International Journal of Advanced Nursing Education and Research
Vol.6, No.1 (2021), pp.53-60
http://dx.doi.org/10.21742/ijaner.2021.6.1.05

Effects of Bioethics Education on Biomedical Ethics Consciousness, Interpersonal Relationship Empathy and Social Empathy, Critical Thinking Tendency, and Moral Behavior

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Abstract

This study was conducted on nursing college students to investigate the effect on biomedical ethics consciousness, interpersonal relationship empathy, social empathy, critical thinking tendency, and moral behavior after completing the bioethics education program. The data was collected from March 15th to July 15th, 2020, from 46 nursing college students of K University who wished to receive biomedical ethics education and consented to participate in the study. The 16-week bioethics education program was provided, and the effect was measured at 8 and 16 weeks. A total of 183 questionnaire questions consist of biomedical ethics consciousness, interpersonal relationship empathy, social empathy, critical thinking tendency, and moral behavior. The collected data were analyzed using IBM SPSS WIN/25.0. The Shapiro-Wilk test was used to verify the normality of the dependent variable, and. the hypothesis test to confirm the program's Effectiveness was analyzed using mean, standard deviation, paired t-test, and Wilcoxon singed-rank test. As a result of ascertaining the Effectiveness of the bioethics education program, there was a statistically significant difference in interpersonal relationship empathy. Still, there was no statistically significant difference in other variables. To accurately verify the Effectiveness of the bioethics education program, it is necessary to measure the effects before, during, and after the program. Based on this, the data can provide basic information for advancing the program in bioethics education for college students.

Keywords: *Bioethics, Critical thinking, Interpersonal relationships, Moral behavior, Social empathy*

1. Introduction

1.1. Biomedical ethics and nursing

Biomedical ethics is the basis for ethical problem-solving processes directly connected to medical or nursing practices. Establishing more correct values will serve as the driving force for sound decision-making in the healthcare system and will help medical workers. The biomedical ethical issues that nurses face include refusal of treatment, euthanasia, artificial abortion of pregnancy, and timing of discontinuation of therapy, etc. The lack of nursing

Article history:
Received (December 9, 2020), Review Result (January 13, 2021), Accepted (February 16, 2021)

Print ISSN: 2207-3981, eISSN: 2207-3159 IJANER

personnel, organizational culture, and conflict of opinions of patients and guardians in the situation affect ethical judgment or decision-making, leading to ethical disputes [2][3]. Sufficiency of biomedical ethics education, religion, and willingness to participate in education are statistically significant predictors that affect biomedical ethics consciousness [4]. Therefore, a firm ethical value should be established for nursing students, which is possible through repeated learning and education. Among the competencies that need to be developed in university education are consideration and empathy [5]. Empathy is the basis for forming interpersonal relationships. It has been found that if empathic understanding is achieved in relationships, it affects interpersonal relationships by inducing altruistic motives that increase pro-social behavior [6][7]. Nursing students need an opportunity not just to adapt to college life by acquiring empathic attitudes and skills that are the basis of interpersonal relationships but also to prepare for interpersonal relationships and social empathy with patients and other professionals in clinical situations as future nurses [8].

Nursing students are in complex and diverse nursing situations after graduation and must respond creatively and efficiently. A nurse with critical thinking skills is needed in the clinical field as it is necessary to solve problems smoothly through skilled nursing practices and communication [10]. Moral behavior refers to socially desirable behavior in a relationship with others, including help, empathy, protection, sharing, kindness, and cooperation [11]. Nursing students who will become professional nurses need to declare their moral self and moral behavior in college. To meet the needs of the nursing field, it is necessary to cultivate a critical thinking ability to understand and judge various nursing situations efficiently and to develop empathy and moral behavior. It is reported that many of the existing ethical education programs tend to suppress students' creativity and moral development through infusion-type education methods that follow the existing verified knowledge rather than focusing on the problem of value through learning that combines real cases [12].

Therefore, this study aims to provide a bioethics education program to college students and to understand the differences between week eight and week 16 of the program in nursing students' biomedical ethics awareness, interpersonal/social empathy, critical thinking tendencies, and moral behavior.

1.2. Research hypothesis

The hypothesis of this study is as follows.

Hypothesis 1. 'Those who participated in the bioethics education program will have a higher consciousness of biomedical ethics at 16 weeks than at eight weeks.'

Hypothesis 2. ‘Those who participated in the bioethics education program will increase their interpersonal relationship empathy at 16week than 8week.’

Hypothesis 3. ‘Those who participated in the bioethics education program will increase their social empathy at 16week than 8week.’

Hypothesis 4. ‘Those who participated in the bioethics education program will increase their critical thinking at 16week than 8week.’

Hypothesis 5. ‘Those who participated in the bioethics education program will increase their moral behavior at 16week than 8week.’

2. Contents

2.1. Study design

This study is a single-group time-series experimental study investigating the effects of applying the bioethics education program to nursing college students on the subject's biomedical ethics consciousness, interpersonal relationship empathy, social empathy, critical thinking tendency, and moral behavior.

2.2. Participants

This study was conducted with 46 nursing college students who participated in the bioethics education program at C University.

To calculate the effect size, we computed the effect size of 0.43 based on the previous study's findings [13] for the number of study subjects when the paired t-test was performed using the G*power 3.1.9 program. The minimum sample size of 35 subjects was satisfied (effect size d=0.43, significant level(α) .05, power(1-β) 0.8.

2.3. Application of bioethics education program

The bioethics education program of this study is 16 weeks (30 hours)

Session 1	Pre-survey / Orientation	Session 2	Introducing Partners, Question Making Havruta
Session 3	Overview of Biomedical Ethics	Session 4	Bioethics through Case Studies
Session 5	Natural Law Ethics	Session 6	Utilitarianism, Kant's Ethics, Understanding the 4 Principles of Bioethics
Session 7	Teaching Friends Havruta	Session 8	Understanding the ethical dilemma through film
Session 9	Discussion of the ethical dilemma of fertilization and birth and human dignity	Session 10	Understanding of death and the discussion of the ethical dilemma of the death of modern people
Session 11	Cardiac Death, Brain Death, Euthanasia, Dignity Death	Session 12	Surrogate Mother, Abortion, Artificial Insemination
Session 13	Discussion on Organ Transplantation	Session 14	Bioethics Education Through Cases
Session 15	Finishing	Session 16	post-survey

The program of this study was conducted for 2 hours per week, 16 sessions, and 30 hours. As for the teaching method, lectures consist of online lectures and Havruta activity sheets, and discussions consist of pair discussions, group discussions, and whole discussions. In the previous study [14], the composition of the program was verified through a validation study

2.4. Materials and methods

A structured questionnaire was used to verify the Effectiveness of this study, with a total of 183 questions.

2.4.1. Biomedical ethics

The biomedical ethics tool in this study was designed by Lee [15], modified and supplemented by Kwon [16], and a 29-item shortened measurement tool developed by Lee and Moon [17] was used. The biomedical ethics questionnaire is a total of 29 questions. The questions are scored on a Likert 4-point scale. Negative questions were inverted; higher scores mean higher awareness of biomedical ethics. In the study of Kwon [16], Cronbach's α=.76. In the study of Lee and Moon [17], Cronbach's α=.80. The reliability of this study was Cronbach's α=.80.

2.4.2. Interpersonal relationship empathy

The interpersonal relationship empathy tool in this study was developed by Kim and Song [18]. The questionnaire has a total of 19 questions. The questions are scored on a Likert 5-point scale, which means higher empathy. At the time of development of the tool, the reliability of Cronbach's α was .92, and the relationship empathy reliability of this study was Cronbach's α = .96

2.4.3. Social empathy

The social empathy tool in this study was developed by Kim and Song [18]. The questionnaire has a total of 19 questions; the questions are scored on a Likert 5-point scale, and a higher score means higher empathy. At the time of development of the tool, the reliability of Cronbach's α was .92, and the social empathy reliability of this study was Cronbach's α = .95.

2.4.4. Critical thinking tendency

The critical thinking tendency of this study refers to the score measured by the 'K Critical Thinking Disposition Test (KCTDT)' tool developed by Kim [19]. The sub-domains of the tool are value orientation for truth, thoughtfulness, motivation for critical thinking, Verification of evidence/pursuit of accuracy, openness of thinking, Fairness/independence of thinking, intellectual curiosity/persistence, and self-regulation of thinking, consisting of a total of 73 questions. It is a 5-point Likert scale; the higher the score, the stronger the critical thinking ability. At the time of development of the tool, the reliability of Cronbach's α was .92 and, in this study, was .95.

2.4.5. Moral behavior

The moral behavior tool of this study used a tool modified and supplemented by Lee [20] based on a measurement by Kim [21]. A total of 28 questions were asked on a 5-point Likert scale; the higher the score, the higher the moral behavior. In Lee's [21] study, Cronbach α=.92; in this study, Cronbach's α=.94.

2.5. Period and method of data import and ethical considerations

This study collected data on nursing students from March 15th to July 15th, 2020. To protect the subject's autonomy and rights, the researcher explained the purpose of the study, procedures, and guarantees of anonymity, and consent was obtained from the desired subject to participate in the study. It was explained that participation in the study could be abandoned at any time according to their free will, and there was no disadvantage due to abandonment. A

bioethics education program was conducted for 48 people who voluntarily agreed to participate. The first survey was conducted eight weeks after the start of the bioethics education program through a self-written questionnaire, and the second survey was conducted 16 weeks after the program intervention was completed. To protect personal information, the received data is stored numerically, and then the data is stored separately in a lockable storage file. Access is restricted to the researcher. The questionnaire explained that it would be stored three years after the study was completed and then incinerated. It was explained that the personal information and survey data of the subjects involved in the study are numerically secured to ensure confidentiality and anonymity and that they are used only for research purposes. After completing the self-written questionnaire, a total of 46 data were analyzed, excluding two incompletely answered questionnaires among the collected data

2.6. Data analysis

The collected data were analyzed using IBM SPSS WIN/25.0. The Shapiro-Wilk test was conducted to verify the normality of the dependent variable, and the hypothesis test to confirm the program's Effectiveness was analyzed using the mean, standard deviation, paired t-test, and Wilcoxon singed-rank test.

2.7. Result

2.7.1. Verification of normality for the subject's dependent variable

Shapiro-Wilk test was conducted to verify the normality of the subject's biomedical ethics consciousness, interpersonal relationship empathy, social empathy, critical thinking tendency, and moral behavior, and variables excluding social empathy were usually distributed. [Table 1].

Table 1. Regularity verification for dependent variables (N=46)

Variables	Mean±SD	Min	Max	Shapiro-Wilk	*p*
Biomedical ethics consciousness	1,88±0.30	1.27	2.76	.977	.484
Interpersonal relationship sympathy	3.62±0.81	1.37	5.00	.962	.136
Social empathy	3.85±0.80	2.00	5.00	.938	.016
Critical thinking tendency	3.67±0.44	2.85	4.42	.960	.116
Moral behavior	3.82±0.64	2.61	4.93	.953	.064

2.7.2. Effectiveness of biomedical ethics education program

The results of verifying the hypothesis after applying the bioethics education program are shown in [Table 2] and [Table 3], and the hypothesis verification is as follows. Hypothesis 1. 'Those who participated in the bioethics education program will have a higher consciousness of biomedical ethics at week 16 than week 8.' To verify the first hypothesis, the bioethics consciousness of subjects 8 and 16 weeks after application of the bioethics education program was verified by paired t-test. Hypothesis 1 was rejected because there was no statistically significant difference (t=0.05, p=.320). Hypothesis 2. 'Those who participated in the bioethics education program will increase their interpersonal relationship empathy at week 16 than week 8.' To verify the second hypothesis, the interpersonal relations empathy of subjects 8 and 16 weeks after application of the bioethics education program was verified by paired t-

test. Hypothesis 2 was adopted because there was a statistically significant difference. (t=0.34, p=.014).

Hypothesis 3. 'Those who participated in the bioethics education program will increase their social empathy at week 16 than week 8.' To verify the third hypothesis, the Wilcoxon signed-rank test verified the social empathy of subjects 8 and 16 weeks after applying the bioethics education program. Hypothesis 3 was rejected because there was no statistically significant difference (w=.267). Hypothesis 4. 'Those who participated in the bioethics education program will increase their critical thinking at week 16 than week 8.' To verify the fourth hypothesis, the critical thinking tendency of subjects 8 and 16 weeks after application of the bioethics education program was verified by paired t-test. Hypothesis 4 was rejected because there was no statistically significant difference (t=0.06, p=.417). Hypothesis 5. 'Those who participated in the bioethics education program will increase their moral behavior at week 16 than week 8.' To verify the fifth hypothesis, the moral behavior of subjects 8 and 16 weeks after application of the bioethics education program was verified by paired t-test. Hypothesis 5 was rejected because there was no statistically significant difference (t=-0.04, p=.695).

Table 2. Differences in biomedical ethics consciousness, empathy in interpersonal relationships, critical thinking tendency, and moral behavior (N =46)

Variables	1st test (M±SD)	2nd test (M±SD)	A paired t-test (*p*)
Biomedical ethics consciousness	1.88±0.31	1.93±0.29	-0.05(.320)
Interpersonal relationship empathy	3.62±0.81	3.95±0.56	-0.34(.014)
Critical thinking tendency	3.67±0.44	3.61±0.45	0.06(.417)
Moral behavior	3.82±0.64	3.86±0.61	-0.04(.695)

Table 3. Differences in social empathy (N =46)

Variables	1st test (M±SD)	2nd test (M±SD)	Wilcoxon*
Social empathy	3.85±0.80	4.01±0.54	.267

**Wilcoxon signed-rank test*

3. Conclusions

This study is a primitive experimental study consisting of a single-group time-series study to understand the effects on biomedical ethics consciousness, interpersonal relationship empathy, social empathy, critical thinking tendency, and moral behavior by applying the bioethics education program for nursing college students. As a result of verifying the Effectiveness of the bioethics education program, there was a statistically significant difference in interpersonal empathy. Still, there was no statistically significant difference in other variables. This is the result of confirming the continuity of the educational effects after training, and it isn't easy to compare directly with the results of the program effectiveness verification of prior research. In this study, there was no difference in the results of educational effects immediately after and four weeks after education, except for the ability to have interpersonal relationship empathy. Therefore, it is confirmed that the impact of education continues. To accurately verify the Effectiveness of bioethics education, it is necessary to verify the effect by checking the results before, during, and after, and it is expected that it can be used as primary data for the advancement of the program of bioethics

education for college students. Also, it is expected to be used to cultivate awareness of biomedical ethics. This study was conducted under a non-face-to-face condition due to COVID-19. The Havruta teaching method and pair discussions are expected to be more effective in a face-to-face environment with the same contents, so replication studies in a face-to-face condition are recommended. Also, since the following research was conducted at a single university in a localized region, there are limitations in generalizing the study's results. Therefore, replication studies with expanded areas are suggested.

Acknowledgments

This research was conducted as a research project of the Korea Research Foundation. (NRF-2019R1G1A108915412).

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