this research. Moreover, regarding the increasing number of postgraduate students in different departments of Faculty of Medicine in Mashhad University of Medical Sciences and their subsequent bioethical challenges in respect to low level of general information in the field, arranging bioethical issues in postgraduate curricula, as we mentioned earlier, seems highly prioritized.

Conclusion

From the results of the present study it can be concluded that awareness level regarding bioethical issues was not very desirable among postgraduate students of Mashhad University of Medical Sciences. The significant difference between the PhD and MSc students in terms of their knowledge of bioethics was due to incorporating the subject into the faculty's curriculum in some especial fields like medical biotechnology and molecular medicine and also lectures and seminars as an educational multiple sources for other students. Regarding the lack of an

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOR: 20.1001.1.22519521.1395.9.22.11.0]

educational program in bioethics for the majority of MSc students of genetics, biotechnology and other related fields, as well as PhD students in some other fields it seems that time has come for taking a serious look into the issue.

The findings of the study highlighted that most of the postgraduate students felt responsible towards their community and deeply recognized the importance of increasing their knowledge of bioethics and keeping up to date with bioethical issues as a specialist in the field. So we propose the necessity of incorporation of bioethics in the postgraduate students' curricula in all medical related fields in Mashhad Medical Faculty. This integration would be beneficial for the public health and research community. The results of this study will be a useful guide to curricula designers and educators of postgraduate students in Mashhad Medical Faculty.

Acknowledgment: The present research study has been supported by the Research Council of Mashhad University of Medical Sciences. The authors would like to thank postgraduate students who volunteered to participate in this study.

References

1. Macer D.Moral games for teaching **bioethics**; 2008 – Unesdoc – Unesco

2. Zahedi F, EmamiRazavi SH, Larijani B. A two-decade Review of Medical Ethics in Iran. Iranian J Publ Health, 2009, 38(1):40-46.

3. Larijani B, Zahedi F, Malek-Afzali H. Medical ethics in the Islamic Republic of Iran. East Mediterr Health J, 2005, 11(5-6):1061-72.

4. Aramesh K. Iran's Experience on Religious Bioethics: an Overview. Asian Bioethics Review, 2009, 318-328.

5. Zahedi F, Larijani B. National bioethical legislation and guidelines for biomedical research in the Islamic Republic of Iran. Bulletin of the World Health Organization, 2008, 86: 630–634.

6. Afshar L, Bagheri A. embryo donation in Iran: an ethical review. Developing World Bioethics, 2012, doi: 10.1111/j.1471-8847.2012.00334.x.

7. Zali MR, Shahraz S. Current situation of bioethics in genetic research in Iran. The experiences of challenges of science and ethics: Proceeding of an American-Iranian workshop, 2003, Appendix H.

8. Zali MR, Shahraz S, Borzabadi Sh. Bioethics in Iran: legislation as the main problem. Arch Iran Med, 2002, 5(3): 136-40.

9. Macer D. Why Bioethics is needed and What Bioethics is needed: Results of IUBS Member Survey 2005. (http://www.archive.concord.org/intl/cbe/papers/macer.html'dan)

10. Ilyas M, Alam M, Ahmad H, Tariq M, Bibi S, Ali A, et al. Awareness regarding bioethical issues among the students & faculty of Hazara University Mansehra, Pakistan. Pak J Med Sci, 2009, 25(1):97-102.

11. Itai K, Asai A, Tsuchiya Y, Onishi M, Kosugi S. How do bioethics teachers in Japan cope with ethical disagreement among healthcare university students in the classroom? A survey on educators in charge. J Med Ethics, 2006, 32:303–308.

12. Asai A, Nagata S, Fukui T. What ought to be done regarding healthcare ethics education in Japan? Eubios J Asian IntBioeth, 2000, 10:2–5.

13. Khizar B, Iqbal M. Perception of Physicians and Medical Students on common

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOR: 20.1001.1.22519521.1395.9.22.11.0]

Ethical Dilemmas in a Pakistani Medical Institute. Eubios Journal of Asian and International Bioethics EJAIB, 2009, 19 (2).

14. Yang WP, Chen CH, Chao CS, Lai WS. Bioethics education for practicing nurses in Taiwan: Confucian-Western clash. Nurs Ethics, 2010, 17(4):511-21.

15. Inaba M, Macer D. Attitudes to biotechnology in Japan in 2003. Eubios Journal of Asian and International Bioethics, 2003, 13:78-90.

16. Kachonpadungkitti Ch, and Macer D. Attitudes to Bioethics and Biotechnology in Thailand (1993-2000), and Impacts on Employment.Eubios Journal of Asian and International Bioethics, 2004, 14:118-134.

17. Mattick K, Bligh J. Teaching and assessing medical ethics: where are we now? J Med Ethics, 2006, 32:181–185.

18. Johnston C, Haughton P. Medical students' perceptions of their ethics teaching. J Med Ethics, 2007, 33:418–422.

19. Al-Haqwi AI, Al-Shehri AM. Medical students' evaluation of their exposure to the teaching of ethics. J Fam Community Med, 2010, 17:41-5.

20. Ogundiran TO, Adebamowo CA. Medical Ethics Education: A Survey of Opinion of Medical Students in a Nigerian University. Journal of Academic Ethics, 2010, 8(2): 85-93.

21. Iltis AS. Look Who's Talking: The Interdisciplinarity of Bioethics and the Implications for Bioethics Education. Journal of Medicine and Philosophy: A Forum for Bioethics and Philosophy of Medicine, 2006, 31(6): 629-641.

22. Yang WP, Chen CH, Chao CS C, Lai WS, Bioethics education for practicing nurses in Taiwan: Confucian–western clash, Nursing Ethics, 2010, 17(4) 511–521.

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOR: 20.1001.1.22519521.1395.9.22.11.0]