

Bioethics: Awareness, attitudes and opinions among University students and Faculty/Researchers

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ABSTRACT

Objective: To assess awareness, attitudes and opinions regarding bioethical issues among graduate students and faculty/researchers of universities in Lahore, Pakistan.

Methodology: A questionnaire consisting of 20 questions was designed and sent to 700 students and faculty members/researchers of 14 academic departments/research institutions of seven universities in Lahore, Pakistan. Data were analyzed with descriptive statistics using SPSS 16.0.

Results: We obtained responses from 87% (614/700) participants. The sample populations appeared receptive to latest developments in science and technology; and were optimistic that such developments will have positive effect on their lives. On average almost 90% of the respondents were familiar with the term "bioethics"; 75.4% of the respondents desired that bioethics should be taught regularly in the classes. However, students of two important disciplines of knowledge i.e law and Islamic studies had awareness levels of only 43% and '0%' respectively regarding the term bioethics. A vast majority of the respondents were not satisfied with the state laws, policies, rules, regulations and institutions concerned with bioethical issues. The survey indicated that cloning (27.2%), abortion (24.6%) and organ donation (13.2%) are regarded as the most important bioethical issues, probably for specific reasons of the glamour attached to the technology, moral connotations and the hype created by media respectively.

Conclusion: Educated youth in general have positive attitude towards S&T and its effect on their lives. Awareness level among students and faculty of life sciences is very high; however it is dismally low among students of Law and Islamic studies. The results of this survey does not necessarily mirror the awareness level, attitudes and opinions in the society at large since literacy level among the masses is low (57%) and prevalence of higher levels of education is even lower.

KEY WORDS: Bioethics- Society-Research- Organ donation- Abortion- GMO's- Religion.

Pak J Med Sci July - September 2012 Vol. 28 No. 4 680-685

How to cite this article:

Alam M, Rahman Z, Shah M, Zar MS, Shams S, Ali F, et al. Bioethics: Awareness, attitudes and opinions among University students and Faculty/Researchers. Pak J Med Sci 2012;28(4):680-685

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- * Received for Publication: November 24, 2011
- * 1st Revision Received: May 24, 2012
- * 2nd Revision Received: June 2, 2012
- * Final Revision Accepted: June 5, 2012

INTRODUCTION

Pakistan, located in South Asia, is home to 173.4 million people. The literacy rate in the country is only 57%, which is one of the lowest in the world. Almost 23% of the population lives below the poverty line. Although the national per capita income is around US\$1051 per annum, however a high degree of disparity exists in income distribution and access to basic social services.¹

As a result of poor investment in human development, the country has lagged behind in Science and Technology, even in comparison to its next door neighbors such as India and China. Pakistan is just beginning to enter the realm of technology, though admittedly there is a lot of catching up to do. Since its establishment in 2001, the Higher Education Commission (HEC) of Pakistan has invested significant amounts of money in higher education and R&D. As a result the number of Universities, both private and public, has increased from 59 in 2000-2001 to more than 132 in 2010-2010. The Research output in the form of research publications has increased by 600% in the same period.²

The western societies, working within their own value system, may have been able to develop a 'near consensus' on how to deal with at least some of the thorny bio-ethical questions. The Pakistani society, on the other hand, is yet to deliberate upon such questions in accordance with its own, unique socio-cultural and religious heritage. The importance of 'cultural relevance' of ethical principles in general and applied ethics in particular, can hardly be over emphasized. Looking at the background information, one can expect common folk, and sometimes even scientists/researchers to be unaware of and uninterested in, ethical questions. This kind of ignorance, fear to explore uncharted territories or simple disinterest can have negative consequences for social, economic and physical environment. There is little debate, if any, in the Pakistani print and electronic media on bioethical issues, except for occasional splashing of sensational news such as black market organ trade. For a vast majority, bioethics means clinical and medical ethics. Ethical issues pertaining to genetically modified organisms (GMO), gene therapy, cloning etc, are left out of the debate or even the news.

The lack of interest by medical community, who should have pioneered such debate, is evident from the fact that only one technical journal i.e. "The Pakistan Journal of Medical Ethics" is being published. Recently, there have been attempts to sensitize the general public and professionals to bioethical issues. For example the Sindh Institute of Urology and Transplantation (SIUT) Karachi has established the Centre of Biomedical Ethics and Culture (CBEC). The centre has been conducting one year postgraduate diploma courses on bioethics since 2006. Although Bio-medical ethics for students of medicine was introduced by Aga Khan University Karachi, as early as 1984, however specialized degree programmes were started as late as 2008 when the Agha Khan University (AKU) started a Masters degree programme in bioethics. Since 2009, CBEC has also started a two year postgraduate degree programme.

In the above mentioned context, a survey was conducted among the university students/faculty in Lahore to assess their awareness, attitudes and opinions about bioethical issues.

METHODOLOGY

The survey was conducted through a questionnaire which consisted of 20 questions (Table-I). The questionnaire was distributed among 700 research scholars of 14 academic departments (CEMB, IBB, MMG, Basic Sciences, Medicine, DVM, Microbiology, Biotechnology, IIB, Botany, Pharmacy and Immunology, Law and Islamic studies) of seven universities in Lahore (Table-II). Mostly Students/faculty of life sciences were approached although students/faculty of Islamic studies and Law departments were also included in the study for comparison. The questionnaire was administered by the authors and some trained

Table-I: Participant's views on Bioethical Issues.

S. No.	Question	Yes Number (%)	No Number (%)	Don't Know Number (%)
1.	Do you think S&T do more harm than good, more good than harm, or about the same of each?	More good 469(76.4)	About the same 120 (19.5)	More harm 23 (3.7)
2.	Are you familiar with the term Bioethics?	546 (88.9)	68 (11.1)	00 (00)
3.	Have you ever discussed Bioethics in the class?	463 (75.4)	151 (24.6)	00 (00)
4.	Do you know what kinds of GM foods have been introduced in Pakistan?	355 (57.8)	65 (10.6)	194 (31.6)
5.	Should the government allow organ donation in Pakistan?	429 (69.9)	78 (12.7)	107 (17.4)
6.	If your father needs a kidney would you be willing to "buy" one from the black market?	194 (31.6)	241 (39.3)	179 (29.2)
7.	Should Pakistan freely allow Abortion?	479 (78)	135 (22)	00 (00)
8.	Are you aware of the implications of Stem Cell Technology?	385 (62.7)	63 (10.3)	166 (27)

students. Six hundred and fourteen (614) responses were received back. Computer software SPSS 16.0 and Microsoft Excel were used to analyze the data. The current paper reports the results of only one set of questions (Table-I).

RESULTS

Out of 700 research students and faculty members, 614 (87.7%) individuals responded. Table-I provides a summary of the free-form text responses to Survey. A vast majority of the respondents (76.4%) reported that Science and technology has done more good to the society than it has done harm. The proportion of respondents who were familiar with the term Bioethics and those who were unaware of the term was 88.9:11.1. This kind of response was corroborated by the fact that 75.4% respondents had discussed bioethics in the class. In our previous study, conducted among the faculty and graduate students of Hazara University Mansehra, Pakistan, we had found that 90.4% of those who responded were familiar with the term bioethics³ hence; results of the two studies are identical in this regard.

An overwhelming majority (70.8%) of the respondents regarded religion as the most important influence on the way they lived. With this kind of thinking, it was not unexpected that 63.8% of respondents thought that that religion provides ideal framework for bioethical discussions. The prevailing dis-satisfaction over government's lukewarm response to bioethical issues was reflected by the fact that only 18.4% of those surveyed were satisfied with the existing legal/constitutional provisions. Similarly, 24.7% of the

Table-II: Rate of awareness about bioethics in various institutions and academic programmes.

S/No.	Institution/academic programme	Awareness rate (% of respondents)
1.	CEMB	95.5
2.	IBB	100
3.	MMG	100
4.	Basic Sciences	100
5.	Medicine	98
6.	DVM	100
7.	Microbiology	90
8.	Biotechnology	90
9.	IIB	100
10.	Botany	100
11.	Pharmacy	83
12.	Immunology for	86.4
13.	Law	42
14.	Islamic Studies.	0

respondents were of the view that the government has not framed appropriate policies for addressing bioethical issues.

Those disapproving the development/sale/trade of GMO's under any circumstances were only 11.5% of the total respondents, as compared to 22.5% respondents who preferred a blanket approval. A majority (58.4%) of respondents would grant a conditional approval to products of biotechnology or genetic engineering.

When asked to identify the most important bioethical issue, 27.2% of the participants considered cloning as the most important bioethical issue. When faced with the grim prospect of having a close relative suffering from renal failure, 31.6% of the participants stated that they would be willing to 'buy' kidneys from the black market to save the life of their loved ones, while 39.3% opposed such an idea. An overwhelming majority of the respondents were opposed to the idea of allowing abortion freely.

DISCUSSION

Recent advances in treatments, therapies and technologies are for the betterment of all populations.⁴ In the current study most of the respondents (76.4%) not only expressed interest in developments in science and technology but also believed that S&T would benefit their lives. This can

Table-III: Profile of respondents (n=614).

S. No	Parameter	Number (Percent)
1.	Age (in years)	
	<20	18(2.9)
	21-25	374(60.9)
	26-30	188(30.6)
	31-35	17(2.8)
	36-40	14(2.3)
	>40	3(0.5)
2.	Sex	
	Male	280(45.6)
	Female	334(54.4)
3.	University	
	PU	291(47.4)
	GCU	47(7.7)
	UHS	43(7)
	UVAS	84(13.7)
	SKMCHRC	37(6)
	UOL	64(10.4)
	K.E	48(7.8)

PU: University of the Punjab, GCU: Govt. College University, UHS: University of Health Sciences, UVAS: University of Veterinary and Animal Sciences, SKMCHRC: Shaikat Khanum Memorial Hospital and Research Center, UOL: University of Lahore, KE: King Edward Medical University.

be regarded as a healthy trend towards objective and rational thinking in a conservative society. A meager 3.1% of the respondents had absolutely no interest in S&T.

The survey showed that only 22.8% of the respondents would unconditionally approve products of biotechnology and genetic engineering while 11.6% would disapprove 'under all circumstances'. A majority (58.5%) of the respondents were not willing to out-rightly approve or disapprove such products; they would rather grant their approval to such products provided there was no risk to environment or health.

The average awareness rate for all respondents from various institutions/academic backgrounds was 88.9% (Table-I). However, the awareness rate showed wide variation (0% to 100% awareness) depending upon institutions and academic programmes being pursued by respondents (Table-II). Those aware of the term also agreed with the suggestion that bioethics should be regular part of the curriculum in academic programmes.

It was surprising to note that the lowest awareness rate was among students of Law and Islamic studies i.e. 43% and '0%' respectively. It appears particularly strange because Muslim Jurists and Scholars such as Imam Ghazali, Ibne Taymmiya, Imam Abu Hnifa and others have discussed bioethical questions such as abortion, contraception, etc hundreds of years ago. There are references to bioethical issues in the Quran and Hadith. In modern times there have been Fatwas on blood transfusion, modern techniques of contraception, organ donation/transplantation, euthanasia etc. by individual scholars as well as institutions.^{5,6} Although the curricula, syllabi and academic programmes of all subjects need to be reviewed to harmonize them with the present day requirements, however the situation with regards to Law and Islamic studies requires special and immediate attention since this is a society which is deeply conservative and where, as affirmed by this survey, a majority of the respondents preferred to seek guidance from the teachings of religion (Islam) to settle bioethical dilemmas.

Awareness campaigns launched by organizations such as Pakistan Medical and Dental Research Council (PMDC)⁷, SIUT, WHO, FAO, Universities and other organizations may prove useful in this regard.

The sensational reporting of news pertaining to transplantation, donation, sale and theft of organs in Pakistani mass media has probably affected the outlook of the masses regarding the

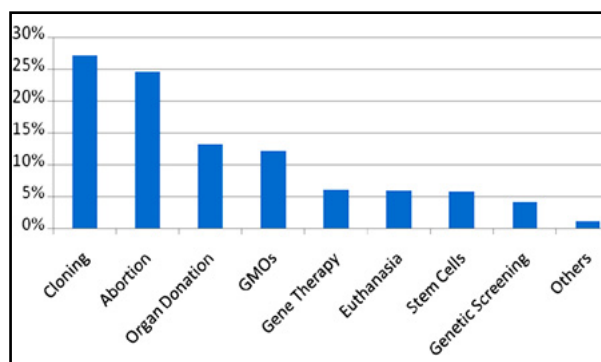


Fig.1: Ranking of most important bioethical issues.

relative significance of bio-ethical issues. Cloning, abortion and organ donation/transplantations were identified by the respondents as the most important bio-ethical issues. Cloning research, especially of eukaryotes, is not in a highly developed state in Pakistan. The fact that cloning was identified as the most important bioethical issue may be the fascination or glamour associated with this technology as popularized by Hollywood movies and Sci Fi novels. Similarly, abortion may have been identified as the second most important bioethical issue because of the social unacceptability of premarital pregnancy rather than as a strictly bioethical issue. The role of media is almost certainly the cause of 'organ donation/transplantation' as being identified as the third most important bioethical issue (Fig.1).

A liberal and pragmatic attitude was recorded in the study with respect to the concept of organ donation. A significant number of respondents approved organ donation (Table-I), to the extent that 31.6% of the respondents were even ready to purchase organs (kidneys) from the black market to save the life of a loved one in case there was no other option. This opinion clearly demonstrates the fact that in the absence of a well developed and well regulated organ donation practice, the black market trade and even theft of organs, will thrive. It must also be noted that 39.3% of the respondents would reject the idea of purchasing kidney from the black market (Table-I). The other side of the picture i.e. the sale of organs was depicted in another study¹¹ which showed that 60% of the students of a local medical college in Karachi considered it un-ethical for a person to sell his organs (kidneys). However, it is worth noting that the same study showed that 37% of the students thought there was no harm in such a practice. Similarly, Qidwai et al⁸ had concluded that a significant number of respondents considered the sale/purchase of kidney acceptable.

The relatively higher acceptability of kidney trade recorded by Qidwai *et al*⁸ can be attributed to the fact that their study was conducted in a hospital environment among kidney patients.

Seventy one percent (71%) of those surveyed were dissatisfied with the government's policies on bioethical issues. A similar conclusion was also drawn by Hyder and Nadeem⁹, stating that the unavailability of effective policy and legislation related to bioethics has a bad effect on "biology" as a profession. Such views are not surprising due to the fact that the government has not come up with clear policies in response to the bioethical issues raised by the emerging technologies and hardly any policies or regulations exist on GMO's, organ donation, cloning, gene therapy and stem cell research etc. The fact that the legislature has not kept pace with emergence of bioethical questions due to actual or potential use of new technologies, is evident from the fact that only 1.4% of the respondents thought that state laws could provide the basic blue print for developing specific answers to questions of bioethics. Initiatives such as Pakistan Environmental Protection Act (1997), PMDC's Code of Ethics (2001), Constitution of National Bioethics Committee (notified 2004)¹⁰ Biosafety Rules to Control Harmful GMO's (2005a), National Biosafety Guide Lines (2005b), Transplantation of Human Organs and Tissues Act (2010) etc. needs to be appreciated.

By saying that "religion played a very important role in their lives", a majority of the respondents (63.8%) implied that they looked towards religion to find answers to questions and dilemmas of bioethics. In other words, they would prefer to settle ethical questions in accordance with teachings of Islam. The role of religion in the Islamic Republic of Pakistan has been emphasized in the literature by several authors.¹¹⁻¹³ However in this context the level of awareness about bioethical issues among the students of Law and Islamic studies becomes very important. It obvious that religious scholars and jurists needs to be consulted while framing laws and regulations, however, one should also look at the orientation they get with respect to bioethics during their education.

A vast majority of the respondents were found to be 'pro-life' and 'anti-abortion' in their outlook. However, the flexibility to allow abortion for special reasons such as danger to the life of mother or abnormality of the fetus was notable. Such flexibility was also recorded by Gilani et al who reported that majority of parents of children having

congenital disorders, were in favor of abortion in case of an affected fetus.¹⁴

CONCLUSIONS

The study shows that educated youth in general have positive attitude towards S&T and expect progress in S&T to have a positive impact on their lives. Awareness level pertaining to bioethics among students and faculty of life sciences is very high; however it is dismally low among students of Law and Islamic studies. The need to disseminate a basic level of knowledge among all segments of society is evident from this study. The relative importance given to various bioethical issues was grossly affected by the type of reporting in mass media; which also points to the potential positive use of media in creating awareness and providing a forum for debate. The sample population was not satisfied with the existing laws, rules, regulations and institutions related to bioethics; and would look towards religion for answers to bioethical questions. The attempts for providing framework of laws, rules regulations, codes of conduct etc regarding bioethical issues and the initiative for imparting focused education (diploma/degree programmes) needs appreciation and further expansion and consolidation.

RECOMMENDATIONS

For the youth, a comprehensive change in syllabi, curricula, courses and academic programmes of all levels of education and all disciplines of knowledge is suggested. Such documents/programmes should emphasize the significance and relevance of bioethical questions. Answers and solutions must be presented in an objective manner.

Awareness regarding bioethical issues needs to be broader based instead of being focused among students of life sciences. This will enable all the stakeholders to identify relevant bioethical issues and address them after a reasonable level of knowledge without over or under emphasizing the issues at hand.

Mass media must be encouraged not only to educate the masses but also to provide a platform for debate. The media managers themselves would require some degree of guidance from scholars in bioethics.

To create awareness among the masses and to stimulate the professionals would require a deliberate and sustained effort. At organizational level, bioethics committees need to be established in R&D and health related institutions to help

formulate ethical guidelines and advise the institution concerned on ethical questions.

On national level a pool of experts including Ulema, Lawyers, biologists, doctors, traders, environmentalists, industrialists, civil society representatives, needs to be developed. Such experts should frequently meet for exchange of ideas, for assisting the legislators and government in formulating legislation/rules/regulations on bioethical issues. The experts should, above all, ensure the guidance of masses in general.

ACKNOWLEDGEMENT

We would like to express our indebtedness to Mr. Muhammad Ilyas, Mr. Muhammad Israr, Ms. Syyada Samra Jafri and Ms. Saliha Shakeel of Center of Excellence in Molecular Biology Lahore, Mr. Syed Hassan Bukhari of Institute of Biochemistry and Biotechnology, University of the Punjab, Lahore for their help in conducting this survey.

ABBREVIATIONS

SPSS: Statistical Package for the Social Sciences; GMO: Genetically Modified Organisms; HEC: Higher Education Commission; SIUT: Sindh Institute of Urology and Transplantation; CBEC: Centre of Biomedical Ethics and Culture; WHO: World Health Organization; FAO: Food and Agriculture Organization; PMDC: Pakistan Medical and Dental Research Council

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Authors Contributions:

ZR and MA conceived the study, participated in its design, coordination and critically reviewed the manuscript. SS, FA, MKK, MSZ and MS helped in survey. MS analyzed the data statistically. MA helped ZR in critical review of manuscript and participated in statistical data analysis. All the authors read and approved the final manuscript.

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