

Qualitative content analysis of journals of cadaver practice experiences in nursing students

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Abstract

This study attempted to identify the experiences of nursing students' participation in cadaver practice and provide a basis for understanding students' experiences in cadaver practice, which can be reflected in the development of programs for them. By applying the content analysis method according to the guidelines by Krippendorff to analyze the meaning of the experience of participating in cadaver practice among 80 nursing students who participated in cadaver practice at K University in W-si, Gangwon-do, a total of 4 areas, 13 categories, and 25 meaningful statements were derived. The categories included "worried," "surprised," and "fear" in the anxiety domain; "interesting," "knowing," and "focused" in the immersion domain; "value of life," "gratitude and remembrance," "thinking about donation," "facing death," and "precious body" in the reflection domain; and "motivation" and "sense of accomplishment" in the growth domain. The results of this study will help to understand the physical and psychological reactions that nursing students may experience during cadaver practice, and will provide a basis for developing various strategies such as counseling, education, and reflection programs in conjunction with cadaver practice to help nursing students cope with stress, develop a sense of ethical responsibility, and develop a positive self-image as nursing students in order to be successful in cadaver practice. This study is also significant because it provides a basis for preventive program interventions for experiences related to the negative effects of cadaver practice.

Keywords: *Cadaver, Content analysis, Experiences, Journals*

1. Introduction

With the rapid development of science and technology and medical technology, medicine has made remarkable progress, and it is becoming increasingly important for medical personnel who deal with life to acquire in-depth knowledge of the human body [1]. In particular, nurses are professionals who are engaged in healing patients' diseases based on in-depth knowledge of the human body, and this knowledge of the human body is learned through mandatory subjects, especially anatomy, which is basically based on medical laws and regulations related to national examinations [2].

Anatomy, a fundamental subject for nursing, is usually taught in the first or second year, and students who complete a major in a university without a medical school inevitably receive hands-on training in human

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anatomy only through lecture-based education using textbooks, anatomical diagrams, and human models, making it very difficult to accurately understand the structure of the human body in three dimensions [1]. To compensate for these limitations, digital convergence educational media such as computer-based video production and simulation technology are being utilized, but the introduction of such teaching and learning methods does not always reach the best educational goals, so the most effective education would be cadaver practice in parallel with anatomy theory classes [3]. In cadaver practice, the human body can be seen and touched with real eyes, and the structure and function of each organ can be clearly understood. Therefore, recently, some nursing schools have been conducting cadaver training in cooperation with anatomy departments of medical schools at home and abroad, but there are not enough schools that can support training compared to the demand for training, so various training times and methods are conducted according to the actual situation of each nursing school [4, 5].

Among the qualitative studies on cadaver training, there are a few studies that analyzed medical students' anatomy education experiences through interviews [6], focus interview studies on nursing students' cadaver training experiences [7,8], and content analysis of nursing students' cadaver training journals [9,10]. However, the length of cadaver practicum in previous studies of nursing students varied from 4 hours to 72 hours, and it is important to replicate the experience in different cadaver settings and programs. In addition, nursing students who encounter death for the first time through cadaver before encountering dying patients in clinical practice in their second and third years have a unique opportunity to reflect on life, death, human dignity, and bioethics related to body and organ donation [7]. There is a lack of research that examines the meaning that nursing students attach to their first encounter with cadaver through their anatomy experience. Phenomenological research to explore and understand the thoughts and feelings formed during nursing students' cadaveric experiences focuses on describing the meaning of multiple individuals' lived experiences with a concept or phenomenon. A qualitative content analysis study is an objective, systematic, and quantitative description of written data, such as transcripts of interviews or journals, and can use both quantitative and qualitative methods of analysis. In the previous study, the number of participants varied from 20 to 169, and the details of the practical training during the three-day training period were different. Against this background, analyzing and understanding the experience of 80 nursing students' four-day cadaver anatomy training using the qualitative content analysis method can provide basic data for the operation of customized cadaver training programs in nursing departments and education on bioethics and nursing ethics based on the results of this study.

2. Purpose of the study

The purpose of this study is to explore the essence of cadaver practice experience by understanding and analyzing the meaning of cadaver practice experience based on the practice journals kept by nursing students during cadaver practice education. These results are intended to be used as a basis for developing a cadaver practice program for nursing students.

3. Limitations of the study

As this study involved nursing students at a university in W-si, Gangwon-do, it is necessary to be cautious about extrapolating the results to all nursing students.

4. Research methods

4.1 Research design

This is a qualitative study of nursing students' experiences with cadaveric anatomy labs and is an exploratory study that analyzes the content of participant-narrated lab journals to understand and describe the meaning of the phenomena experienced by the participants.

4.2 Participants

The participants of this study were a total of 80 nursing students who understood the purpose of this study and agreed to participate in the cadaver practice program during winter break after taking an anatomy course in the second semester of their first year in W city, Gangwon province. The schedule of the cadaver practice program was arranged by the anatomy classroom of the School of Medicine, S University, Shanghai, China, and consisted of anterior trunk and anterior upper limb on day 1, posterior trunk and anterior lower limb on day 2, posterior upper limb and lower limb on day 3, and dissection and observation of internal organs and brain on day 4.

The calculation of the sample size was based on Krippendorff's theory, which states that the purpose of qualitative content analysis is transferability, not generalization, so the citation of examples that support the topic serves as the sample [11]. Transferability refers to determining whether the results of one context can be applied to other studies. On the other hand, the previous study of qualitative content analysis of cadaver practical training was calculated based on the results of 20 participants in a qualitative content analysis study of practical journals [12]. Therefore, the sample size of this study meets the sample size of qualitative content analysis of practical journals.

4.3 Data collection

For this study, 80 second-year nursing students participating in cadaver practical training were explained the purpose and method of the study, and consent to participate in the study was obtained. The data collection period was from January 10 to January 13, 2020. During the four days of the cadaver practical training, participants were asked to freely describe their experiences, physical and psychological reactions, and overall impressions of their participation in the training, which were submitted anonymously. Written data was collected on the evening of each of the four days of training by asking participants to record and submit their responses on an A4 sheet in a private and comfortable place. The students were asked to record at least 0.5 A4 sheets per day per person, with an average of 2 sheets per participant, and a total of 160 sheets were collected and used for data analysis.

4.4 Research ethics

Written informed consent was obtained from each participant to ensure ethical consideration of the research participants. The researcher explained the purpose and methods of the study in advance, and informed the participants that the results would not be used for any purpose other than the purpose of the study, that the contents would be kept absolutely confidential, and that they could refuse or discontinue the study at any time if they wished.

4.5 Data analysis

We conducted a qualitative contents analysis, a type of qualitative research that involves analyzing, coding, and categorizing narrative data from participants [13].

In this study, every day during the 4-day training period, participants were asked, "Please feel free to

describe how you felt and what you thought after participating in the cadaver hands-on training." The participants were asked to write freely and anonymously on an A4 sheet of paper.

Step 1 of the analysis is to identify meaningful words, the unit of analysis, in the raw data. In this study, the four areas of analysis were identified as 'anxiety', 'immersion', 'reflection', and 'training' through the literature related to nursing students' experience of observing human anatomy [9, 12], and the units of analysis were set as phrases and sentences, and in the process of repeatedly reading the contents of the diary, relevant meaningful phrases and sentences were crossed out, and the four areas were set as 'anxiety', 'immersion', 'reflection', and 'growth' in the process of rewriting the crossed out contents so that the original meaning was not lost. We identified meaningful units of analysis in the majority of the journals and found no exceptional cases of contradiction.

In step 2, we categorized the units of analysis and arranged them inductively. The process of consolidating similar content was repeated to select 42 phrases and sentences with the same meaning. The 42 selected phrases and sentences were repeatedly read and categorized by collecting similar contents, and the phrases and sentences included in the same category were re-compared and reviewed, and 13 final categories were derived.

Finally, the final 25 phrases and sentences were selected as representative statements by combining similar phrases and sentences in the categories, and the phrases and sentences corresponding to each statement were quantified.

This researcher has published qualitative research articles after taking a course on qualitative nursing research methods and attending a workshop on writing qualitative research articles. For the reliability and validity of the qualitative data analysis, two nursing professors who have published many qualitative research papers were consulted and checked throughout the analysis process.

5. Results

5.1 General characteristics of the study participants

Of the 80 second-year nursing students who participated in the study, 92.5% (74) were female and 7.5% (6) were male, and 66.3% (53) had no religious affiliation, more than those who did (33.8%). All participants were new to the cadaver lab, and a total of 160 journals were used to analyze the qualitative data.

5.2 Nursing students' experiences participating in cadaver practicum

Content analysis of the participants' reflective journals during the cadaver practicum, categorized into four areas: anxiety, immersion, reflection, and growth, yielded a total of 25 meaningful statements and 13 categories. Here are the specific findings.

5.2.1 Anxiety domain

In the anxiety category of the study participants' cadaver hands-on experience, 3 themes and 7 meaningful statements were derived, and the total number of statements was 73. The themes analyzed were worried (46.6%), surprised (43.8%), and afraid (9.6%). The most common statements for each theme were "I am worried about the situation of facing a dead body (15)," "I was surprised when I saw the internal organs on the cadaver (21)," and "I am afraid of the practice because I was not prepared for the practice (study and psychological state) (4)" (Table 1).

Table 1. Scope of anxiety

Categories	Significant statements(n*)	n*(%)
Worried	I am worried about having to face a dead body. (15)	34(46.6)
	I've heard that the formalin smell is disgusting and I'm not sure I can handle it. (12)	
	I'm worried about whether I'll be able to do a good job in the cadaver practice. (7)	
Surprised	I was surprised to see the internal organs I had read about in books in person with a cadaver. (21)	32(43.8)
	I was surprised to see the external appearance of the cadaver. (11)	
Fear	I am afraid of the lab because I am not prepared for it (studying and psychological state). (4)	7(9.6)
	I'm scared because I haven't experienced death around me. (3)	
	Total	73(100.0)

* Multiple response

5.2.2 Immersion domain

The immersion category of the study participants' cadaver hands-on experience yielded three themes, seven meaning statements, and a total of 63 statements. The themes analyzed were interesting (55.6%), learned (36.5%), and focused (7.9%). The most common statements in each category were "Interesting" (18), "It was an experience that filled in the gaps of the theory class that I had studied only in books" (18), "Learned" (13), "I will remember the contents of the cadaver lab for a long time" (13), and "Focused" (3) (Table 2).

Table 2. Scope of immersion

Categories	Significant statements(n*)	n*(%)
Interesting	The experience filled in the gaps of the theory class that I had studied only from books. (18)	35(55.6)
	I was fascinated by the functions, connections, and relationships of each internal organ. (14)	
	It was interesting to see the human anatomy for the first time in my life. (3)	
Learned	The cadaver practice will be memorable. (13)	23(36.5)
	I learned the principles of anatomy. (10)	
Focused	I look forward to the next practice. (3)	5(7.9)
	The practice time went by very quickly (2)	
	Total	63(100.0)

* Multiple response

5.2.3 Reflexion domain

In the reflection category of the study participants' cadaver practice experience, five themes and seven

meaning statements were identified, and the total number of statements was 41. The themes analyzed were: value of life (31.7%), gratitude and remembrance (26.8%), thinking about donation (19.5%), facing death (17.1%), and precious body (4.9%). For each topic, the most common statements were "I understood why the word 'mystery' was used for the human body (11)" for 'Value of life' and "I practiced with gratitude for the person who donated the body (11)" for 'Gratitude and memorialization', "Thinking about donation" made me think seriously about organ donation or body donation (8), "Facing death" made me feel cautious about handling the body (4), and "My precious body" made me think about how to take care of my body to make it healthy (2) (Table 3).

Table 3. Scope of reflexion

Categories	Significant statements(n*)	n*(%)
The value of life	I understood why the word "mystery" was used to describe the human body. (11) I was reminded of the importance of life. (2)	13(31.7)
Gratitude and memorialization	I practiced being grateful to the person who donated the body. (11)	11(26.8)
Thinking about donation	It made me think seriously about organ or body donation. (8)	8(19.5)
Facing death	I was cautious about handling a dead body. (4)	7(17.1)
My body is precious	I was no longer afraid of death. (3) I thought about how to take care of my body to keep it healthy. (2)	2(4.9)
	Total	41(100.0)

* Multiple response

5.2.4 Growth domain

The growth category of the study participants' experience with cadaver yielded 2 themes, 4 meaningful statements, and a total of 33 statements. The themes analyzed were motivation (54.5%) and fulfillment (45.5%). The most common statements for each theme were "I was motivated to study nursing hard" (16) and "I was proud of myself for completing the practicum" (12) (Table 4).

Table 4. Scope of growth

Categories	Significant statements(n*)	n*(%)
Motivation	I am motivated to work hard on my nursing studies. (16) It made me plan my future as a nurse. (2)	18(54.5)
Sense of accomplishment	I was proud of myself for completing my practicum well. (12) I feel like I can do any job well. (3)	15(45.5)
	Total	33(100.0)

* Multiple response

6. Discussion

This study attempted to broaden the understanding of nursing students' experiences of participating in a cadaver practicum by analyzing the areas of anxiety, immersion, reflection, and growth in the cadaver practicum experience using the content analysis method.

The anxiety experienced by the study participants was characterized as 'worried', 'surprised' and 'fearful'. This was similar to the findings of several studies [9, 12] that found that students experienced anxiety, fear, and sadness after the cadaver practicum. Participants in this study reported high levels of "worried" in the anxiety domain, indicating that they were concerned about encountering a dead body, the smell of formalin, and whether they would be able to perform well in the cadaver. Previous research [12] has confirmed that students who are worried about their ability to perform the cadaver practice are more likely to be worried about not being able to anticipate specifically what they will see and not having enough prior learning to understand the educator's explanations. These findings are similar to Kim and Chae's [9] findings of 'unfamiliar waiting', 'vague journey', and 'ambivalence on the road', and suggest the need for an effective orientation that emphasizes sufficient prior learning and provides a detailed schedule and content before the cadaver practice. Among the anxiety domains, 'worried' was followed by 'surprised' and 'fear', which was reported by several studies [9, 12] including the concepts of fear, nervousness, and anxiety. It can be seen that the "fear" felt by students during the cadaver lab is not just fear, but an ambivalent emotion that also includes anticipation. Yerkes and Dodson [14] found that performance under stress follows an inverted U-shape, suggesting that moderate levels of tension or anxiety can increase achievement and satisfaction. This suggests that it is necessary to encourage and guide students who are under moderate levels of tension and stress to gain more knowledge about human anatomy.

The study found that participants experienced the most "excitement" in the immersion zone during the cadaver lab. They experienced a sense of wonder and excitement as they dissected and touched internal organs that they had only studied in books. A second category of "knowing" was identified, which is thought to be the participants' perception of professional and practical learning and knowing. In addition, as the cadaver practice progressed, the participants gradually became more immersed and familiar with the situation, and it is believed that the process of writing a practice journal in this study, which they were asked to write during this period of rapid change, was not only used for content analysis, but also as a psychological intervention for the participants by encouraging them to express their feelings during the anatomy practice. The last category was 'concentrated', which was categorized as 'immersed in the practice' in Kim and Chae's [9] study, including the concepts of 'effort to melt in' and 'relative familiarity', which showed a similar context to the results of this study. In addition, in another study [12], the participants were immersed in the cadaver practice and experienced that they could only see the organ being taught and hear the educator's explanation and voice.

In the area of reflection, it was analyzed as 'the value of life', 'gratitude and remembrance', 'thinking about donation', 'facing death', and 'my precious body'. It can be seen that the participants in the study grew through reflection by thinking about life and death, the meaning of body donation, and the question of whether or not to donate, which they did not usually think about. We believe this experience will help them resolve ethical conflicts related to biomedical care in the future. Participants also experienced a shift in perception as they thought about their gratitude for the cadaver donors and their selfless lives. Respectful language, such as referring to cadaver as "silent teachers" [15] and "silent mentors" [16-18] rather than as mere anatomical specimens, has been shown to have a positive impact on medical students' attitudes toward cadaver [19]. The "silent mentor" initiation ceremony has been shown to help develop more positive attitudes toward death, reduce negative feelings toward cadaver, and improve learning [16-18]. It has been emphasized that the

dissemination of such rituals into the community will improve awareness and acceptance of cadaveric donation, and that it is crucial to develop not only knowledgeable and skilled healthcare workers, but also healthcare workers who are compassionate and empathetic towards patients and society at large [18]. Therefore, it is recommended that time be allocated during the cadaver training course to promote reflection on life and death and to discuss cadaver and organ donation. cadaver practice can help develop a proper perception of death, and if educational programs are developed and applied to form positive values about death, nurses who recognize that death is a process of life in a broad sense can be developed to provide holistic care. The study participants realized the mystery of the human body and the importance of life and vowed to take care of their physical and mental health.

In the area of growth, they were analyzed as experiencing 'motivation' and 'fulfillment'. They were motivated to study and envisioned their future nursing careers. The experience of participating in cadaver practice seems to be an important training process for nursing students who will grow into professional nurses. Even though the experience was limited to observation or some contact in some cases, the physical and psychological tension and vibration experienced by the participants made them reflect on the value of life and the meaning of life and death beyond practice. We also found that the nursing students redefined their professional identity as professional nurses by pondering their future relationships with patients, showing respect and empathy for them. Self-efficacy, which is the sense of being able to do something well, can be enhanced with more first-hand experience and stronger subject knowledge.

7. Conclusion

This study attempted to identify nursing students' experiences of participating in cadaver practice and provide a basis for understanding students who participated in cadaver practice, which can be reflected in the development of programs for them.

A total of 80 nursing students at K University in W-si, Gangwon-do who participated in the cadaver practice applied the content analysis method to analyze the meaning of their experience of participating in the cadaver practice, and a total of 4 areas, 13 categories, and 25 meaningful statements were derived. The categories included "worried," "surprised," and "afraid" in the anxiety domain; "interesting," "knowing," and "focused" in the immersion domain; "value of life," "gratitude and remembrance," "thinking about donation," "facing death," and "precious body" in the reflection domain; and "motivation" and "sense of accomplishment" in the growth domain.

The results of this study will help to understand the physical and psychological reactions that nursing students may experience during cadaver practice and will provide a basis for designing various strategies such as counseling, education, and reflection programs in conjunction with cadaver practice to help nursing students cope with stress, develop a sense of ethical responsibility, and a positive self-image as nursing students in order to be successful in cadaver practice. This study is also significant because it provides a basis for preventive program interventions for experiences related to the negative effects of cadaver practice.

This study is a content analysis of practice journals, which may be limited in its ability to provide an in-depth understanding of participants' experiences. Therefore, we recommend further qualitative research with different approaches to explain the meaning of events and experiences that affect human existence, life, and perception.

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