

# Awareness Levels of Biomedical Ethics in Undergraduates

Mi-soon Jeon and Hyun-jeong Kim\*

Department of Nursing, Baekseok University, Cheonan, 330-704, South Korea; jms@bu.ac.kr, kimhj@bu.ac.kr

## Abstract

This study describes the college students' level of awareness regarding biomedical ethics. Data were collected using Biomedical Ethics Scale. The instruments were distributed to college students in universities located in Chungnam; 200 responses were returned. Data were analyzed using SPSS 18.0. The result showed that the average awareness level was 2.42 out of 4. Among the sub-categories, the awareness level on organ transplant indicated the highest score at 2.71 and there was a statistically significant difference according to gender ( $t=-6.465, p<.001$ ), grade ( $F=5.664, p=.001$ ), major ( $F=29.290, p<.001$ ), religion ( $F=2.836, p=.039$ ), education experience ( $t=7.747, p<.001$ ). Therefore, it is necessary to improve multi-faceted education program on biomedical ethics based on one's major as well as education, and hands-on experience of biomedical ethical issues.

**Keywords:** Biomedical Ethics, Biomedical Ethics Education, Ethical Awareness

## 1. Introduction

### 1.1 Background

Advances in bio science and medical technologies have extended and enriched human lives by curing a range of diseases. These changes have triggered a new set of ethical issues such as abortion, euthanasia, organ transplant, standards of death, stem cell research and gene diagnosis, which cannot be solely addressed by traditional ethics. Against this background, the idea of biomedical ethics has emerged as a new form of ethics for humans to embrace in the bio science era that started in the 1960s<sup>1,2</sup>. Bioethics should be handled as 'values' or an 'outlook' that constitute an essential part of different life conflicts and choices, including death issues, rather than being merely confined to physical or medical situations. In particular, it is critical for undergraduate students, the future leaders of society, to receive a proper biomedical ethics education. These students belong to youth hood, a period marked by the formation of conscience and the establishment of identity and values. They may be grown-ups in body and mind, but in reality their values are yet to be established,

making them susceptible to both manipulation and education. Therefore, teaching them biomedical ethics at this age will be much more effective than during any other period of their lives<sup>3</sup>. Besides, youth hood is closely linked with a number of biomedical ethics issues, such as suicide, artificial termination of pregnancy, and organ donation<sup>4</sup>. However, today's Korean ethics education does not cover current social issues in depth, while people are inundated with insufficient, inaccurate information and data from TV and Internet media outlets. This may be damaging to ethical thinking and to the promotion of proper bioethics<sup>5</sup>. It is tremendously important to prepare undergraduate students to form a proper perception and sense of responsibilities in relation to biomedical ethics, as those students will eventually lead the next generation<sup>6,7</sup>.

In light of the above, this study was aimed at assessing the awareness levels of undergraduate students with respect to biomedical ethics, and laying the groundwork for the directions and contents of an ethics education which is needed to raise the proper awareness of biomedical ethics in undergraduate students.

\*Author for correspondence

## 1.2 Research Objectives

The objectives of this study were;

- 1) To identify the subjects' general characteristics
- 2) To identify the subjects' level of awareness regarding biomedical ethics
- 3) To identify the difference in the subjects' awareness of biomedical ethics according to general characteristics

## 2. Methodology

### 2.1 Study Subjects and Ethical Consideration

This study is a descriptive research to examine the awareness levels of undergraduate students regarding biomedical ethics. A survey was conducted from November to December 2012 among 210 students attending universities in Seoul, the South Chungcheong Province and the Gyeonggi Province, who had agreed to participate in the research after being notified in writing of the research objectives, spontaneity of participation, and confidentiality. Among the 210 questionnaires completed, 200 were used as research data while the other ten were excluded due to unclear or missing answers.

### 2.2 Research Variables

As a tool to measure the awareness of biomedical ethics, a bioethics questionnaire elaborated by Reference<sup>8</sup> and later modified by Reference<sup>9</sup> was used. Each question was given a score out of 4, with 4 indicating 'agree', 3 'generally agree', 2 'generally disagree' and 1 'disagree'. Negatively-worded items were reverse-scored and higher scores represented a higher level of awareness of biomedical ethics issues concerning human life. The reliability of the research tool was 0.76 as measured by Cronbach's alpha.

### 2.3 Method of Data Analysis

The collected data were analyzed using the SPSS 18.0 Program.

- 1) The general characteristics were measured in frequency and percentage.
- 2) The awareness levels of biomedical ethics were analyzed in terms of average and standard deviation.
- 3) A t-test and ANOVA were performed to examine the difference in awareness of biomedical ethics by group,

with respect to general characteristics. Scheffé's test was applied as a follow-up.

## 3. Findings

### 3.1 General Characteristics of the Subjects

Table 1 presents the general characteristics of the subjects, with 29.0% male and 71.0% female participants. Third-year students accounted for the largest number of participants, at 58%. Public health majors constituted 50.5% of the respondents, while humanities, natural science, and arts and physical education majors contributed 16.5%, 16.5% and 10.0%, respectively. Protestants were 54.0%, representing the largest share. 61.0% said they had received prior education on biomedical ethics and 51.0% answered that they had had hands-on experience on the subject. As for ethical values, 'vary by circumstance' was the highest at 49.0%, followed by 'sometimes confused' at 37.5% and 'very strong' at 12.5%.

### 3.2 Awareness Levels of Biomedical Ethics

The average awareness level of the subjects regarding biomedical ethics was 2.42 out of 4. Among the subcategories, the awareness level on organ transplant indicated the highest score at 2.71. It was followed by 'life of fetus' at 2.56, 'artificial termination of pregnancy' at 2.39 and 'euthanasia' at 2.35 (Table 2).

### 3.3 Differences in Awareness of Biomedical Ethics by General Characteristics

An analysis of the difference in awareness of biomedical ethics according to general characteristics showed a statistically significant difference according to gender ( $t=-6.465$ ,  $p<.001$ ), school year ( $F=5.664$ ,  $p=.001$ ), major ( $F=29.290$ ,  $p<.001$ ), religion ( $F=2.836$ ,  $p=.039$ ), education experience ( $t=7.747$ ,  $p<.001$ ) and hands-on education experience ( $t=9.908$ ,  $p<.001$ ) (Table 3). Female subjects displayed higher awareness levels on biomedical ethics than their male counterparts, and second-year students showed higher levels than first- and fourth-year students. Public health majors demonstrated higher levels than other majors, while Catholics indicated higher levels than Protestants. Lastly, those who had received an education on biomedical ethics and had had hands-on experience presented higher awareness levels than those who had not.

**Table 1.** General characteristics of the subjects (N=200)

| Characteristics                          | Categories                         | n   | %    |
|------------------------------------------|------------------------------------|-----|------|
| Gender                                   | Male                               | 58  | 29.0 |
|                                          | Female                             | 142 | 71.0 |
| Religion                                 | Protestant Christians              | 108 | 54.0 |
|                                          | Catholics                          | 15  | 7.5  |
|                                          | Buddhists                          | 8   | 4.0  |
|                                          | No religion                        | 69  | 34.5 |
| Major                                    | Art and humanity                   | 33  | 16.5 |
|                                          | Natural sciences                   | 33  | 16.5 |
|                                          | Health care                        | 101 | 16.5 |
|                                          | Art, music, and physical education | 20  | 50.5 |
|                                          | Others                             | 13  | 6.5  |
| Education on biomedical ethics           | Yes                                | 122 | 16.5 |
|                                          | No                                 | 78  | 6.5  |
| Hands-on experience on biomedical ethics | Yes                                | 102 | 51.0 |
|                                          | No                                 | 98  | 49.0 |
| Ethical values                           | very strong                        | 25  | 12.5 |
|                                          | sometimes confused                 | 75  | 37.5 |
|                                          | vary by circumstance               | 98  | 49.0 |
|                                          | Others                             | 2   | 1.0  |

**Table 2.** Awareness of biomedical ethics in research subjects

| Variable                            | Average | Standard deviation |
|-------------------------------------|---------|--------------------|
| Biomedical ethics awareness         | 2.42    | .39                |
| Artificial termination of pregnancy | 2.39    | .48                |
| Organ transplant                    | 2.71    | .66                |
| Life of fetus                       | 2.56    | .71                |
| Euthanasia                          | 2.35    | .48                |
| Brain death                         | 2.18    | .42                |

## 4. Discussion

The average awareness level of the subjects regarding biomedical ethics was 2.42 out of 4, with nursing majors registering an average of 2.65, a lower result than the 2.97 average found by Reference<sup>9</sup> among undergraduate nursing students. Their level of awareness was nevertheless higher than that of non-public health majors, as is desirable in nursing majors who will be responsible for matters related to human life. Second-year students indicated the highest level of awareness, a result identical to the one found in the Reference<sup>5</sup>,

which compared the awareness of biomedical ethics between nursing majors and non-majors. As nursing ethics courses are usually offered to first and second years, the students may have experienced ethical dilemmas during their clinical training when confronted first-handedly with the pains of hospitalized patients, efforts to sustain a life, and medical team tasks. Therefore, a biomedical ethics education combining theory and practice and encompassing various topics should be continuously provided to nursing majors throughout the entire curriculum, with more in-depth practice for higher-level students<sup>10</sup>. In addition, when outlining the contents of the

**Table 3.** Awareness of biomedical ethics by general characteristics

| Characteristics                                  | Criteria                      | M ± SD   | t or F | p    |
|--------------------------------------------------|-------------------------------|----------|--------|------|
| Gender                                           | Male                          | 2.17±.35 | -6.465 | .000 |
|                                                  | Female                        | 2.53±.36 |        |      |
| School year                                      | 1 <sup>st</sup> year a        | 2.23±.35 | 5.664  | .001 |
|                                                  | 2 <sup>nd</sup> year b        | 2.56±.33 |        |      |
|                                                  | 3 <sup>rd</sup> year c        | 2.45±.41 |        |      |
|                                                  | 4 <sup>th</sup> year d        | 2.24±.30 |        |      |
| Major                                            | Humanities a                  | 2.27±.22 | 29.290 | .000 |
|                                                  | Natural science b             | 2.06±.37 |        |      |
|                                                  | Public health c               | 2.65±.30 |        |      |
|                                                  | Arts and physical education d | 2.31±.38 |        |      |
|                                                  | Others e                      | 2.16±.31 |        |      |
| Religion                                         | Protestant a                  | 2.39±.37 | 2.836  | .039 |
|                                                  | Catholic b                    | 2.69±.30 |        |      |
|                                                  | Buddhist c                    | 2.34±.32 |        |      |
|                                                  | No religion d                 | 2.42±.41 |        |      |
| Received education on biomedical ethics          | Yes                           | 2.57±.34 | 7.747  | .000 |
|                                                  | No                            | 2.19±.34 |        |      |
| Received hands-on education on biomedical ethics | Yes                           | 2.64±.30 | 9.908  | .000 |
|                                                  | No                            | 2.20±.34 |        |      |
| Ethical Values                                   | Very strong                   | 2.38±.40 | 0.733  | .533 |
|                                                  | Sometimes confused            | 2.48±.35 |        |      |
|                                                  | Vary by circumstance          | 2.39±.42 |        |      |
|                                                  | Unrealistic                   | 2.38±.14 |        |      |

biomedical ethics education, one should create a comprehensive scenario based on ethical situations, decision-making and ethical values that are often faced in clinical practice, in order to offer a practical education and training.

In the subcategories affecting the awareness of biomedical ethics in undergraduate students, the awareness levels for 'organ transplant' and 'newborn care' accounted for the highest score, 2.71. This is identical to research findings by Reference<sup>11</sup>. It is believed that newborn care showed the highest awareness levels because it considers the best interests of the patient based on the principle of beneficence. Awareness of organ transplant can be easily swayed by illegal organ trafficking or health inequality issues broadcast in the media, and this therefore calls for the provision of accurate ethics-based information<sup>12</sup>. The analysis of the difference in biomedical ethics awareness according to general characteristics also demonstrated higher awareness levels of biomedical ethics in Protestants or Catholics than in Buddhists or those with no religion.

This corresponds to Reference<sup>13</sup> research on the awareness of biomedical ethics in undergraduate students and is believed to be due to Protestant or Catholic practice which portrays man in the image of god and stresses deontological bioethics. The research findings evidenced a clear difference in the level of awareness of biomedical ethics by major. Moreover, those who had received an education on biomedical ethics indicated higher awareness levels regarding biomedical ethics issues. Therefore, in order to raise awareness of biomedical ethics in undergraduate students, a practical education should be offered through a variety of topics and methodologies.

## 5. Conclusion

Raising the awareness of biomedical ethics in undergraduate students calls for a multifaceted education on biomedical ethics based on one's major as well as education, and hands-on experience of biomedical ethical issues. This study has limitations in terms of generalization as it only examined undergraduate students in Seoul, Gyeonggi Province and South Chungcheong Province.

Therefore, it requires a replication study in the future to encompass the whole of the country. Moreover, as the awareness of biomedical ethics was assessed by self-evaluation, which may lack objectivity; it is recommended that reliable tools be developed to measure that awareness.

## 6. References

1. Kwon SJ. A study on the consciousness of biomedical ethics of the nursing students and medical students [Unpublished master's thesis]. Keimyung University; 2003.
2. Yoo MS, Shon KC. Effect of nursing ethics on biomedical ethics awareness, moral sensitivity and moral judgement of nursing students. *Journal of Korean Bioethics Association*. 2011; 12(2):61–76.
3. So BU, Park HS. A research on undergraduate students' bio-ethics concept. *The Catholic Thought*. 2004; 30:139–78.
4. Choo JW. A basic study on the educational contents for teenagers' bioethics. *Biomedical Law & Ethics*. 2008; 2(3):257–73.
5. Cho MK. A Comparison study on the consciousness of bio-medical ethics of nursing and non-nursing students. *Journal of Digital Convergence*. 2013; 11(4):311–20.
6. Jeon HS. Consciousness of bio-medical ethics in nursing students and non-nursing students. *Journal of Korean Academy of Fundamental Nursing*. 2011; 18(3):401–10.
7. Lee GS. A comparative study on the consciousness of biomedical ethics of health care professionals and non-health care professionals [Unpublished master's thesis]. Kyung Hee University; 2002.
8. Choi CS. Bioethical consciousness of primary school teachers in Gangneung city [Unpublished master's thesis]. Gangneung University; 2002.
9. Kwon SJ. A study on the Consciousness of Biomedical Ethics of the Nursing Students and Medical Students [Unpublished Master's thesis]. Keimyung University; 2003.
10. Kwon YH. Factors affecting the consciousness of biomedical ethics of the nursing students. *Journal of Korean Academy of Public Health Nursing*. 2009; 23(2):262–72.
11. Moon MY, Jang AH. Correlation between the nursing practice and consciousness of biomedical ethics of nursing students. *Journal of Korean Bioethics Association*. 2012; 13(2):49–62.
12. Jeong UJ. Knowledge and attitudes of Busan citizens towards brain death, organ donation and transplantation [Unpublished master's thesis]. Pusan Catholic University; 2010.
13. Sim HH. The perception of biomedical ethics in undergraduate students. *Korean Review of Crisis and Emergency Management*. 2013; 9(9):211–29.