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The Impact of Anatomy Learning Using Cadaver in Nursing Students

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Abstract

Background/Objectives: *The purpose of this study was to investigate the change of perception of nursing students due to the education using cadaver.*

Methods/Statistical analysis: *We analyzed a group of 60 second-year nursing students before and after attending the cadaver practice. Each sheet contained demographic questions, a visual analog scale on stress(VAS), Interest in anatomy, changes in attitude statement and Emotional response to the dissection after anatomy learning using cadaver. We analyzed the collected data in terms of frequency, percentage, mean and standard deviation. All statistical analyses were carried out using SPSS software version 23.*

Findings*: The results were mostly positive as students stated the lectures 'helped to understand the body structure' and influenced them to become 'interested in anatomy'. In addition, there were many students who wished to participate again in anatomy learning using cadaver. It has also been found that lectures with bodies increase students' interest and understanding of anatomy learning and positively affect their emotional attitudes.*

Improvements/Applications*: We suggest that anatomical studies for nursing students should have a separate curriculum with the body.*

Keywords: *Anatomy learning, Cadaver, Nursing students, Attitude statement, Emotional response*

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1. INTRODUCTION

Normally, medical school students receive the opportunities to face their fear and anxiety of death during cadaver practices. In addition, cadaver practices are strongly supported and preferred to provide students with professional training and develop professional skills as doctors[1]. There are lectures use cadaver during anatomy lectures, which are compulsory for medical students. However, most nursing students are only given theoretical lectures in Korea, and are rarely given opportunities to experience cadavers. Death management and care for dying patients are important and critical within the responsibilities of nurses as well as doctors[2]. Although experiences of cadaver practices are extremely important for nursing students, most students do not receive the opportunity to participate in the cadaver practice curriculum until they are placed in the clinical

field. Therefore, nursing students lack the skills to handle deceased patients due to the lack of experiences with the subject of death[3].

Anatomy and physiology is one of the subjects with the most difficult concepts that nursing students are required to learn through lectures. Many students should make efforts to understand the major concepts[4,5]. As cadaver practices provide the fundamentals of nursing within anatomy and physiology, they are necessary to develop critical thinking skills based on nursing skills and clinical practice[6,7]. Effective nursing teaching methods should provide hands-on experience within an environment for emotional learning[8]. Cadaver practices allow the students to not only acquire knowledge on the actual human body but also experience different aspects including the emotional attitudes on the life and death of humans[9]. Recently, the number of anatomy practices decreased due to religious beliefs, as well as cost- and time-related factors[10,11]. Although the human corpse had been used as a major teaching tool for hundreds of years, there are different opinions on whether a complete human body dissection is still appropriate for undergraduate curriculums of the modern society[11]. In addition, exposure to deceased patients may lead to physically (odor, nausea) and psychologically (stress, emotional trauma) negative effects[1,10]. Further, as practices may lead to ideation on their own deaths, they may be fearful and painful experiences for nursing students[12,13]. Since 2010, there have been active international studies on anatomy learning using cadavers or the attitudes of students towards the anatomy of the human corpse for nursing students. Such studies include the study on the preference levels of healthcare students on anatomy teaching methods, descriptive research on the history of anatomy lectures, and a study on the change of the student's identity before and after anatomy practices[1-5, 9]. However, there is a limited number of studies on various topics in Korea. Therefore, this study aimed to investigate the awareness and the various emotional attitudes of nursing students on anatomy learning using cadaver within the anatomy curriculum.

2. MATERIALS AND METHODS

2.1. *Research design*

This study is a descriptive research to identify the stress and awareness of nursing students on cadaver practices. The 60 students who agreed to participate in the study responded to a survey and were given a class on ethics before participating in the cadaver practices. The students then responded to the survey again after participating in the practices.

The students were divided into two teams of 30, and each team participated in 14 hours of cadaver practices in January 2019 over two days. The cadaver practices were administered in a cadaver practice room within the anatomy research center of C University Hospital of S City. The lectures were provided by two professors from the anatomy research center of C University. The practice curriculum included seven hours of lectures centered on the nerves, blood vessels, and muscles on the first day, and seven hours centered on the organs within the chest, abdomen, and pelvis on the second day.

2.2. *Research Tools*

2.2.1. General characteristics of the subjects

We used gender, age, and religion to identify general characteristics.

2.2.2. Stress

The visual analogue scale (VAS) was used for stress. This tool is a measurement instrument that tries to measure a characteristic or attitude that is believed to range across a continuum of values and cannot easily be directly measured. It is often used in epidemiologic and clinical research to measure the intensity or frequency of various symptoms[10].

2.2.3. Attitude states and Emotional response

In this study, the researcher modified and supplemented the version of 'Questionnaire comprised of 26 attitude states on necropsy VAS 100mm' developed by Botega et al. (1997) with the Likert 5-point scale by Oh song lee (2010). The scale was measured with 5 points scale with 11 questions in the domain of 'general attitude toward cadaver practice', 2 questions in the domain of 'dead family and rapport', and 4 questions in the domain of 'emotional response to the practice of cadaver anatomy'

The total opposition was 5 points, 'complete opposition' was 5 point, 'almost opposition ' was 4 points, 'neutral' was 3 points, 'almost agreement' was 2 points, and 'complete agreement' was 1 point. The higher the score, the more positive the attitude toward the practice of the cadaver dissection.

2.3. Data Analysis

The data were analyzed using the statistics program SPSS for Windows ver. 23.0, and the study methods were as follows. First, the study used frequencies and percentages to identify the general characteristics of the participants and the characteristics related to dissection practices. Second, percentages were used to assess the participants' awareness on the anatomy lecture use cadaver. Third, the attitude and emotional response of the participants after the anatomy lecture were assessed by calculating the means and standard deviation.

2.4. *Ethical Consideration*

The students learned the purpose and procedure of the study and obtained written consent from the informant.

3. Results And Discussion

The general characteristics of the participants are shown in Table 1. Out of the study participants, there were more female students than male students. There were 51(85.0%) females and nine(15.0%) males. More participants were not religious, as 18(30.0%) were religious and 42(70.0%) were not religious. The age of the participants ranged from 18 to 34, and the mean age was 20.3(±2.67).

Table 1: Demographic characteristics of the students (N=60)

Characteristics	Division	N	%
Sex	Male	9	15.0
	Female	51	85.0
Religion	No	42	70.0
	Yes	18	30.0
Age(years)	Range 18~34, Average 20.3		

Table 2 shows the students' awareness before taking the anatomy lecture use cadaver. The most common response on the needs questionnaire of anatomy practices within the nursing curriculum was "needed" with 32(53.3%) responses. Thirty-nine(65.0%) responded that anatomy practices will be "helpful" within the nursing

curriculum, and 16(26.7%) responded 'greatly helpful.' In terms of whether the students wish to sign up to donate their corpse before and after the anatomy practices, the most common responses were "I may sign up to donate my corpse in the future" and "I wish to sign up, but I need more information" with 21(35.0%) responses each. In addition, 14(23.3%) students responded that they "do not wish to sign up." Twenty-two(36.7%) students had experienced deaths of a person around them over the past two years, and 38(63.3%) students had not. In terms of trauma related to the deceased, 36(60.0%) students had not seen a dead body, and 24(40.0%) had seen a dead body but did not have, or had only slight traumas. Stress levels on anatomy practices were distributed from zero and eight, and the mean stress level was 2.88 (standard deviation ±2.06). In terms of the responses on what is most helpful to understand the body structure, 33(55.0%) students responded that "It is necessary to use the human corpse for anatomy practices" and 13(21.7%) responded that "there are limits to learning with plastic models or pictures." Twenty-eight(46.7%) students responded that there should be more anatomy practices (number of times, hours, etc.) to better understand the human body structure.

Table 2. Awareness before Anatomy Learning Using Cadaver (N=60)

Question	Division	N	%
Necessity in nursing curriculum	Not at all	0	0
	Not so much	0	0
	Ok	12	26.7
	Needed	32	53.3
	Extremely needed	16	26.7
Assistance of nursing education	Not at all	0	0
	Not so much	0	0
	Ok	5	8.3
	helpful	39	65.0
	Greatly helpful	16	26.7
I wish to sign up to donate their corpse after the anatomy learning	Do not wish to sign up	14	23.3
	I may sign up to donate my corpse in the future	21	35.0
	I wish to sign up, but I need more information	21	35.0
	Absolute sign	3	5.0
	Already signed	1	1.7
Experienced deaths of a person around them over the past two years	No	38	63.3
	Yes	22	36.7
Trauma related to the deceased	Never seen	36	60.0
	Seen dead but no trauma/week	24	40.0

	Seen dead and have trauma	0	0
Stress degree(point)	Range 0~8, Average±SD 2.88±2.06		
Helpful to understand the body structure	Limits to learning with plastic models or pictures	13	21.7
	Learning from plastic models or drawings helped	8	13.3
	Unknown	4	6.7
	Necessary to use the human corpse for anatomy practices	33	55.0
	Must use the body through anatomy exercises	2	3.3
Necessity more anatomy practices to better understand the human body structure	Not at all	0	0
	Not so much	6	10.0
	Ok	25	41.7
	Useful	28	46.7
	Extremely useful	1	1.7

The students' awareness after anatomy learning using cadaver after participation is shown in Table 3. In terms of the responses to whether the anatomy practice helped them understand body structure, 41(68.3%) responded "helpful," and 14(23.3%) responded "extremely helpful." In terms of the responses to whether the anatomy practice raised interest in anatomy, 39(65.0%) responded that they became "interested," 13(21.7%) responded "extremely interested", 7(11.7%) responded "normal interest," and one (1.7%) responded "not interested." In addition, in terms of the responses to whether the students will participate again in anatomy learning using cadaver in the future, 30(50.0%) responded "yes," (13.3%) responded "definitely yes," 20(33.3%) responded "not sure," and one(1.7%) each responded to "no" and "definitely no."

Table 3. Awareness after Anatomy Learning Using Cadaver (N=60)

Question	Division	N	%
Helping you understand body structure	Not at all	0	0
	Not so much	0	0
	Normal	5	8.3
	Helpful	41	68.4
	Extremely helpful	14	23.3
Interest in anatomy after anatomy learning using cadaver	Not at all	0	0
	Not interested	1	1.7
	Normal interest	7	11.7
	Interested	39	65.0

	Extremely interested	13	21.7
Participate again in anatomy learning using cadaver in the future	Definitely no	1	1.7
	No	1	1.7
	Not sure	20	33.3
	Yes	30	50.0
	Definitely yes	8	13.3

Table 4 shows the attitude and emotional response of the students after their participation in the anatomy learning using cadaver. Among the general attitudes, the item with the highest score was "I hope I never have to see a (another) dissection." with a score of 4.19(±.75). In terms of emotional response, the item with the highest score and the most positive reaction was "Even if it seems strange to scientists, I believe that the dead person may suffer during the necropsy." with a score of 3.65(±.76). Out of the 12 items, the item with the most negative reaction was "I would rather attend the dissections of an unknown person than of a patient of mine." with a score of 2.12(±.83). These results show that anatomy learning using cadaver positively affect students.

Table 4. Attitude statement and Emotional response after Anatomy Learning Using Cadaver (N=60)

Question	Mean(±SD)
Attitude statement	
1. Modern advances in diagnostic techniques have decreased the need for dissections.	3.45(±.68)
2. In order to assess the quality of diagnoses and treatments, dissections should be routinely and systematically performed in every main hospital.	2.58(±.69)
3. I prefer to look at colored and histological slides of diseases rather than attend dissections.	3.53(±.70)
4. If it were possible, I would sign the death certificate in order to avoid the dissection of a relative of mine.	3.03(±.67)
5. I hope I never have to see a (another) dissection.	4.19(±.75)
6. It is more painful to see a dissections of a child than of an adult.	3.08(±.96)
7. The smell of the necropsy room is disgusting.	2.85(±.79)
8. I am worried that my dead relative's body can be treated carelessly while a dissections is being conducted.	2.47(±.85)
Emotional response to the dissection	
9. Violate the reverence for the dead.	3.37(±.76)

10. The sight of the body during dissection is horrifying to me.	3.60(±.81)
11. Even if it seems strange to scientists, I believe that the dead person may suffer during the necropsy.	3.65(±.76)
12. I would rather attend the dissections of an unknown person than of a patient of mine.	2.12(±.83)

This study aimed to investigate the effects, attitudes and emotional responses of nursing students when providing them with anatomical knowledge through lectures use cadaver. The results were mostly positive as students stated the lectures "helped to understand the body structure" and influenced them to become "interested in anatomy" (97.6% and 81.7%, respectively). In addition, there were many students who wished to participate again in anatomy learning using cadaver with 63.3%.

Many anatomists prefer the use of cadavers over other teaching tools. A study that identified the awareness of medical students on anatomy learning showed that the students strongly preferred the use of the human corpse in anatomy learning[11]. In contrast, there is controversy over whether it is appropriate to use a complete cadaver for undergraduate curriculums of the modern times[17]. Using cadavers is considered to be costly, time-consuming, and an outdated practice[18].

Although it is recommended for nursing students to participate in the direct observation of cadavers within anatomy lectures, it is not compulsory. This study conducted anatomy learning using cadavers for nursing students. The study results are significant as the lectures improved the students' interest in anatomy, and also showed positive results in their attitudes towards practices use cadaver. As with any other curriculum, anatomy learning should be continuously and thoroughly edited and analyzed to determine the most appropriate teaching tool and approach.

The VAS scale used in the study is normally used to assess pain and stress, especially within the workplace [14]. Although it was not used for such purposes in this study, it seemed appropriate to evaluate psychological preparedness in terms of anatomy learning using cadaver. The results of the study showed that there are no differences in the students' stress levels and attitudes towards anatomy practices before participating in anatomy learning between genders (not shown in tables). These results are different from those of prior studies on the stress levels of students before anatomy learning using cadaver. The study from 1997 revealed that there are differences in the stress levels between male and female students. Dickinson reported that female students showed greater fear and physical and behavioral responses during anatomy practices[15]. Abu-Hijleh also reported that female students had greater death anxiety than male students during anatomy practices[16].

There are some factors that can explain such differences. First, although the assessment tools used are similar, the results are difficult to compare as the times of evaluation using VAS are different. Second, another factor that will affect the results is whether student participation is voluntary or involuntary. In prior studies, the medical students involuntarily participated in lectures use cadaver as a compulsory course. However, in this study, student participation was voluntary. Therefore, the probability that the students may be more passionate should not be disregarded.

Computer-based learning is recently becoming more widely used to promote the learning process of the anatomy curriculum due to technological development and the increasing costs of cadavers[19]. However, students still prefer the traditional methods of anatomy learning and practices over computer-based learning in terms of anatomy studies[20,21]. The results of the study showed that cadaver practices change the awareness

and attitude of nursing students' who study anatomy on the subject of death. This change allowed the students to put more emphasis on the attitudes towards the corpse as a tool of anatomy learning and overcome difficulties in understanding anatomy.

In terms of the students' willingness to donate their corpse, the study results showed the most number of students (35%) who wished to sign up to donate their corpse before they participated in the cadaver practice. However, as the students took a neutral attitude after the cadaver practice, it was revealed that it is necessary to develop a more accepting attitude towards donating their corpse and conducting an autopsy. However, the brief, two-day timeframe for the practice should be considered, and the attitudes of the students may be natural within the process of observing the parts of the human body in detail. Before participating in the cadaver practice, the students were given lectures on ethics, and they solemnly and quietly participated in the practice. Anatomy learning using cadaver are programs that are intended to teach students how to practice on a human corpse. Therefore, it was identified that there should be greater sensitivity and careful attention devoted to ethical education and the observance of noble attitudes associated with corpse donations along with the practice itself.

4. CONCLUSION

This study analyzed the awareness of students on cadaver practices before their participation in the practice and their awareness and emotional attitudes after participation. The purpose was to suggest the effects of lectures use cadaver within the anatomy lectures. As a result, it was revealed that the lectures use cadaver increased the students' interest and understanding of the anatomy lectures, and positively affected their emotional attitudes.

In conclusion, there should be a separate curriculum use cadaver within the study of anatomy for nursing students. Furthermore, the effectiveness of the curriculum should be continuously and thoroughly evaluated for improvement.

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