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E-mail: bun8973@naver.com

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Effects of a Wonderful Life Program on the Wellbeing Behaviors, Life Satisfaction and Subjective Quality of Life of Community Elderly People in KOREA: Wonderful Life Program Includes SAFETY

Byeon Mi-kyeong[1]
Songho University, Hoengseong, Republic of Korea
Park Sun-jung[2*]
Yeoju Institute of Technology, Yeoju, Republic of Korea
Choi Eun-young[3]
Kyungdong University, Wonju, Republic of Korea

Abstract

The purpose of this study was to examine the wellbeing behaviors, life satisfaction and subjective quality of life of community elderly people and to verify the effectiveness and usefulness of a wonderful life program provided for successful life in old age. This study made an attempt to examine the wellbeing behaviors, life satisfaction and subjective quality of life of community elderly people and to verify the effectiveness and usefulness of the wonderful life program so that community elderly people could lead a successful life in old age. This study is a quasi-experimental research that adopted nonequivalent control group pretest-posttest design to determine the effects of the wonderful life program on wellbeing behaviors, life satisfaction and the subjective quality of life after offering it to the selected community elderly people. We selected 30 people who were given permission from elderly people over 65 years of age at the social welfare center in W city. In the homogeneity test, there was no statistically significant difference in well-being behavior, life satisfaction, and subjective quality of life, indicating that the experimental group and the control group before the experiment were the same level. The findings of the study were as follows: The program was found to have effects on the wellbeing behaviors(z=-3.408, p=.001), life satisfaction(z=-3.225, p=.001) and subjective quality of life(z=-3.419, p=.001) of the experimental group. In contrast, there were no changes in the wellbeing behaviors(z=-.253, p=.800), life satisfaction(z=-1.418, p=.156) and subjective quality of life(z=-.000, p=1.000) of the control group. Therefore intensive efforts should be directed into the development and supply of various educational programs that could encourage elderly people to keep boosting their wellbeing behaviors, life satisfaction and subjective quality of life. In the future, this program will be indispensable to senior citizens who are increasingly larger in number due to the advancement of the times and the growing elderly population, and the program is expected to make a great contribution to fast- developing aging society.

[Keywords] ***Safety, A Wonderful Life Program, Wellbeing Behavior, Life Satisfaction, Subjective Quality of Life***

1. Introduction

In 2018, Korea that senior citizens aged 65 and up accounted for 14.3 percent of the entire population turned into aging society and is expected to become super-aging society in 2025 where senior citizens will represent 20.0 percent[1]. Such a rapid increase in the elderly population has emerged as one of social issues, and geriatric diseases that are caused by aging and concurrent with emotional disorders like loneliness, solitude and a sense of alienation may result in impairing their health and dropping their quality of life[1]. In relation to the rapidly growing elderly population, it's needed to pay more attention to the elderly because it's important to elevate their quality of life.

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A wonderful life program enables elderly people to change themselves for better to lead a healthy and happy life in old age, and an increase in the number of healthy and happy elderly people will make a contribution to social stability[2]. Therefore educational programs that deal with a new image of elderly people as leaders of local community, their volunteer work, self-management, relationship building, effective communication, problem solving, conflict management and successful aging should be provided for senior citizens to keep living a successful life in old age[3].

The application of the wonderful life program also makes it possible for elderly people to improve their leadership. Personally, that assists them in being accurately aware of their own disposition, in fostering skills necessary for maintaining interpersonal relationships and for better relationship building, and in attaining successful aging so that they could keep up with the times without difficulty[4].

It's required to encourage the wellbeing behaviors of senior citizens to raise their life satisfaction and subjective quality of life to change their lives for the better thanks to the social, physical and psychological changes[5].

Yang[4] argued that wellbeing behaviors make it possible to build a habit of seeking health promotion behaviors or health[6] and good life satisfaction could contribute to improving the quality of life in extended old age by affecting elderly people's attitudes toward their own past and present lives and by increasing their subjective satisfaction overall[7]. When individuals feel their subjective quality of life is good enough, it is followed by overall life satisfaction and positive subjective emotions and then gives more psychological, physical and environmental satisfaction to themselves[5].

Various studies attempted to verify the effects of the wonderful life program on successful aging[8][9][10], but there aren't sufficient studies to investigate the wellbeing behaviors, life satisfaction and subjective quality of life of the elderly.

This study made an attempt to examine the wellbeing behaviors, life satisfaction and subjective quality of life of community elderly people and to verify the effectiveness and usefulness of the wonderful life program so that community elderly people could lead a successful life in old age.

The Purpose and Hypotheses

The purpose of this study was to examine the effects of the wonderful life program on community elderly people.

Hypothesis 1. There would a difference in wellbeing behaviors between an experimental group to which the wonderful life program is provided and a control group to which the program isn't.

Hypothesis 2. There would a difference in life satisfaction between the experimental group to which the wonderful life program is provided and the control group to which the program isn't.

Hypothesis 3. There would a difference in the subjective quality of life between the experimental group to which the wonderful life program is provided and the control group to which the program isn't.

2. Experimental Methods

2.1. Research design

This study is a quasi-experimental research that adopted nonequivalent control group pretest-posttest design to determine the effects of the wonderful life program on wellbeing behaviors, life satisfaction and the subjective quality of life after offering it to the selected community elderly people.

2.2. The subjects

The elderly people who voluntarily asked for participating in this study were selected after this study was publicized through a social welfare center in a county, and the senior citizens who were at the ages of 65 and up and who satisfied the selection criteria of this study were selected from a social welfare center in an urban community as a control group to prevent any

possible similar research attempts. As for the determination of the sample size for data collection, G power 3.1.2. program was employed. 28 subjects who would be 14 experimental group members and 14 control group members were appropriate at .80 power(1-β), .50 effect size(f) and .05 level of significance(a), but 40 senior citizens who were 20 experimental group members and 20 control group members were selected in consideration of the possibility of dropout. Out of them, five members of the experimental group stopped participating on account of traveling during the program, and five members of the control group didn't take a posttest. So the final subjects in this study were 30 senior citizens who were 15 experimental group members and 15 control group members.

2.3. The wonderful life program

As shown in <Table 1> the wonderful life program is like a table.

Table 1. The wonderful life program.

	Objective	Activity
Orientation (session 1)	1. Understand the objectives and content of he program and promise to live a successful life in old age.	• Program orientation
Aging acceptance (session 2)	1. Positively accept biological, social and psychological changes to enjoy a mature life in old age. 2. Understand the objectives and content of the program and promise to live a successful life in old age.	• Know one's own changes in physical, psychological and mental functions.
Self-directed life (session 3)	1. Lead an active life with others, motivate oneself and seek after self-improvement and life of acting.	• Suggest how to lead an active life.
Well-dying (session 4)	1. Understand the value of death and the right attitude to it and lead a more positive, valuable and happier life. 2. Understand the objectives and content of the program and promise to live a successful life in old age.	• Understand what a good death is and make a plan to die a good death.
Hospice care (session 5)	1. Acquire how to take care of incurable terminal patients to help them die a comfortable and human life. 2. Understand the objectives and content of the program and promise to live a successful life in old age.	• Know the meaning of hospice care. • Activity
Prior self-determination for health care (session 6)	1. Be able to write an advanced healthcare directive on one's own. 2. Understand the objectives and content of the program and promise to live a successful life in old age.	• Know the meaning of a dignified death. • Understand organ donation and tissue donation. (Organ Sharing, Korean Organ Donor Program) • People whom I can help.
Appearance management (session 7)	1. Be aware of the positive and negative images of one's own body, reinforce one's strengths and learn how to stay beautiful and how to take care of the skin. 2. Understand the objectives and content of the program and promise to live a successful life in old age.	• Lecture on aging theories and explanation • Activity
Understanding senior welfare services (session 8)	1. Be aware of situation-specific welfare services available for different life cycles and be able to use them. 2. Understand the objectives and content of the program and promise to live a successful life in old age.	• Understand welfare for the elderly. • Understand long-term care insurance.
Understanding and practicing asset management (session 9)	1. Understand "how to manage income after retirement" and put it in practice. 2. Understand the objectives and content of the program and promise to live a successful life in old age.	• Manage assets wisely in old age. • Introduce products for asset management. • Spending management
Esteemed image (session 10)	1. Keep living a good life as one who is recognized as a precious and important person with decent confidence. 2. Understand the objectives and content of the program and promise to live a successful life in old age.	• Do what it takes to lead an esteemed life.

2.4. Instrumentation

1. Wellbeing Behaviors

The instrument used to measure wellbeing behaviors consists of wellbeing orientation, food characteristics, the characteristics of exercise and leisure, the characteristics of health considerations, clothing characteristics, housing characteristics and environmental characteristics. A higher score indicates better wellbeing behaviors[11]. The Cronbach alpha coefficient of it was .939 in this study.

2. Life Satisfaction

In the instrument used for life satisfaction measurement, a higher score indicates higher

life satisfaction[12]. The Cronbach alpha coefficient of it was .895 in this study.

3. The Subjective Quality of Life

The instrument used to assess the subjective quality of life makes cognitive and emotional evaluations of overall life. That is to measure one's feelings about his or her own recent experiences, and a higher score indicates more positive feelings toward life[13]. The Cronbach alpha coefficient of it was .897 in this study.

2.5. Data analysis

The collected data were analyzed by SPSS version 21.0 for Windows.

First, Shapiro-Wilk test was used to test the normality of the dependent variables.

Second, Chi-square test and Fisher's exact test were conducted to verify the prior homogeneity of the general characteristics and dependent variables of the experimental and control groups. When the requirements for normality weren't satisfied, Mann-Whitney U test was carried out, which is one of nonparametric tests.

Third, Mann-Whitney U test was used to test the hypotheses.

3. Results

3.1. General characteristics and homogeneity test

As shown in <Table 2>, the men and the women accounted for 40 and 60 percent respectively in the experimental group. In the control group, the men and the women represented 26.7 and 73.3 percent respectively. As for age, the respondents who were in their 60s accounted for 26.7 overall, and those who were in their 70s and up accounted for 73.3 percent overall. Concerning income, more than 63.3 percent earned an income of less than one million won in both groups. By academic credential, the middle-school graduates were largest in number in both groups, and the majority had spouses(93.3%). In addition, the majority had no occupations in both groups(90%). As a result of testing the homogeneity of the demographic characteristics between the experimental and control groups, there were no statistically significant differences, and the two groups were homogeneous.

Table 2. The general characteristics and homogeneity of the two groups.

Demographics		Exp. n(%)	Cont. n(%)	Total n(%)	χ^2	p
Gender	Male	6(40)	4(26.7)	10(33)	.600	.700
	Female	9(60)	11(73.3)	20(67)		
Age (yrs)	66-69	2(13.3)	6(40.0)	8(26.7)	2.941	.276
	70-75	10(66.7)	6(40.0)	16(53.3)		
	76-84	3(20.0)	3(20.0)	6(20.0)		
Economic status	Less than a million won	10(66.7)	9(60.0)	19(63.3)	.144	1.000
	A million won or more	5(33.3)	6(40.0)	11(36.7)		
Education	Elementary school	5(33.3)	3(20.0)	8(26.7)	1.381	.550
	Middle school	8(53.3)	11(73.3)	19(63.3)		
	High school	2(13.3)	1(6.7)	3(10.0)		
Spouse	Yes	13(86.7)	15(100)	28(93.3)	2.143	.483
	No	2(13.3)	0(0.00)	2(6.7)		
Job	Yes	2(13.3)	1(6.7)	3(10.0)	.370	1.000
	No	13(86.7)	14(93.3)	27(90.0)		

3.2. Homogeneity test on wellbeing behaviors, life satisfaction and subjective quality of life

As shown in <Table 3>, the prior homogeneity of wellbeing behaviors was tested, and there were no statistically significant differences(z=-1.743, p>.05). When the prior homogeneity of life satisfaction was tested, no significant differences were found, either(z=-1.821, p>.05). There were no statistically significant differences in the subjective quality of life, either(z=-.187, p>.05). The experimental group and the control group were at the same levels before the experiment was implemented.

Table 3. The homogeneity of wellbeing behaviors, life satisfaction and quality of life.

Variables	Exp. (N=15)	Cont. (N=15)	Total (N=30)	u	*z*	*p*
	M±SD	M±SD	M±SD			
Well-being behaviors	84.53±9.47	91.47±16.86	88.00±13.89	70.50	1.743	.081
Life satisfaction	16.60±1.35	18.33±2.87	17.47±2.37	69.50	1.821	.069
The quality of life	17.67±6.77	18.20±4.05	17.93±5.49	108.00	-.187	.870

3.3. The effects of the wonderful life program

As shown in <Table 4> about the effects of the wonderful life program on the subjects, the program turned out to have effects on the wellbeing behaviors(z=-3.408, p=.001), life satisfaction(z=-3.225, p=.001) and subjective quality of life(z=-3.419, p=.001) of the experimental group. On the contrary, there were no changes in the wellbeing behaviors(z=-.253, p=.800), life satisfaction(z=-1.418, p=.156) and subjective quality of life(z=-.000, p=1.000) of the control group.

Table 4. The comparison of wellbeing behaviors, life satisfaction and subjective quality of life between the pretest and posttest.

Variables	Groups	N	Pre-test	Post-test	z(*p*)
			M±SD	M±SD	
Wellbeing behaviors	Exp	15	84.53±9.47	108.60±9.10	-3.408 (.001**)
	Cont	15	91.47±16.86	90.53±14.99	-.253 (.800)
Life satisfaction	Exp	15	16.60±1.35	19.60±1.12	-3.225 (.001**)
	Cont	15	18.33±2.87	19.67±2.96	-1.418 (.156)
The quality of life	Exp	15	17.67±6.77	26.53±4.03	-3.419 (.001**)
	Cont*	15	18.20±4.05	18.20±4.05	-.000 (1.000)

Note: Exp: Experimental group, Cont: Control group. *p<.05, **p<.01, ***p<.001

4. Discussion

This study attempted to provide the selected senior citizens with the wonderful life program to research its influence on wellbeing behaviors, life satisfaction and the subjective quality of life to offer significant information on how to boost the life satisfaction and quality of life of the elderly.

The senior citizens to which the wonderful life program was applied showed statistically significant improvements in wellbeing behaviors, life satisfaction and the subjective quality of life.

In wellbeing behaviors, there were no differences between the experimental group and the control group before the program was provided, but it had an effect on the experimental group after that. It's difficult to make any direct comparative analysis because no studies have ever investigated wellbeing behaviors by offering a program that is similar to the program of this study, but studies that measured wellbeing behaviors using the same instrument as one used in this study produced significant results that are similar to the findings of this study[14]. Some studies found that there were significant differences in wellbeing behaviors among the elderly people[15][16], but whether the same program produces different results or not cannot be verified. Therefore sustained research efforts are required. As old age has gradually been extended along with the growing elderly population, it's needed to conduct the kind of education that applies the wonderful life program to draw more attention to health and encourage prolonged wellbeing behaviors that can guarantee quality life and happiness[17].

In life satisfaction, there were no differences between the experimental group and the control group before the program was offered, but the experimental group showed an increase after that. Erik and Koen's study[18] found that leisure programs make a far greater contribution to an increase in the life satisfaction of senior citizens. As this study also found that life satisfaction was on the rise after the wonderful life program was provided, this kind of program exercises a huge influence. Thus, the application of the program made a significant contribution to the increase in the life satisfaction of the senior citizens, and it's necessary to recommend the program to elevate the life satisfaction of the elderly. Since aging

phenomena are unavoidable irreversible changes, it's mandatory to provide the wonderful life program to change life for the better in spite of the inescapable changes caused by aging to ensure higher life satisfaction.

In the quality of life, there were no differences between the experimental group and the control group before the program was conducted, but the experimental group showed an improvement after that. Studies that provided social and leisure activity programs to raise the quality of life of rural elderly people found that the programs were effective at boosting the subjective quality of life of the rural female senior citizens[19][20], and their findings are similar to the findings of this study. All the findings justified the importance of the wonderful life program as a way to raise the quality of life of rural senior citizens. Elderly people are likely to have more educational needs for the program when their subjective quality of life becomes higher. Therefore it's required to promote the program to community elderly people who intend to participate in the program, and intensive efforts should be made to publicize and provide the program. In the future, this program will be indispensable to senior citizens who are increasingly larger in number due to the advancement of the times and the growing elderly population, and the program is expected to make a great contribution to fast- developing aging society.

5. Summary and Conclusion

The findings of the study that applied the wonderful lie program for the community elderly people illustrated that better awareness of well-being behaviors led to better wellbeing behaviors. Therefore full- fledged efforts should be channeled into the development and supply of various educational programs that can further the sustained wellbeing behaviors of the elderly. Since this study produced significant results in regard to the wellbeing behaviors, life satisfaction and subjective quality of life of the senior citizens, prolonged research is required, which seems to be mandatory in preparation for future aged society and needs continuing careful observation.

Given the findings of the study, there are some suggestions: First, a wider variety of variables should be investigated in the future to test the effects of the wonderful life program. Second, the program should be provided for subjects from more various regions.

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Lead Author
Byeon Mi-kyeong / Songho University Assistant Professor
B.A. Korea National Open University
M.A. Gangneung Wonju National University
Ph.D. Kangwon National University

Research field
- Effects of Well-dying Program for Meaning of Life, Self-efficiency, and Successive Aging in the Elderly, Journal of the Korea Academia Industrial Cooperation Society, 18(10) (2017).
- Effects of Dementia Prevention Program on Cognitive Function, Depression and Quality of Life in Elderly Women, The Asian International Journal of Life Sciences, 15(1) (2018).

Major career
- 2011~2013. Bsneedyou Nursing Home, Director
- 2014~present. Songho University, Assistant Professor

Corresponding Author
Park Sun-jung / Yeoju Institute of Technology Assistant Professor
B.A. Yonsei University Wonju College of Medicine
M.A. Hallym University
Ph.D. Samgyuk University

Research field
- Development of Clinical Communication Tools Related to the Death Preparation, Journal of Medical Imaging and Health Informatics, 8 (2018).
- Relationships of Death Awareness, Spiritual Well-being and Geriatric Nursing Performance in College Nursing Students, The Asian International Journal of Life Sciences, 15(1) (2018).

Major career
- 2012~2014. Gangneung Youngdong University, Lecturer
- 2015~present. Yeoju Institute of Technology, Assistant Professor

Co-Author
Choi Eun-young / Kyungdong University Associate Professor
B.A. Korea National Open University
M.A. Gangneung Wonju National University
Ph.D. Kangwon National University

Research field
- Analysis of Nursing Students' Educational Needs for Knowledge, Attitude and Practice of Gerontological Nursing in Korea, The Asian International Journal of Life Sciences, 27(2) (2018).
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Major career
- 2012~2014. Gangneung Youngdong University, Lecturer
- 2015.9~present. Kyungdong University, Associate Professor

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Corresponding author
E-mail: kbchoi@cnc.ac.kr

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A Study on Stress, Self-Esteem and Resilience for KOREAN Nursing Students' SAFETY Management

Choi Keum-bong*

Chosun Nursing College, Gwangju, Republic of Korea

Abstract

Purpose; The purpose of this study is to identify the levels of stress, self-esteem and resilience of nursing college students' safety management and to recognize the correlations between them. Methods; The research design is a descriptive correlational study design and used convenience sampling on 203 senior nursing students in G city. The used research measures were tools which measure stress, self-esteem and resilience. Data collection was conducted from June 2, 2017 to June 15, 2017 using SPSS 21.0 for data analysis. Results; The results show that stress is affected by health status, major satisfaction and clinical practice satisfaction. Meanwhile, resilience is affected by health status, selective motivation for nursing major, interpersonal relationships, personality trait and major satisfaction. Stress and resilience are negatively correlated while self-esteem and resilience are positively correlated. In other words, an increase in stress levels correlates with a decrease in resilience and conversely, a decrease in stress levels correlates with an increase in resilience. An increase in self-esteem correlates with an increase in resilience and a decrease in self-esteem correlates with a decrease in resilience. Conclusion; Therefore, there is a need for institutions that are responsible for the education and management of nursing colleges to preferentially take interest in helping nursing students with their stress and college adjustment. In addition, if the social support system that protects nursing students is systemically formed and utilized, it can not only help increase self-esteem and resilience of nursing students but also improve their quality of life, contributing to higher level of nursing profession settings.

[Keywords] ***Safety Management, Stress, Self-Esteem, Resilience, Nursing Students***

1. Introduction

Nursing students are not only stressed from the environmental change of university but also from clinical practice performance compared to other college students. Korean college students experience various stress in this rapidly changing and unstable modern society. In particular, nursing students experience stress from the strict curriculum and clinical practice along with the pressure of passing the national nursing exam and seeking employment[1]. Therefore, it is necessary to make appropriate use of stress coping strategies to adapt a more efficient and positive direction in these situations. Thus, there is a need for society to pay close attention to this phenomenon because college students occupy an important portion of society.

Stress is an 'individual's physical and mental behavioral responses to a stressor' which can also act as causal factors of psychological illness[2]. When stress is magnified by factors such as academic, interpersonal, and emotional relationships, it can result in physical

*Funding Agency: This work was supported by Chosun Nursing College Research Fund in 2015.

and physiological symptoms along with dissatisfaction and maladjustment in college life[3]. In more serious cases, some college students can become vulnerable, exacerbating their existing disorders and affecting social reintegration. The top stressor for college students was academic studies and the top reason for suicide was stress from academic and career problems[4]. In particular, nursing students are not only stressed by general university life but also clinical practice performance which occupies a significant portion of their grades. Compared to other students, nursing students bear the burden of balancing both heavy academic studies and clinical practice which does not allow trial and error as clinical practice deals with real patient[5]. Therefore, it is important to seek for a solution and look into industrial-educational cooperation to cope with nursing students' stress in this modern rapidly changing health care reality.

Nursing students who engage in clinical practice experience more stress compared to other students because they not only have to go through rigorous academics but also as half a member of society must acquire a specific set of information from clinical practice in a short period of time[6]. If these stresses are not adequately addressed, they will not only negatively affect physical health but may also bring out depression, anxiety, reduced confidence, academic degradation, and school maladjustment[7]. Despite knowing that clinical practice is essential, nursing students are afraid of losing confidence. In more serious cases, some students may even feel conflicted about their major so there is a great need for a management system to support these particular individuals.

There have been many studies on control variables that are thought to either buffer the effects of stress or help students adapt to stress. These studies found out that self- esteem and self-efficacy were the control variable[8]. Self-esteem is an important factor in college life and adjustment. Nursing students with high self-esteem are found to be satisfied with their major and as a result of low stress levels and response factors from clinical practice, they act confidently and communicate with patients smoothly and energetically[9]. Seo reported that self-esteem was the most influential factor in the clinical performance of nursing college students[10]. The higher the self-esteem was the lower the stress of clinical practice and the higher the major satisfaction. Thus, those with high self-esteem have a greater tendency to try out new behaviors and possess high self-efficacy and academic achievement[11]. Therefore, nursing students need a guideline or interest to help develop their ability to reinforce positive self-awareness.

Resilience is a concept derived from the point of view that it can buffer or help the adaptation of extreme stress. While there are precedent studies which focus on nursing students' stress from clinical practice and from academic and career problems, there is a lack of study on stress that stems from general university life and clinical practice performance[12]. In addition, self-efficacy and resilience have been studied as individual factors that predict college life adaptation, but there has been little study that testifies the possibility of self-esteem as an intermediator between academic stress and college adjustment[13]. Most of the precedent studies aimed its focus on clinical practice, conducting surveys on only self-esteem and practice satisfaction, which indicates a lack of study on self-esteem and resilience[14]. Therefore, this study identifies the stress nursing students experience from college life and distinguishes the differences between self-esteem and resilience. By identifying the relationship between self-esteem and resilience, this study attempts to provide basic data which is necessary for developing a strategy that will help students to adjust college better and decrease their stress.

1.1. Purpose

The purpose of this study is to identify the stress, self-esteem, and resilience of nursing students and to grasp the correlation between them. The specific purpose is as follows:

1)To identify the general characteristics of nursing students.

2)To identify the differences among stress, self-esteem and resilience according to the general characteristics of nursing students.

3)To identify the correlations between stress, self-esteem and resilience of nursing students.

2. Method

2.1. Study design

This study is a descriptive correlational study design that identifies the differences and correlations between stress, self-esteem and resilience of nursing students.

2.2. Study participants

This study's participants were senior students who are currently enrolled in a four year nursing college in G city and have had more than 8 weeks of experience in clinical practice. The participants were nursing students who understood the purpose of this study and gave written consent of their participation through questionnaires. The appropriate number of participants for this study was calculated, based on significance level (a) .05, effect size .30, power .95 when using G* power 3.1 program[15]. The minimum number of samples was 115, but the final number of participants was 203 through convenience sampling of 211 nursing students available for questionnaire survey.

2.3. Study measurements

2.3.1. Stress

In order to measure the stress of nursing students, the study used a tool of Yoo et al[16] which was developed to measure the stress of nursing students in South Korea. This tool consists a total of 59 items with 29 general college life stress items(15 intrapersonal, 5 interpersonal, 10 academics, 9 environmental) and 20 clinical practice stress items(8 clinical practice participants, 4 clinical practice environment, 5 clinical practice instructor, 3 clinical practice students) and uses a Likert 5 point scale. Each item is scored from 0, "I don't experience any stress at all", to 4, "Experience is very strong", with 4 as the highest score and 0 as the lowest. Thus, a higher score indicates a higher level of stress. The tool's reliability at the time of development was Cronbach's α=.92 and in this particular study is Cronbach's α=.95.

2.3.2. Self-esteem

In this study, Lee[17] 7 used 20 items of Harter's Self-Perception Profile for Children[18] which is a tool used to measure self-esteem. SPCC includes 6 sub-scales of academic ability, social ability, exercise ability, behavior belief, general appearance, and general self value. The response range was from 1, "It's not like that at all", to 5, "so much", with the score 5 indicating a high self-esteem. The tool's reliability is Cronbach's α =.79.

2.3.3. Resilience

Song[19] conducted a translation and reverse translation process of the Resilience Scale(RS) developed by Wagnild and Young[20] in order to measure reliability,. This tool was then successfully verified by an expert group's counsel. The tool consists a total of 25 items with 17 items on personal capacity and 8 on acceptance of one's life. The response range was from 1, "disagree", to 7, "agree" on a Likert 7-point scale with 25 as the minimum score and 175 the maximum score. Thus, a higher score indicates a higher capacity of resilience. The tool's reliability at the time of development was Cronbach's α=.85 and in Song's[19] study was Cronbach's α=.88. In this study, the reliability is Cronbach's α=.89.

2.4. Data collection

Data collection took place from June 2 to June 15, 2017 and focused on senior students who were attending school at the nursing college in G city. Before data collection, a self-reporting type questionnaire was used to explain questionnaire contents and writing methods and to receive students' consent to participate in this study. The questionnaire took about 10~15 minutes.

2.5. Ethical considerations

The participants were informed of the study's necessity, purpose and method beforehand in order to protect their rights. Also, they were told that the data will be only used for study purposes and treated namelessly. In addition, they were informed that the study's participation was decided by voluntary intention and that it was possible to withdraw anytime during the study. The research was conducted only after participants voluntarily gave their written consent. Collected questionnaires and other related data will be disposed after the study is over.

2.6. Data analysis

The collected data were analyzed using SPSS/PC 21, and the detailed analysis method is as follows.

1)The general characteristics of the participants were analyzed utilizing frequency and descriptive statistics.

2)The reliability of the measuring instrument was analyzed using Cronbach's α.

3)The differences between stress, self-esteem and resilience according to the participants' general characteristics were analyzed by t-test, one-way ANOVA.

4)The correlations between stress, self-esteem and resilience of the participants were analyzed by Pearson's correlation coefficient.

3. Results

3.1. General characteristics of the participants

89.7% of the participants were female and 10.3% were male with a majority of female participants. In terms of health status, 45.4% of the participants were healthy and 38.4% were average indicating that most possessed an above average health status. 81.3% of the participants attained a middle level scholastic achievement. 40.9% of the participants stated that their selective motivation for the nursing major was because it employed well while 27.1% reported that they were recommended by parents or teachers and 25.6% claimed that the nursing major seemed compatible with their grades and aptitude. In terms of interpersonal characteristics, 50.2% of the participants were average. 47.7% of the participants reported that their personality trait was in the middle level. 51.2% of the participants were satisfied with their major while 32.0% were averagely satisfied. In terms of clinical practice satisfaction, 45.3% of the participants were averagely satisfied. The general characteristics of the participants are as follows <Table 1>.

3.2. Differences between stress, self-esteem and resilience according to the participants' general characteristics

Stress according to the participants' general characteristics of health status(F=5.271, p=.001), major satisfaction(F=2.561, p=.032) and clinical practice satisfaction(F=4.203, p=.000) presented statistically significant differences. Meanwhile, stress according to general characteristics of gender, religion, scholastic achievement, selective motivation for nursing major, interpersonal relationships, interpersonal characteristics and clinical practical leaders presented no statistically significant differences. Self-esteem according to all of the general characteristics presented no statistically significant differences as well. Resilience according to the participants' general characteristics of health status(F=5.709, p=.001), selective motivation for nursing major(F=2.441, p=.030), interpersonal relationships (F=6.023, p=.001), personality trait(F=9.412, p=.000) and major satisfaction(F=9.405, p=.002) presented statistically significant differences. Meanwhile, resilience according to gender, religion, scholastic achievement, clinical practice satisfaction and clinical practical leaders presented no statistically significant differences. The differences in stress, self-esteem and resilience according to the participants' general characteristics are as follows <Table 2>.

Table 1. General characteristics of the participants(n=203).

Characteristics	Categories	n	%
Gender	Male	21	10.3
	Female	182	89.7
Health status	Poor	10	4.9
	Neutral	78	38.4
	Healthy	92	45.4
	Very healthy	23	11.3
Scholastic achievement	Low	12	5.9
	Middle	165	81.3
	High	26	12.8
Selective motivation for nursing major	High school grade	13	6.4
	Aptitude	52	25.6
	Employment	83	40.9
	Recommendations	55	27.1
Interpersonal relationship	Poor	2	1.0
	Neutral	102	50.2
	Good	99	48.8
Personality trait	Introverted	47	23.2
	Middle	97	47.7
	Extroverted	59	29.1
Major satisfaction	Very unsatisfied	1	.5
	Unsatisfied	14	6.9
	Neutral	65	32.0
	Satisfied	104	51.2
	Very satisfied	19	9.4
Clinical practice satisfaction	Very unsatisfied	8	3.9
	Unsatisfied	26	12.8
	Neutral	92	45.3
	Satisfied	71	35.0
	Very satisfied	6	3.0

Table 2. Differences between stress, self-esteem and resilience according to general characteristics of participants(n=203).

Variable	Categories	Stress		Self-esteem		Resilience	
		Mean ± SD	t/F *(p)*	Mean ± SD	t/F*(p)*	Mean ± SD	t/F*(p)*
Gender	Male	2.85±1.02 -	.043	3.84±0.24	.059	5.05±0.57	.796
	Female	2.91±0.62	(.943)	3.83±0.26	(.920)	4.86±0.48	(.289)
Health status	Poor	3.23±0.62		3.81±0.52		4.25±0.27	
	Neutral	2.95±0.42	5.271	3.89±0.25	1.035	4.28±0.58	5.709
	Healthy	2.68±0.92	(.001)	3.82±0.34	(.269)	5.02±0.65	(.001)
	Very healthy	2.72±0.62		3.68±0.27		5.25±0.44	
Scholastic achievement	Low	2.91±0.83	.702	3.62±0.30	1.782	4.81±0.78	.212
	Middle	2.39±0.39	(.481)	3.82±0.36	(.125)	4.75±0.53	(.725)
	High	3.02±0.54		3.80±0.03		5.02±0.69	
Selective motivation for nursing major	High school grade	2.57±0.35		3.90±0.44		4.82±0.72	
	Aptitude	2.58±0.69	1.663	3.82±0.35	1.892	5.23±0.59	2.441
	Employment	3.00±0.89	(.187)	3.62±0.34	(.102)	4.89±0.68	(.030)
	Recommendations	2.82±0.69		3.26±0.31		4.67±0.59	
Interper-sonal relationship	Poor	3.08±0.02	2.025	3.82±0.01	1.881	4.28±0.01	6.023
	Neutral	2.99±0.85	(.089)	3.79±0.33	(.115)	4.78±0.58	(.001)
	Good	2.79±0.65		3.50±0.25		5.23±0.59	
Personality trait	Introverted	3.03±0.02	2.325	3.84±0.00	1.264	4.27±0.01	9.412
	Middle	2.86±0.61	(.042)	3.78±0.26	(.291)	4.87±0.59	(.000)
	Extroverted	2.69±0.84		3.626±0.33		5.26±0.59	
Major satisfaction	Very unsatisfied	3.01±0.02		3.69±0.15		4.21±0.25	
	Unsatisfied	3.06±0.61	2.561	3.71±0.39	1.035	4.25±0.55	9.405
	Neutral	3.09±0.51	(.032)	3.77±0.37	(.265)	4.79±0.52	(.002)
	Satisfied	2.89±0.61		3.89±0.35		5.08±0.63	
	Very satisfied	2.64±0.84		3.57±0.33		5.26±0.78	
Clinical practice satisfaction	Very unsatisfied	3.34±0.62		3.88±0.30		4.80±0.62	
	Unsatisfied	3.01±0.60	4.203	3.79±0.49	.438	4.79±0.85	2.419
	Neutral	2.98±0.62	(.000)	3.79±0.38	(.802)	4.82±0.70	(.048)
	Satisfied	2.73±0.65		3.82±0.36		5.46±0.62	
	Very satisfied	2.41±0.97		3.71±0.31		5.69±0.71	

3.3. Correlations between stress, self-esteem and resilience

The relationship between stress and resilience was a negative correlation(r=-.258, p=000). In other words, as stress increases, resilience decreases and as stress decreases, resilience increases. Meanwhile, self-esteem and resilience was found to be a positive correlation(r=.162, p=.019). Thus, as self-esteem increases, resilience increases and as self-esteem decreases, resilience decreases. The correlations between stress, self-esteem and resilience of the participants are as follows <Table 3>.

Table 3. Correlations between stress, self-esteem and resilience(n=203).

Variables	Stress	Self -esteem	Resilience
Stress	1	.103(.126)	-.257(.000)
Self -esteem	.103(.129)	1	.164(.021)
Resilience	-.258(.000)	.162(.019)	1

4. Discussion

The purpose of this study was to identify the levels of and relations between stress, self-esteem and resilience of nursing college students. Also, the study attempted to provide basic data that will help others seek a direction in decreasing the stress levels of nursing students and helping them adapt to college life. The study's results found that there were significant differences in stress according to health status, major satisfaction and clinical practice satisfaction. Also, there were significant differences in resilience according to health status, selective motivation for nursing major, interpersonal relationship, personality trait and major satisfaction. The significant correlation between stress and resilience was found to be a negative correlation and a positive correlation for self-esteem and resilience. In other words, as stress increases, resilience decreases and conversely, as stress decreases, resilience increases. For self-esteem and resilience, an increase in self-esteem resulted in an increase in resilience and conversely, a decrease in self-esteem resulted in a decrease in resilience.

There was a statistically significant difference in stress according to the participants' general characteristics of health status, major satisfaction and clinical practice. In terms of gender, the stress for male college nursing students was 2.85 and 2.91 for female nursing students indicating that stress was not different according to gender. In terms of health status, a poor health status scored a lower score in stress while a good health status scored a higher score indicating a sequential relationship. Park reported similarly in his study that a college student's stress affected health status[21]. Therefore, there is a need to systemically utilize health programs in order to reduce the stress of nursing students.

Students in the high scholastic achievement group showed the highest tendency for stress while students in the middle group presented the lowest level of stress indicating an inconsistent tendency among different scholastic achievements. Thus, the differences were not statistically significant to make generalizations. In terms of selective motivation for nursing major, students who chose nursing due to its high employment experienced the highest level of stress, but the results were not statistically significant. Students with a higher level of interpersonal relationship had a tendency to experience less stress. Also, students who were more satisfied with their major demonstrated a lower tendency for stress. Therefore, these results suggest that increasing major satisfaction and maintaining an active attitude of life can decrease the stress of students. Thus, there is a need in the educational back-

ground to put effort in continuously inculcating confidence and positive thought in students.

In this study, stress related to clinical practice especially decreased as clinical practice satisfaction increased. Stress was 3.01 for the unsatisfied group, while the average decreased to 2.98 for the satisfied group. In other words, students who were more satisfied with clinical practice experienced a lower level of stress.

Shin and Hwang reported a statistically significant increase in the level of stress according to a higher level of dissatisfaction with clinical practice which is similar to the results of this study[22][23]. Yang and Moon reported a statistically significant correlation between clinical practice stress and clinical practice satisfaction in nursing college students[24]. The results of this study suggest that a sufficient consultation between the practical institution and the school should be required focusing on how an increase in clinical practice satisfaction can help reduce clinical practice stress. Also, there is a need to explore a variety of directions such as preclinical practice mentoring in order to help students cope with clinical practice stress. problems.

The descriptive statistics score for self-esteem according to the general characteristics of the study's participants demonstrated differences between the groups but not all of the other characteristics showed statistically significant differences. The descriptive statistics of self-esteem according to general characteristics showed that there was a difference between scholastic achievement groups. Self-esteem tended to increase more and more according to scholastic achievement. Lee reported in a study similar to this study that self-esteem has a direct effect on learning immersion and an indirect effect on academic achievement[11]. In particular, the case of selective motivation for nursing major demonstrated that students who enrolled due to consideration of their high school grades had the highest self-esteem score of 3.90 while students who enrolled due to a recommendation from parents or teachers had the lowest score of 3.26. Most of the students who enrolled in nursing school due to subjectivity and aptitude showed a more positive difference but the difference is not statistically significant. In addition, there is a slight increase of self-esteem from unsatisfactory major satisfaction to satisfactory major satisfaction but it is not statistically significant. However, the study was able to grasp that a higher major satisfaction leads to a positive direction in self-esteem. Thus, efforts to increase major satisfaction is now identified as a preferentially essential tool.

Resilience according to the general characteristics of the study's participants showed statistically significant differences in health status, selective motivation for nursing major, interpersonal relationships, personality trait and major satisfaction. According to health status, the unhealthy group scored 4.25 points while the healthy group sequentially scored higher with 5.02 points. A poor health status scored a low resilience score while the resilience score increased sequentially for the healthy status group. Therefore, it can be confirmed that health status is an important variable in increasing resilience and that it is necessary to plan and manage an appropriate health program for these students. According to selective motivations for nursing major, students who chose nursing due to its compatibility with their personalities and interests had the highest score of 5.23 while students who chose nursing due to recommendations from parents and teachers scored the lowest of 4.67 points indicating that self motivation led to a higher resilience score. Therefore, it is necessary to provide opportunities for students with low resilience scores in order to lead them to a more positive direction.

Resilience also demonstrated differences according to interpersonal relationships. The average interpersonal relationships group scored 4.78 points while the good interpersonal relationships group scored 5.23 points.

Thus, students with better interpersonal relationships tended to score higher in resilience. Kang and Lee also similarly found that students who maintain wide interpersonal relationships are social, passionate and active in any given situations which demonstrates high resilience[25]. Thus, the considerable influence of interpersonal relationships on students' resilience raises the need for an appropriate mediation. Resilience according to personality trait showed differences as well with the introverted group scoring 4.27 points and the extroverted group 5.26 points. In other words, students who are more extroverted tended to score higher in resilience. These results are similar to the study of Kang and Lee which found that extroverted students had higher resilience and experienced better school adjustment than introverted students[25]. Therefore, freshmen students should take personality type tests in the beginning of the term so schools can use those results to host appropriate programs that can help out introverted students or those with narrow interpersonal relationships. Resilience according to major satisfaction also showed that students with a higher major satisfaction tended to be more positively resilient. Thus, there is a need to consistently inculcate self-esteem and positive thought in nursing students.

In this study, stress and resilience according to major satisfaction each showed statistically significant differences between groups which satisfy the minimum significant level. It can be observed that stress and resilience of nursing students improve to a significant degree when major satisfaction increases. The analysis of the correlation between stress, self-esteem and resilience reveals that an increase in stress levels correlates with a decrease in resilience. Conversely, a decrease in stress levels correlates with an increase in resilience. These results are consistent with the study of Kang and Lee, which similarly found a negative correlation between stress and resilience, and that of Park & Kim, which found that stress decreases as resilience increases[25][5]. An important attribute of resilience is the process when one returns to everyday life after a difficult situation, so there is a great need to manage various resilience improvement programs in order to help alleviate the stress of nursing students.

The correlation between stress and self-esteem did not satisfy a statistically significant level. However, the studies of Yim found that high self-esteem correlates with low levels of stress and that low self-esteem correlates with high levels of stress, pointing out to an inverse correlation between self-esteem and stress[18]. This inconsistency may be due to the differences in the generalization and standardization of the self-esteem measuring tool so there is a need for a following study. In addition, this study found that resilience of nursing students increases as self-esteem increases and vice versa. As there are no previous studies concerning this topic, there is a need for follow- up studies and various programs that help nursing students with self-esteem.

The significance of this study is that first, it examines the experiences nursing students, who engage in clinical practice, face in this rapidly changing society and healthcare circumstances. Also, the study evaluates the stress students experience from college life or clinical practice and provides an analysis of its relationship with variables such as self-esteem and resilience. Secondly, it provides basic data for nursing schools on how to efficiently lead and manage students. Third, this study is of significance in the aspects of theory, research, education, and nursing practice in that it provides industrial institutions in charge of clinical practice for nursing students with basic data on how to efficiently manage nursing students who are a part of nursing staff. Therefore, based on the basic data collected in this study, there is a need for interest and effort in trying to improve the quality of life of nursing students who will play an important role in the nursing profession.

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Author
Choi Keum-bong / Chosun Nursing College Associate Professor
B.A. Chosun University
M.A. Chosun University
Ph.D. Chosun University

Research field
- Effects of the Reeducation of Core Fundamental Nursing Skills on Clinical Stress, Critical Thinking Disposition and Self-confidence in Nursing Skills of Senior Nursing Students, The Journal of Korean Academic Society of Nursing Education, 22(3) (2016).
- The Effect of Breathing Meditation on High School Student's Stress, Anxiety, and Self-efficacy, Korean Association for Learner-Centered Curriculum and Instruction, 18(6) (2018).

Major career
- 2006~2011. Chosun University, Lecturer & Researcher
- 2011~present. Chosun Nursing College, Associate Professor

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Impact of Oral Care Protocol on the Oral SAFETY & Nutritional Status of Lung-Cancer Patients under Anticancer Chemotherapy

Kim Won-jeong[1]

Ewha Womans University, Seoul, Republic of Korea

Kang Ji-sook[2*]

Wonkwang University, Jeonbuk, Republic of Korea

Abstract

Purpose: This Research intends to apply oral care protocol including preventative nursing intervention for lung cancer patients under anticancer chemotherapy to find its effects on oral safety and nutrition status. Methods: This Research employs one-group pre-post design intended to find out the impacts of oral care protocol on the oral safety and nutrition status of lung cancer patients under anticancer chemotherapy. Pre-investigation was conducted on the subjects twice at 4-week interval, and post-investigation was conducted once 4 weeks after the oral care protocol was applied. The Oral Assessment Guide(OAG) was used to determine objective aspects of oral safety. The Patient Generated Subjective Global Assessment(PGSGA), aspects of nutrition status. For collected data, frequency, percentage, average, standard deviation and Repeated Measures ANOVA were conducted using SPSS 20.0. Results: The major findings of this study were as follows. 1)The OAG score of participants to which an oral care protocol was applied(F=4.085, p=.022) showed significant difference by measurement times. 2)The Nutrition status of participants to which an oral care protocol was applied showed a relation by measurement times. For PGSGA score(F=7.498, p=.003), there were significant difference by measurement times. Conclusion: The finding of this study gives a useful information for the strategies of improving oral safety and nutrition as performing oral care protocol

[Keywords] ***Safety, Oral, Stomatitis, Nutrition, Cancer***

1. Introduction

1.1. Background

Lung cancer is not only the most prone malignant tumors around the world but also the cancer type accounting for the biggest share of deaths from cancers[1]. The crude incidence rate of lung cancer is 41.5 per 100,000 persons in Korea, with approximately 20,000 persons diagnosed with lung cancer each year[2]. The mortality rate of lung cancer is 31.7 per 100,000 persons, accounting for the biggest share of deaths from cancers. The five-year survival rate of lung cancer is 19.0%, which is the second-lowest only after that of pancreatic cancer[3]. The annual treatment cost of lung cancer is 289 billion won per year as of 2011 in Korea, which is ranked No. 2 among cancer types in terms of hospital bills and keeps rising year by year[4]. The lung cancer is relatively difficult to diagnose in early stage, and it is typically quite developed when diagnosed, making less than 25% of lung-cancer patients fit for surgery then[5][6]. Therefore, the gravity of anticancer chemotherapy and radiotherapy, etc. is very significant for lung cancer when compared with other cancer types, which makes long-term treatment and care all the more important. Advances of such chemotherapy and radiotherapy continue to extend survival duration, and symptom experiences and side effects accompanying them have significant impact on the quality of life of patients. In particular,

anticancer chemotherapy is a critical cure for cancer, but, its side effects can be so serious as to halt treatment. Therefore, the control of such side effects is a critical part of care for cancer patients[7].

Stomatitis is the most common and severe complication of anticancer chemotherapy for cancer patients, with its symptom ranging from minor change such as burning sensation inside mouth to change in salivation, mucosal ulceration, bleeding, and infection, etc. Patients can suffer even severe pain, and such functional disorders as dysphagia, difficulty with dietary intake, etc. Stomatitis can also be a route of infection and a cause of nutrition disorder, impacting treatment by affecting administration of anticancer drugs in terms of timing and dose and thereby delaying cancer treatment[8]. When treatment is extended as such, the quality of life or functional conditions of affected patient is affected, resulting in longer hospitalization period and more treatment cost[9]. If severe, stomatitis in cancer patient can result in death, which calls for a prevention strategy that can mitigate the occurrence and severity of stomatitis[10]. Factors affecting the occurrence and severity of stomatitis range from type and dose of anticancer drug to personal traits of patient, type of cancer, neutrophil count, nutrition status, renal and hepatic functions, pre-chemotherapy oral status, and oral care during chemotherapy, etc[11]. Among them, oral care provided prior to the start of anticancer chemotherapy is the most important element in preventing stomatitis and mitigating its occurrence[12]. However, preventative care is not properly provided in current actual clinical practices even if the occurrence of stomatitis is anticipated, and treatment begins in most cases only after stomatitis occurs.

Stomatitis is the representative physical discomfort entailing anticancer chemotherapy, reducing nutrition intake with nausea, vomiting, and loss of appetite. Most preceding studies in the field of nursing focus on occurrence of stomatitis entailing anticancer chemotherapy and nursing intervention protocol after its occurrence, with less than enough interest in studying stomatitis together with nutrition problem or preventative care of stomatitis.

Accordingly, this Research attempts to provide basic inputs for development of nursing intervention for cancer patients by applying oral care protocol including preventative nursing intervention for lung cancer patients under anticancer chemotherapy and studying its effects for oral safety and nutrition status represented by stomatitis.

1.2. Purpose

This Research intends to apply oral care protocol including preventative nursing intervention for lung cancer patients under anticancer chemotherapy to find its effects on oral safety and nutrition status, with the following specific objectives:

Firstly, identify the effects of oral care protocol on the oral safety of lung cancer patients under anticancer chemotherapy.

Secondly, identify the effects of oral care protocol on the nutrition status of lung cancer patients under anticancer chemotherapy.

1.3. Research hypotheses

1.3.1. Hypothesis 1

OAG(Oral Assessment Guide) scores of lung cancer patients receiving anticancer chemotherapy and under oral care protocol must vary, depending on timing.

1.3.2. Hypothesis 2

PGSGA(Patient Generated Subjective Global Assessment) scores of lung cancer patients receiving anticancer chemotherapy and under oral care protocol must vary, depending on timing.

1.4. Definitions

1.4.1. Oral care protocol

Oral care protocol is a standard specifically describing oral care practices to be performed to prevent or mitigate stomatitis of patients under anticancer chemotherapy based on clinical judgment and knowledge. In

this Research, it refers to an oral care program including oral care education materials developed independently in reference to research literature and verified by experts for feasibility. Depending on OAG scores, teeth are brushed 4 times and gargling with Baking Soda solution performed 4 times at or under 8 points whereas teeth are brushed 4 times and gargling with 0.15% Tantum solution performed 4 times at or over 9 points.

1.4.2. Oral safety

Oral safety is measured by OAG score. Stomatitis means inflammation or ulceration in oral mucosa, and the Oral Assessment Guide(OAG) score developed by Eilers et al(1988)[13] is used in this Research. The higher the OAG score is, the more severe stomatitis is.

1.4.3. Nutrition status

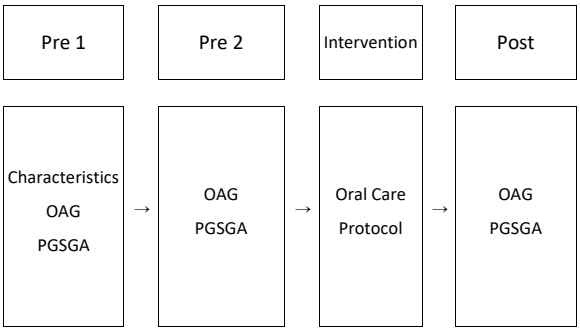
Nutrition status is assessed to verify whether in vivo metabolic responses occur normally, relying on supply of calorie and nutrients essential for sustaining our body (Bauer et al, 2002)[14]. The nutrition status in this Research is determined based on the Patient Generated Subjective Global Assessment(PGSGA) score developed by Bauer et al(2002)[14] and reported as an appropriate tool for nutrition assessment of cancer patients, weight of cancer patient under anticancer chemotherapy, hemoglobin count confirmed by medical records, serum total protein, and serum albumin.

2. Methods

2.1. Research design

This Research employs a single group non-synchronized design intended to find out the impacts of oral care protocol on the oral safety and nutrition status of lung cancer patients under anticancer chemotherapy. Pre-investigation was conducted on the subjects twice at 4-week interval, and post-investigation was conducted once 4 weeks after the oral care protocol was applied <Figure 1>.

Figure 1. Research Design.



2.2. Research subjects

Minimum 24 subjects were estimated as the number of samples for this Study, using G-Power 3.1 to maintain statistical power of 0.80 at medium effect size and significance level 0.05. Accordingly, the objectives of this Research were explained along with anonymity, confidentiality and opt-out arrangements to adult lung cancer patients receiving anticancer chemotherapy in the hospital of the Medical School of Wonkwang University, and informed consent forms were presented following confirmation of checkup results from medical records, and 34 patients who agreed to join this Research were selected as subjects in consideration of possible dropout rate. 5 subjects whose anticancer chemotherapy was rescheduled or to whom the oral care protocol was not applicable were excluded and 29 patients in total remained as the subjects of this Research till the end.

Specific subject selection and exclusion criteria are as follows:

2.2.1. Subject selection criteria

- Adults aged 20 years in full and capable of performing self-care

- Persons receiving anticancer chemotherapy

- Persons who can take food orally

- Persons who understand the objectives of the Research and consent in writing to participate in it

2.2.2. Subject exclusion criteria

- Persons who are suspended from being treated with medication or prevented from participating in the Research on the account

of complication occurring or health status worsening during the Research

- Persons who suffer from other chronic ailments(chronic renal failure, heart failure, etc.)

- Persons who suffer from severe edema

- Persons who have difficulties with taking food due to gastrointestinal obstruction, confusional state of consciousness, etc.

- Persons who consented to the Research initially but dropped out prematurely

2.3. Instruments

2.3.1. Oral care protocol

Depending on OAG scores, the oral care protocol requires teeth to be brushed 4 times and gargled with Baking Soda solution performed 4 times at or under 8 points, or teeth to be brushed 4 times and gargled with 0.15% Tantum solution performed 4 times at or over 9 points. Written educational materials containing images and texts were provided to the subjects for tooth-brushing and gargling education. Gargling was demonstrated in person by the researcher and 1% Baking Soda solution and 0.15% Tantum solution worth 4 weeks were provided. Compliance with the oral care protocol was confirmed by the researcher calling the subjects once a week.

2.3.2. Stomatitis

The Oral Assessment Guide(OAG) developed by Eiler et al(1988). This tool assesses changes in 8 different categories including voice, ability to swallow, lips, tongue, saliva, oral mucosal membrane, gingiva, and teeth with ocular inspection and palpation. Rating 1 in each category means normal range; rating 2 moderate change involving edema, rubefaction, change in color and saliva viscosity; and rating 3 severe conditions involving ulceration, blooding, and infection. Ratings in the 8 categories are summed up and the score of 8 or less is regarded as normal; score of 9 to 16 moderate stomatitis; and score of 17 to 24 serious stomatitis. When the tool was developed, Cronbach's α was .85 and the Cronbach's α in this Study has been confirmed to be .90.

2.3.3. Nutrition status

Nutrition status in general was measured with the Patient Generated Subjective Global Assessment(PGSGA) developed by Bauder et al(2002) and reported to be appropriate as a nutrition assessment tool for cancer patients. The PGSGA assesses nutrition status by checking change in weight change, change in dietary intake, gastrointestinal symptom, changes in activities and functions, physical examination, diagnosis name, and metabolic stress. The higher the PGSCA score is, the poorer nutrition status is.

2.3.4. Data collection

This Study was approved by the Institutional Review Board of Wonkwang University (WKIRB-201409-SB-051), and the researcher formed sufficient rapport with adult lung cancer patients under anticancer chemotherapy in the hospital of the Medical School of Wonkwang University and explained in person the objectives of the Research, anonymity, confidentiality, and opt-out arrangements, after which the subjects confirmed checkup results in their medical records and signed the informed consent forms. The researcher gathered data from each subject twice in advance at 4-week interval and once 4 weeks after the application of the oral care protocol. The data gathering period was between May 1, 2014 to August 20, 2014.

In addition, to raise the inter-rater reliability, lung cancer patients under anticancer chemotherapy were selected at random and their OAG scores were rated for 2 weeks before the initial pre-inspection and compared and discussed among the raters to ensure the inter-rater reliability to be .80 or more.

2.3.5. Data analysis

Data gathered in this Research was analyzed as follows, using SPSS 20.0 statistics program.

Firstly, general traits of the subjects were calculated in real number, percentage, mean value, and standard deviation.

Secondly, lung cancer-related traits of the subjects were calculated in real number, percentage, mean value, and standard deviation.

Thirdly, gargling solutions in the oral care protocol of the subjects were calculated in real number and percentage.

Fourthly, difference in stomatitis of the subjects according to measurement timing was analyzed through Repeated Measures ANOVA.

Fifthly, difference in nutrition status of the subjects according to measurement timing was analyzed through Repeated Measures ANOVA.

3. Results

3.1. Characteristics of the subject

3.1.1. General characteristics of the subjects

The general traits of the subjects in this Research are described in <Table 1>.

The average age of the subjects was 67.83±7.60, with those aged 65 years or older accounting for the most, and the male subjects were 20(69.0%). In terms of education level, 18 subjects were with less than middle school graduation(62.0%) and most or 26 of the subjects were married(89.7%). In terms of their religious faith, 17 subjects were without any religious faith(58.6%), Christians 8(27.6%), and 3 Buddhists(10.3%). Most of the subjects or 27 of them(93.1%) were unemployed, 24 subjects were found to be earning less than 1 million won per month(82.8%), and the primary carers of the subject were their spouses (19, 65.5%), children(6, 20.7%), parents(2, 6.9%), and siblings(2, 6.95%). For smoking record, 15 subjects used to smoke in the past(51.7%), 11 have not smoked at all(37.9%), and 3 currently smoke(10.3%). For drinking record, 12 subjects have not drunken(48.3%), 12 used to drink in the past (41.4%), and 2 currently drink(6.95%). 23 subjects had anamnesis(79.3%), and 16 subjects were found not to use dentures(55.2%). 13 subjects were found to brush their teeth twice a day(44.8%), 12 subjects at least 3 times(41.45) and 4 subjects just once(13.8%). 23 subjects were without dental issues(79.3%), 23 subjects were without oral checkup experience, and 24 subjects were without oral care education experience(82.8%).

Table 1. General characteristics. (N=29)

Variables		M(SD)	n(%)
Age(year)		67.83 (7.60)	
Gender	Male Female		20(69.0) 9(31.0)
Education	Below Middle school Above middle school		18(62.0) 11(38.0)
Marriage	Unmarried married others		2(6.9) 26(89.7) 1(3.4)
Religion	Christian Buddhist Won-Buddhist None		8(27.6) 3(10.3) 1(3.4) 17(58.6)
Job	Yes No		2(6.9) 27(93.1)
Monthly Income (₩10,000)	Below 100 Above 100		24(82.8) 5(17.2)
Main Care Giver	Spouse Parents Siblings Children		19(65.5) 2(6.9) 2(6.9) 6(20.7)
Smoking	Present Past None		3(10.3) 15(51.7) 11(37.9)
Alcohol	Present Past None		2(6.9) 12(41.4) 14(48.3)
Past History	Yes No		23(79.3) 6(20.7)
Dentures	Yes No		12(41.4) 16(55.2)
Teeth Brushing (day)	1 2 Over 3		4(13.8) 13(44.8) 12(41.4)
Dental Problem	Yes No		6(20.7) 23(79.3)
Oral Examination	Yes No		6(20.7) 23(79.3)
Oral Hygiene Education	Yes No		5(17.2) 24(82.8)

3.1.2. Lung cancer-related characteristics of the subjects

The lung cancer-related traits of the subjects in this Research are described in <Table 2>.

The lung cancer diagnosis duration of the subjects was 13.28±14.88 on average, with 17 subjects less than a year(58.6%) and 18 subjects a year or longer(41.4%). Cancer stage at the time of diagnosis was Stage 4 for 21 subjects(72.4%), Stage 1 for 5 subjects(17.2%) and Stage 3 for 3 subjects(10.3%), with Stage 4 accounting for the majority. 20 subjects were with metastasis of cancer(69.0%) and 5 subjects were found to receive radiotherapy in combination with anticancer chemotherapy(17.2%). For anticancer drugs used in anticancer chemotherapy, PC(alimta+Cispatin) combination was used by 8 subjects(27.6%), DP(Doxotel+Cispatin), EP(Lastet+Cispatin), alimta alone and GP (Gembin+Cispatin) combination by 4 subjects respectively(13.8%) and IP(Camtop+Cistpatin) combination by 2 subjects(6.9%). As for anticancer drug administration route, administration via peripheral IV was 28 subjects(96.6%) and via Chemo Port was 1 subject(3.4%). 1 subject was found to change anticancer drug while the Research was in progress(3.4%).

Table 2. Lung cancer related characteristics. (N=29)

Variables		M(SD)	n(%)
Diagnosis Duration (Month)	Below 12 Above 12	13.28(14.88)	17((58.6) 12(41.4)
Cancer Stage	Ⅰ Ⅱ Ⅲ Ⅳ		5(17.2) 0 3(10.3) 21(72.4)
Metastasis	Yes No		20(69.0) 9(31.0)
Combine Treatment	Radiotherapy No		5(17.2) 24(82.8)
Chemo Therapy Drug	DP(Doxotel+Cispatin) EP(Lastet+Cispatin) IP(Camtop+Cistpatin) alimta PC(alimta+Cispatin) GP(Gembin+Cispatin) Others		4(13.8) 4(13.8) 2(6.9) 4(14.8) 8(27.6) 4(13.8) 3(10.3)
Drug Route	Peripheral IV Chemo port		28(96.6) 1(3.4)
Chemo Therapy Change	Yes No		1(3.4) 28(96.6)

3.2. Gargling solution as per oral care protocol

Gargling solutions applied to the subjects according to the oral care protocol are described in <Table 3>.

When the 2nd pre-measurement was performed, 3 subjects(10.3%) scored at 8 or less according to the Oral Assessment Guide(OAG) were given 1% Baking Soda gargling solution and 26 subjects(89.7%) scored at 9 or higher were given 0.15% Tantum gargling solution.

Table 3. Gargling solution as per oral care protocol. (N=29)

Variables		n(%)
Solutions	Baking Soda Tantum	3(10.3) 26(89.7)

3.3. Test of hypotheses

3.3.1. Hypothesis 1

'OAG(Oral Assessment Guide) scores of lung cancer patients receiving anticancer chemotherapy and under oral care protocol must vary, depending on timing.'

Repeated Measures ANOVA results of stomatitis rating per measurement timing of the subjects to test the effects of the oral care protocol on lung cancer patients under anticancer chemotherapy are described in <Table 4>.

Table 4. Difference of OAG by testing time. (N=29)

Source Time	Mean (SD)	Type Ⅲ Sum of squares	df	Mean square	F	p
OAG †		21.816	2	10.908	4.085	.022*
Pre 1	11.62(2.82)					
Pre 2	12.03(2.47)					
Post	10.83(2.94)					

Note: † Oral Assessment Guide, *p<.05

The OAG score of the 1st pre-investigation of the subjects was 11.62±2.82, the 2nd pre-

investigation 12.03±2.47 and the post-investigation after the application of the oral care protocol 10.83±2.94, indicating statistically significant difference per measurement timing(F=4.085, p=.022). Therefore, the 1st hypothesis stating that 'OAG(Oral Assessment Guide) scores of lung cancer patients receiving anticancer chemotherapy and under oral care protocol must vary, depending on timing.' was supported.

3.3.2. Hypothesis 2

'PGSGA(Patient Generated Subjective Global Assessment) scores of lung cancer patients receiving anticancer chemotherapy and under oral care protocol must vary, depending on timing.'

The PGSGA score of the 1st pre-investigation of the subjects was 10.35±3.38, the 2nd pre-investigation 10.13±4.11, and the post-investigation after the application of the oral care protocol 8.69±4.03, which did not satisfy the sphericity assumption of Repeated Measures ANOVA. Therefore, the results were tested with Greenhouse-Geisser method and the difference per measurement timing was statistically significant(F=7.498, p=.003). Therefore, the 2nd hypothesis stating that 'PGSGA(Patient Generated Subjective Global Assessment) scores of lung cancer patients receiving anticancer chemotherapy and under oral care protocol must vary, depending on timing.' was supported.

Table 5. Difference of PGSGA by testing time. (N=29)

Source / Time	Mean (SD)	Type Ⅲ Sum of squares	df	Mean square	F	p
PGSGA†		47.172	1.538	29.808	7.498	.003**
Pre 1	10.35 (3.38)					
Pre 2	10.13 (4.11)					
Post	8.69 (4.03)					

Note: †Patient Generated Subjective Global Assessment, *p<.05, **p<.01

4. Discussion

This Research attempted to provide basic inputs for development of nursing intervention for cancer patients by applying oral care protocol including preventative nursing intervention for lung cancer patients under anticancer chemotherapy and studying its impacts for oral safety and nutrition status.

Stage 4 accounted for 72.4% of the subjects when diagnosed, metastasis of cancer for 69%, and subjects with lung cancer diagnosed less than a year ago for 58.6%, which all back up the high mortality rate of lung cancer based on the fact that lung cancer is difficult to be found early on and already well developed in many cases when diagnosed[5].

As stomatitis occurs 2 or 3 days after administration of anticancer drug and therefore oral care of patient at home is critical in this Research, written educational materials containing images and texts were provided to the subjects for tooth-brushing and gargling education. Gargling was demonstrated in person by the researcher and 1% Baking Soda solution and 0.15% Tantum solution worth 4 weeks were provided. Compliance with the oral care protocol was confirmed by the researcher calling the subjects once a week.

Stomatitis scores of the lung cancer patients who received anticancer chemotherapy and were applied with the oral care protocol showed significant difference per timing, which indicates the considerable reduction of stomatitis score with application of the protocol and thereby its effectiveness. These results were consistent with the study results of Cheng et al(2004)[11] suggesting the effectiveness of the oral care protocol. However, the outcomes of this Research were somewhat different from the research of Shim(2012)[15] dealing with childhood cancers which found little significant difference between test group and control group. Shim(2012)[15] suggested the small size of the test group consisting of just 12 persons and the use of strong anticancer drug as possible reasons of the lack of significant difference, and indicated that stomatitis developed less in the test group than the control group. Therefore, it is found out that the oral care

protocol of this Research intended for prevention of stomatitis is a useful nursing intervention for oral safety of lung cancer patients under anticancer chemotherapy.

Nutrition status of the lung cancer patients who received anticancer chemotherapy and were applied with the oral care protocol showed significant difference per timing. In other words, it was confirmed to be consistent with the results of preceding studies that the application of oral care protocol could affect not only the oral safety of cancer patients but also their nutrition status[8]. Dietary data of cancer patients can be gathered by studying the type and amount of food actually taken or by measuring bodily change and conducting biochemical examination. This Research used the method of examining food intake frequency, whose effectiveness was limited in understanding exact amount of intake. Accordingly, subsequent studies will be required to understand nutrition status in more depth by using bodily measurement and biochemical examination outcomes. In addition, even though nutrition status seems to be improved after the oral care protocol is applied given the traits of cancer patient, more prolonged observation needs to be conducted. And, the fact that loss of appetite continues for about a week after the administration of anticancer drug, compromising dietary intake status is somewhat different from the results of Park et al(2010)[16] who provided continued dietary training and oral mucosal inflammation care to blood cancer patients to study subsequent effects on nutrition status and concluded that clear change in nutrition status was not noticeable. This might have resulted from the fact that the research by Park et al(2010)[16] provided high-dose anticancer chemotherapy for transplantation of stem cell which resulted in higher likelihood of nausea or vomiting including stomatitis that ordinary anticancer chemotherapy and thereby compromised dietary intake amount considerably. Therefore, to enable long-term effects of the oral care protocol to materialize, the oral care protocol needs to be applied continuously as a part of nursing intervention, and actual increase in dietary intake amount must be measured in consideration of the side-effects of anticancer chemotherapy including nausea and vomiting.

5. Conclusion & Suggestion

As discussed in the above, the oral care protocol in this Research had beneficial effects on nutrition status of lung cancer patients under anticancer chemotherapy by mitigating their stomatitis and improving nutrition status across the board. Therefore, it was confirmed that the oral care protocol is a useful nursing intervention effective in improving oral safety and nutrition status of lung cancer patients under anticancer chemotherapy.

Therefore, following suggestions are made based on this Research:

Firstly, as the oral care protocol in this Research including preventative care is confirmed to be a useful nursing intervention on lung cancer patients under anticancer chemotherapy, it needs to be applied continuously.

Secondly, as this Research covered only lung cancer patients under anticancer chemotherapy, it needs to be extended to patients suffering from other types of cancer or chronic ailment to build a basis for nursing of them.

Thirdly, the oral care protocol developed in this Research needs to be updated to include oral examination or dental care, etc. to deliver more refined oral care protocol.

Fourthly, as this Research has found out that oral care is critical for improving stomatitis and nutrition status of lung cancer patient, oral care needs to be emphasized in cancer patient education program.

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Lead Author
Kim Won-jeong / Ewha Womans University Researcher
B.A. Wonkwang University
M.A. Wonkwang University
Ph.D. Ewha Womans University

Research field
- The Autonomy, Nursing Performance based on the Awareness and Satisfaction of EMR System for Nurses, Journal of Academia-industrial technology, 16(9) (2015).
- A Comparison of the Understanding of the Withdrawal of Life-sustaining Treatment between Intensive Care Unit Nurse and Patients' Family Members, Korean Journal of Ethics, 18(4) (2015).

Major career
- 2012~2015. Wonkwang University Hospital, RN
- 2018~2019. Wonkwang University, Practice Assistant

Corresponding Author
Kang Ji-sook / Wonkwang University Professor
B.A. Ewha Womans University
M.A Ewha Womans University
Ph.D. Ewha Womans University

Research field
- The Autonomy, Nursing Performance based on the Awareness and Satisfaction of EMR System for Nurses, Journal of Academia-industrial technology, 16(9) (2015).
- Effect of Uncertainty and Resilience on Stress for Cancer Patients, Korean Journal of Stress Research, 26(3) (2018).

Major career
- 2006~2009. Ewha Womans University, Researcher
- 2010~present. Wonkwang University, Professor

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Corresponding author
E-mail: khnam@kosin.ac.kr

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Development of ICT-Based Simulation Scenarios against the CRISIS of Dyspnea Patients

Kang Ki-noh[1]
Masan University, Changwon, Republic of Korea
Nam Keum-hee[2*]
Kosin University, Busan, Republic of Korea
Kim Jung-ho[3]
Masan University, Changwon, Republic of Korea
Ju Sung-ju[4]
IBST Co, Changwon, Republic of Korea
Kim Heui-yeoung[5]
Donga University Hospital, Busan, Republic of Korea

Abstract

Simulation is drawing attention in student education as a means of patient safety in today's hospital and medical environments. We have tried to raise the ability to cope with situations through various cases through simulations in nursing education. In order to improve the adaptability of clinical nurses to graduate nurses who have to become increasingly complicated and have a high degree of nursing care, simulation training has become an essential curriculum. As a core competency in nursing education, Critical thinking skills and communication skills. The purpose of this study was to develop simulated learning scenarios, which is ICT-based to be applicable as virtual reality programs, in order to cope with the crisis of dyspnea patients who visit the hospital. The study was made from March 10th, 2018 to Feb. 10th, 2019 in which the research developed simulated learning scenarios, algorithms and assessment tables and tested the content validity of the scenarios. In this study, we conducted physical assessment and immediate emergency management of patients with basic dyspnea as Level 1 basic stage to enable stepwise learning of scenarios in nursing situation of respiratory distress crisis. Level 2, which is deepening level, we know how to assess the symptoms of respiratory insufficiency, and aim at differentiating patients, medication, and first aid treatment. Level 3, an integration stage, was designed to allow additional assessment of patients with dyspnea and role-sharing among clinicians, appropriate communication, and level-specific learning that aims to serve as a team leader. The developed simulation scenarios that respond to dyspnea patients in crisis are expected to provide basic information that will be applicable to a variety of education processes in the future.

[Keywords] ***Crisis, ICT, Simulation, Dyspnea, Patients***

1. Introduction

1.1. Necessity of the research

Recently, there are a lot of efforts of finding ways to help nursing students raise and improve the skills of adjustment and problem-solving in complicated clinical situations[1]. One of the ways is simulated education that allows nursing students to experience clinical situations that are similar to actual ones rather than just learning nursing knowledge or skills[2]. The simulative way of education is being given more and more importance because it is fact that the opportunity for nursing students to experience clinical practices is becoming less and less due to patients' higher expectations and demands and shorter hospitalization[1]. By the way, there are already many researches coming out to demonstrate that the simulation-based nursing education is so useful to nursing students[3].

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Currently, there are already many different ways of simulated education in the nursing science. They include using mannequins for learning basic skills, the human patient simulator that is based on scenarios to work with standardized patients and the computer simulator that ensures high fidelity[4].

More importantly, it's has been reported that simulation-based nursing education using scenarios allows nursing students to learn and improve the skills of communicating with patients, caretakers or medical personnel, managing patient safety, making interdisciplinary cooperation with medical professionals and taking control of clinical situations that are hard to deal with[5]as well as to become more confident in performing clinical practices or solving related problems[6][7].

Scenarios for simulated education are required to integrate theory and reality, especially by allowing learners to experience situations that may exist in the reality. This suggests it's important that those scenarios should be set up by medical practitioners such as clinical experts and instructors to be composed of medical professional-patient conversations in situations that may be actually found in the hospital[8]. In doing so, the scenarios can be more realistic because it deals with both clinical situations and basic skills to cope with them. Also, the scenarios can be a means with which instructors evaluate how well their nursing students solve clinical problems that they may virtually face.

Earlier contents of the simulation-based nursing education in Korea were mostly an modification or supplementation of scenarios from foreign countries, so many of them were not suitable to nursing situation in this country. Recently, however, there are increased local developments of different simulation-based education using scenarios that focus on patients having different diseases. Those developments include simulation scenarios that are responsive to particular clients such as colonoscopy[9], diabetes[10], obstetric[11] and schizophrenia patients[12]. Unfortunately, however, there's been little research to develop such scenarios against the crisis of dyspnea patients. Especially, it's rare to try developing simulation scenarios focusing on patients with dyspnea of cardiac origin, even though we already have such scenarios developed for the management of asthma patients.

The purpose of this study was to develop simulated learning scenarios that are used to learn how to cope with the crisis of dyspnea patients who visit the hospital. Dyspnea patients are increasing every year. For them, treatments should be offered in quick and effective manners[13]. Dyspnea may fall both patients and their caretakers into trouble. In this case, nurses need to perform assessment, intervention and differential diagnosis in quick and accurate ways. For the performance, nurses are required to be prepared through education whose contents have yet to be properly researched and developed. Thus, the important thing is to create education programs through which nursing students make themselves more competent in coping with the crisis of dyspnea patients or, in other words, accurately assessing and treating the patients who have faced trouble due to dyspnea that might have many different causes. More specifically, it's urgently needed to develop scenarios based on which nursing students can be well-trained to quickly perform differential diagnosis and emergency action in working with patients who suffer dyspnea of cardiac origin.

In general, by the way, most of simulated nursing education is provided inside the training room that is often subject to limitations in terms of time and space and in terms of the use of expensive simulation equipment, number of students who use the place, costs spent in the use of the room and the reproduction of actual clinical situations. What would overcome the limitations is ICT-based virtual reality programs that need no use of expensive simulation equipment and that allow learners to experience nursing situations, which are given in form of scenario, efficiently anytime and anywhere and instructors to efficiently monitor and evaluate the learners' performance.

Thus, what this study really sought to provide is simulated learning scenarios that nursing students use to learn how to cope with the crisis of dyspnea patients at the hospital provided the development is a preparation for the creation of ICT-based virtual reality programs that would be

used implemented for simulated learning education purposes. The scenarios developed here ultimately aims to help nursing students improve their own skills of critical thinking and problem-solving in working with dyspnea patients in crisis.

1.2. Purpose of the research

This study had the purpose of developing simulated learning scenarios that are responsive to dyspnea patients in crisis who visit the hospital and that the research finally hopes to apply to ICT-based virtual reality programs.

2. Methods

2.1. Research design

This study is a methodological research designed to develop simulation-based learning scenarios to work with dyspnea patients in crisis and then determine the applicability of the scenarios.

2.2. Procedures

2.2.1. Development process of simulation scenarios

In order to develop scenarios that would be finally a part of ICT-based virtual reality programs, this study utilized ADDIE(Analysis, Design, Development, Implement, Evaluation) Model that allows interactions between instructors and learners <Figure 1>. That model has often used to devise teaching methods for customer-oriented education programs in which learners' needs are reflected[14] and, more recently, to develop scenarios for simulated nursing education[15].

1)In order to create scenarios that would be finally applied to ICT-based virtual reality programs for simulated nursing education, first of all, this study reviewed prior research and examined 20 clinical nurses' requirements for the education. Here, those clinical nurses were currently instructing the field training of nursing students. They were also those who are in the level of proficient in accordance with Benner's skill acquisition theory and have a master's degree or higher and over 5 years' clinical careers.

2)This research divided the above mentioned 20 nurses into 4 groups, based on one 5-nurse group for one hospital, and made focus-group interviews with them about main diseases that they face in clinical situations and about education for nursing students.

3)Topics that the nurses said in the focus-group interviews should be those of education for nursing students were prioritized in terms of clinical and educational importance through the AHP(Analytical Hierarchy Process) analysis by 5 professors who had careers of at least 5 years' service at the tertiary general hospital and were currently teaching adult nursing at college.

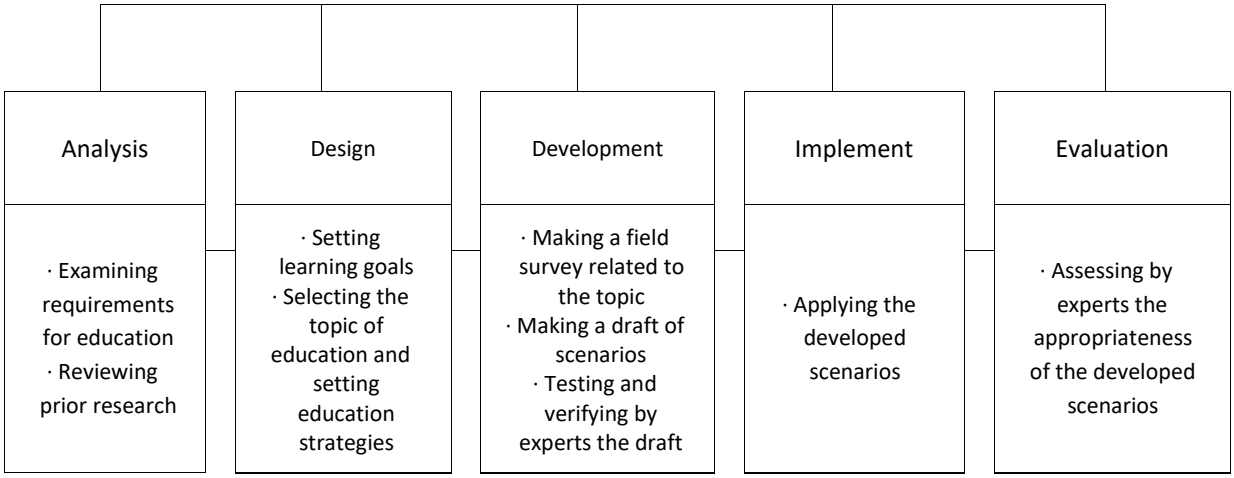
4)This study narrowed the prioritized topics to 6 that nursing students rarely deal with during the clinical practice training because of the clinical importance of relevant disease or patients' privacy or safety. The six topics included diabetes-related situations, nursing with the endoscopy, pre- and post-operation nursing, crisis of dyspnea patients and bleeding from gastrointestinal tracts. And then, the study put top priority on the crisis of dyspnea patients and designated it as the topic of simulated education for which scenarios are to be developed here, For that topic, this research set learning goals and educational strategies. By the way, the learning goals were set for each of levels 1, 2 and 3 with the current curriculum of nursing science education taken into consideration.

5)A draft of scenarios were made based on the above mentioned top-priority topic, learning goals and education strategies, and their content validity was tested and verified by experts. To integrate the crisis examples of dyspnea patients with the scenarios, then, the study referred to medical clinical records for some dyspnea patients who had ever been in a 400-bed general hospital located in K city. From the records, the health state and past disease history of the patients, treatments, cures and basic nursing skills actually applied to them and demands that were actually made by the patients or their caretakers in emergency were identified, and all of these information were reflected in making the draft. As it was tested and verified in terms of content validity by 5 experts(1 expert in emergency medicine1 scholastic director for the Korea Medical Simulation Society, 3 university hospital nurses who have over 7 years' clinical ca-

reers), the draft was modified and supplemented to be complete and perfect as much as this study initially hoped, through which a final version of scenarios was developed.

6)The developed scenarios were examined by 1 scholastic director for the Korea Medical Simulation Society and 3 professors of nursing in charge of simulated adult nursing education classes at college, and found to be appropriate for simulated learning.

Figure 1. Development process of simulation scenarios in accordance with ADDIE model.



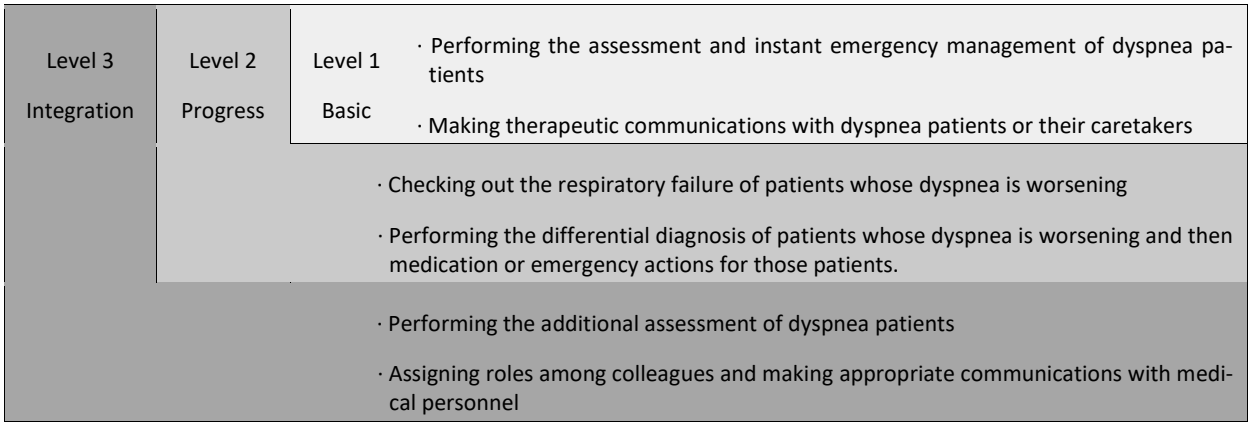
3. Results

3.1. Development of simulated learning scenarios

3.1.1. Setting learning goals

Simulated learning to cope with the crisis of dyspnea patients has several goals such as shown in <Figure 2>. As are seen in the figure, those goals are sub-grouped for each of the three levels that are set up under the current curriculum of nursing education. For level 1 or <basic level>, the simulated education aims to make nursing students in their 2nd year, who have completed courses like basic nursing, health assessment, pathological physiology and pharmacology, become capable to perform the physical assessment and instant emergency management of dyspnea patients and make therapeutic communications with those patients. For level 2 or <progress level>, next, the simulated education has the objectives of making nursing students in their 3rd year, who have learned the theory of adult nursing, master the skills to assess the respiratory failure of patients whose dyspnea is worsening, perform the differential diagnosis of those patients and then medication or emergency actions for the patients provided those students have already achieved the learning goals for the previous level. For level 3 or <integration level>, finally, the simulated learning needs nursing students in their 4th year, who have completely learned the theory of adult nursing and completed the training of nursing practices for adult, emergency and ICU patients, to become truly competent for performing the additional assessment of dyspnea patients, assigning roles among colleagues, making appropriate communications with medical personnel and leading the nursing team leader provided those nurses have already achieved learning objectives for the two previous levels.

Figure 2. Level-based goals of simulated learning against the crisis of dyspnea patients.



3.1.2. Clinical case for simulation scenarios

The following is about a virtual case of dyspnea whose clinical information will be offered to nursing students prior to simulated education using scenarios developed here.

The case is a 62-year-old man named Mr. Km. He visited the emergency room 3 hours after his dyspnea began to worsen. He had been suffering a cold with the symptoms of cough and phlegm for 5 days before coming to the emergency room. The smoked one pack of cigarettes a day for the last 30 years. It's been 10 years since he was diagnosed with hypertension and diabetes. Since then, he has been taking medication so that the levels of his blood pressure and blood sugar are currently being kept relatively normal. His main caretaker is wife who are very anxious about the dyspnea of her husband.

When first encountered, the male patient is seen sitting on the bed with his upper body leaned forwards at the emergency room, where he is panting out just relying on accessory respiratory muscles. Every time the patient breathes in and out, his face becomes so much drawn with pain. It's so hard for him to put out a word. His wife or the main caretaker appears to be so angry as she urgently voices immediate medical actions for her husband.

3.1.3. Flow of simulation scenarios

Simulation scenarios developed here are comprised of three parts, that is, levels 1 to 3 which are supposed to be proceeded in sequence. First of all, the scenarios of level 1 contain the training of skills needed to properly perform the physical assessment of a particular dyspnea patient, who is the virtual clinical case mentioned above, make therapeutic communications with that patient and implement emergency actions for him. Those skills are, more specifically, those of checking vital signs, measuring oxygen saturation, monitoring and applying the nebulizer. Participation in the training using the first-level scenarios requires nursing students to have already completed courses like basic nursing, health assessment, pathological physiology and pharmacology. It takes less than 5 to 7 minutes to finish that training.

Next, the scenarios of level 2 assumes that the above mentioned dyspnea patient is in worse shape despite he's got the supply of oxygen, medication with the bronchodilator and the application of the nebulizer adequately. Under this assumption, the same level seeks to train nursing students about the additional assessment of the male patient and how to communicate with him or his caretaker about oxygen supply through the nasal cannula, application of the nebulizer and medication with the bronchodilator. This level takes less than 12 to 15 minutes for its participants to complete.

Finally, the scenarios of level 3 lead nursing students to try finding that the patient's dyspnea is of cardiac origin based on a comprehensive understanding of the results of ABGA, Lab, EKG and chest CT and then and making additional treatments for him. The scenarios also lead nursing students to try making themselves prepared to take instant actions such as tracheal intubation in case that the patient's respiratory failure is going on. Anyway, the third-level scenarios

range from accurately interpreting the test results of the dyspnea patient given by the instructor to making appropriate communications with medical personnel and to practicing proper treatments for the patient. This process takes less than 20 minutes to go through <Table 1>.

Table 1. Scenarios flow.

Process	Questions or description by the nursing student(nurse)	Present state	Verbal expression by the patient
First encounter	· Introduce themselves to the patient. · Identify the patient's name and registration number by asking open-ended questions.	The patient is sitting on the bed at the emergency room, where he is panting out just relying on the accessory respiratory muscles.	[Patient] (frowning so much each time when breathing in and out with the body learning forwards) Oh, my! [Caretaker] (in an urgent voice) Take a quick action for him, please!!
Level 1 Basic	· Assess symptoms that the patient has. · Measure vital signs including oxygen saturation. · Get the patient to take a fowler's or semi-fowler's position. · Inform problems with the patient to the doctor.	Outer appearance of the patient ■ Confusedness He is very difficult in breathing with the shoulders moving up and down, sweats, the nostrils flared and the lips turned blue(cyanosis). ■ Abnormal sounds of breathing Wheezing, rhonchi or rales is heard when the patient breathes, especially from the lower lung field. ■ V/S: BP 150/85 mmHg, EKG: sinus thachycardia(112/min), RR 28/min, SpO2 88%, BT 37.8	[Patient] (Breathing in a short and shallow pace) hard to breathe. [Patient] I had a touch of cold for a couple of days. and I have been difficult in breathing for the last few hours. I feel heavy, umm.. (hissing) [Caretaker] call the doctor right now!!
Level 2 Progress	· Supply oxygen to the patient following the ABGA test. · Apply the nebulizer to the patient after describing him the purpose and effect of the application.	■ V/S: BP 160/90mmHg, EKG: sinus thachycardia(110/min), RR 28/min, SpO2 85%, BT 37.6	The patient is in the bed getting more and more difficult to breath. [Patient] (Frowning so much each time when breathing in and out, looking powerless and exhausted)I...feel...breathless..too much... [Caretaker] (in an urgent voice) Take a quick action for him!! Why is he getting worse?
Level 3 Integration	· Describe the patient's present state and future treatment plans to him and his caretaker. · Make appropriate communications with medical personnel based on a comprehensive understanding of the test results like ABGA, Lab, EKG and chest CT. · Assess the consciousness of the patient, manage the caretaker and make preparations for the use of the defibrillator, emergency drugs medication or intubation.	■ He is wholly exhausted just breathing hard with sweats and the lips turned blue(cyanosis). ■ Abnormal sounds of breathing Wheezing, rhonchi or rales is heard when the patient breathes, especially from the lower lung field. ■ V/S: BP 75/40mmHg, EKG: VT, RR 32/min, SpO2 85%, BT 37.2	[Patient] Keeping lying in the bed without responding to calls [Caretaker] What's wrong with him!! Why is he getting worse and worse(in an angry voice)
Finish	The overall process of simulation scenarios completely finishes when the nursing student finds herself going to take an appropriate action after discovering that the dyspnea of the patient is of cardiac origin.		

4. Discussion

This study sought to provide simulation scenarios that cope with the crisis of dyspnea patient visiting the hospital, which the research hopes to finally integrate into ICT-based virtual reality programs for simulated nursing education that are expected to be developed in the future. The scenarios has the ultimate goal of making nursing students raise and improve the skills of critical thinking and solving nursing problems in working with dyspnea patients in crisis.

Dyspnea patients may likely to get worse, confusing themselves and their caretakers so much. To cope with the crisis, nurses should perform quick and accurate measures for the patient such as initial assessment, intervention and differential diagnosis. This is why education programs are needed, which allow nursing students to learn how to assess and treat dyspnea patients in a quick and accurate way.

Simulation scenarios developed here, first of all, seek to make nursing students learn and practice actions that should be initially taken for dyspnea patients in crisis, which includes getting the dyspnea patient to take the semi-Fowler's position, keeping monitoring of the patient, making the ABGA tests, measuring oxygen saturation, supplying oxygen and hearing sounds from the patient's lung and applying the bronchodilator, with references to the Global Initiative for Asthma Guidelines[16] and Yang's[17] research. Overall, the developed scenarios are about a process ranging from performing the initial assessment of the dyspnea patient to taking instant emergency actions for them, making the differential diagnosis in order to clearly identify the fundamental causes of the patient's health problem and to performing the additional or continual assessment of the patient under treatment. This way that the process is comprised of is based on Braithwaite & Pernia's[18] Algorithm for the Nursing Care of Dyspnea Patients. Before developing scenarios, by the way, this study utilized the ADDIE model to investigate problems with the clinical nursing of dyspnea patient, and produced a virtual clinical case to be integrated into the simulation materials that were, after developed, tested and verified by experts.

As they go through the developed scenarios, this study hopes, nursing students can realize that it's not enough just to do the initial assessment of dyspnea patients in crisis and take an emergency action for them, but it's necessary to keep their eyes on the state of the patient and prevent them from falling to serious outcome. Also, the learners can find themselves deeply sympathizing with the dyspnea patient and their caretaker who are so much confused about.

The developed scenarios are divided into three parts, that is, levels 1, 2 and 3 that are applied to nursing students in their 2nd to 4th years, respectively, and associated with learning goals for each of those years. The biggest difference between this study and other works[7][8][9] concerning the development of simulated nursing education is that the latter have been, in most cases, for nursing students in their 4h year. In other words, this research is so meaningful in that it provides simulation scenarios that allow nursing students to learn and practice more profoundly as they become higher in their year of college in conjunction with the current curriculum of nursing education.

Scenarios developed here that is used to make nursing students learn how to cope with the crisis of dyspnea patients and that will have been applied to ICT-based virtual reality programs for simulated nursing education, this study expects, provide basic information useful to develop other scenarios in relation to lots of different clinical situations.

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Lead Author
Kang Ki-noh / Masan University Assistant Professor
B.A. Kyunghee University
M.A. Ewha Womans University
Ph.D. Korea University

Research field
- Factors Affecting Early School-age Children's Subjective Happiness: Using the Actor-partner Interdependence Model of Parental Variable, Journal of Korean Academy of Nursing, 47(6) (2017).
- Effects of Social Support and Self-efficacy on the Psychosocial Adjustment of Korean Ostomy Patients, International Wound Journal, 16(S1) (2019).

Major career
- 2017~present. Korea Society for Simulation in Healthcare, Edition Staff
- 2018~present. Korean Journal of Critical Care Nursing, Thesis Judge

Corresponding Author
Nam Keum-hee / Kosin University Assistant Professor
B.A. Kosin University
M.A. Yonsei University
Ph.D. Kosin University

Research field
- Mediating Effects of Empathy and Resilience on the Relationship between Terminal Care Stress and Performance for Nurses in a Tertiary Hospital, The Korean Journal of Hospice and Palliative Care, 20(4) (2017).
- Effects of Social Support and Self-efficacy on the Psycho Social Adjustment of Korean Ostomy Patients, International Wound Journal, 16(S1) (2019).

Major career
- 2018~2019. Masan University, Assistant Professor
- 2019~present. Kosin University, Assistant Professor

Co-Author
Kim Jung-ho / Masan University Assistant Professor
B.A. Kyunghee University
M.A. Kyunghee University
Ph.D. Kyunghee University

Research field
- Factors Affecting Early School-age Children's Subjective Happiness: Using the Actor-partner Interdependence Model of Parental Variable, Journal of Korean Academy of Nursing, 47(6) (2017).
- Validity and Reliability of a Korean Version of Yale Food Addiction Scale for Children(YFAS-C), Journal of Korean Academy Nursing, 49 (1) (2019).

Major career
- 2016~present. Korea Association of Mental Health Professional, Director
- 2017~present. Academician, Korea Society for Simulation in Nursing

Co-Author
Ju Sung-ju / IBST Co.
B.A. Hanyang University
M.A. Changwon National University

Research field
- Development of ICT-based Simulation Scenarios against the Crisis of Dyspnea Patients, International Journal of Crisis & Safety, 4(1) (2019).

Major career
- 2010~present. IBST Co. Chief Executive Officer

Co-Author
Kim Heui-yeoung / Donga University Hospital WOCN
B.A. Korea National Open University
M.A. Donga University
Ph.D. Kosin University

Research field
- The Experience of Uncertainty in Cancer Patients Undergoing Chemotherapy, Asian Oncology Nursing, 18(3) (2018).
- Effects of Social Support and Self-efficacy on the Psychosocial Adjustment of Korean Ostomy Patients, International Wound Journal, 16(S1) (2019).

Major career
- 1990~present. Donga University Hospital, WOCN
- 2007~present. APN in Korea Gerontological Nursing

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Needs Analysis for Adult Learners at Technical Colleges for the Improvement of Lifelong Education Center Programs in KOREA: with Priority given to Needs, Importance, Requests for Improvement and Requests for Supplementation Includes SAFETY

Shin Hye-sun[1]

Yeoju Institute of Technology,Yeoju, Republic of Korea

Park Sun-jung[2*]

Yeoju Institute of Technology,Yeoju, Republic of Korea

Abstract

The purpose of this study was to make a descriptive research study to examine the educational needs of adult learners for lifelong education centers, their importance awareness, requests for improvement and requests for supplementation. The subjects in this study were the adult learners who were taking one or more course(s) in the lifelong education centers of five different technical colleges located in Gyeonggi Province. A survey was conducted from May 1 to June 30, 2018, and the answer sheets from 396 learners were gathered and analyzed. As for analysis, SPSS version 23.0 for Windows was used to obtain statistical data on frequency, percentage, mean and standard deviation. Concerning the program needs of the adult learners, what they participated in lifelong education programs for was analyzed, and they felt the most needs for "the acquisition of new knowledge and skills." In regard to importance, the item that they responded the most in the area of learning environments is that "the center is convenient for transportation and easily accessible." The item that they did the most in the area of instructional design is that "the lecturers have a professional knowledge of or competence in what they teach." The item that they did the most in terms of the content and quality of the programs is that "I have felt a sense of unity or fellowship with my peer learners." As a result of analyzing what needed to be improved or supplemented in the lifelong education programs, they pointed out "the way of running the center and programs," "good educational facilities," "learner-centered evaluation," "courses geared toward acquiring practical job skills" and "lifelong education for the sake of local residents." In order for lifelong education centers to satisfy national and social needs and the needs of adult learners for lifelong education, it seems important above all to keep track of the learning needs of learners and to reflect their needs in developing and operating lifelong education programs.

[Keywords] ***Safety, Lifelong Education Center, Adult Learner, Needs, Importance***

1. Introduction

The environmental changes including aging, globalization, the emergency of knowledge and information society and localization have raised concern for lifelong learning, and there are growing individual and social concerns for lifelong education along with support from the central and local governments[1].

In our country, the National, Municipal and Provincial Institutes for Lifelong Education have been established since the lifelong education act was revised in 2007, and there are 14 Municipal and Provincial Institutes for Lifelong Education[2].

Lifelong education means living, lifetime and education, and that is the integration of education conducted in a lifetime and refers to all forms of formal and informal learning activities that are performed in a lifetime to improve the

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quality of personal and social lives on a continual basis[3].

Lifelong learning spreads among people in general, and there is an increase in demand for leisure education and the need for lifelong education. As learners have more chances to learn thanks to mounting leisure time, demand for lifelong education is on the rise. To cope with this situation, the roles of community education as a source of learning is expected to become far greater[4]. Lifelong education facilities have been expanded since there are various local lifelong education centers which are affiliated with civic and social organizations and organs of public opinion or which are run by local governments, corporations, civic groups or colleges[5]. Out of these lifelong education centers, adult learners prefer college lifelong education centers because they are especially well equipped with human, material, knowledge and information resources available, and they are highly regarded in terms of learningefficiency[6]. Therefore it's quite important to make research to determine the psychosocial variables of lifelong learners at colleges and the relationship between their variables and the management of the lifelong education centers to enhance the operating effectiveness and efficiency of these centers. Jang's study[6] found that the local residents wanted to experience lifelong learning in their local community which was the space of daily life. Accordingly, local communities should perform the role of learning society that stimulates the learning needs of every local resident and group and provides them with learning opportunities[7].

As lifelong education becomes the norm in aging society, the quality of lifelong education centers should be taken into account in order to step up the further universalization of lifelong learning and make lifelong education part of everyday life. That is, whether these centers develop and offer diverse, specialized and creative programs to meet the learning needs of learners should be considered, and it's needed to grasp the learning needs of learners as one of the vital elements of adult lifelong learning[8]. It is possible to raise the satisfaction of adult learners with lifelong education in consideration of their needs and importance awareness when their needs are accurately analyzed to find out what they mainly ask for and what is important. So their learning needs should precisely be understood as one of important things that should be considered in adult lifelong learning.

So far, studies have mostly investigated the learning outcome of adult learners in college lifelong education centers[2]. The new roles and functions of colleges as lifelong education institutions[9][10]and the concept and characteristics of adult college students[4][11].

In order for college lifelong education institutes to satisfy national and social needs and the needs of local residents for lifelong education, it's more important than anything else to analyze the learning needs of learners and to reflect them in developing and managing lifelong education programs. The purpose of this study was, therefore, to examine the needs of adult learners for lifelong education and their priorities for importance and details in need of improvement and supplementation in an effort to provide some rationale on the development of educational programs for lifelong education centers and on the methods of education.

2. Experimental Methods

2.1. Research design

This study is a descriptive research study to determine the needs and importance awareness of adult learners for lifelong education.

2.2. The subjects and data collection

The Subjects in this study were 410 adult learners who were taking one or more course(s) in lifelong education centers attached to five different technical colleges located in Gyeonggi Province. After the purpose of this study was explained in writing, 410 adult learners who understood it and voluntarily agreed to participate

were selected. And then the answer sheets from 393 respondents were analyzed except for 14 incomplete ones. As for sample size, 270 subjects were required at least when it was calculated at 95% power, the .05 level of significance and .15 effect size, which was about medium, by G*Power 3.1.5[12] that is a program to analyze statistical power. Data were gathered from May 1 to June 30, 2016, by this researcher and a surveyor who understood the purpose of this study and was trained to give exact explanations and replies about the survey. The subjects who understood the purpose of this study and how to fill out the questionnaire and who voluntarily agreed to participate were surveyed, and then they were provided with small gifts.

2.3. Instrumentation

1. The Needs of the Adult Learners

The questionnaire used in this study consisted of the items that were modified after being extracted from Needs Analysis for Lifelong Education[13], from Needs Analysis for Community Center Lifelong Education[2]and from Lifelong Education Needs Analysis for Local Residents[3]. The items covered personal characteristics, lifelong education awareness, expectations for lifelong education, satisfaction with it and needs for it to make a statistical analysis.

2. The Importance Awareness of the Adult Learners

The instrument used in this study was Jung's[16] Inventory for Lifelong Educator Competencies and Subitems, which was used after being modified and complemented in accordance with the intent of this study.

3. The Requests of the Adult Learners for the Improvement and Supplementation of Lifelong Education Programs

The instrument used in this study was Jung's[16] Lifelong Education Items, the items used in Needs Analysis for Lifelong Education[14], and the items used in Needs Analysis for Community Center Lifelong Education[15]. All the items were used after they were modified and supplemented in accordance with the intent of this study.

2.4. Data analysis

The collected data were analyzed by SPSS version 23.0 for Windows to obtain statistical data on real number, percentage, mean and standard deviation for general characteristics, needs and importance awareness, and Cronbach alpha coefficients were calculated to verify the reliability of the instruments.

3. Results

3.1. The general characteristics of the subjects

The men numbered 165(41.7%), and the women numbered 231(58.3%). They were at the average age of 45. By academic credential, the college graduates made up the largest group that numbered 112(28.3%). As to lifelong education experience, 206 respondents(52.1%) had no experience, and 189 respondents(47.7%) had that experience. The most common monthly income that was earned by 122 respondents(20.8%) was between 2 and 2.99 million won. Regarding current occupation, the biggest group that numbered 105(26.6%) had no occupation see <Table 1>.

Table 1. Socio-demographic characteristics.

Characteristics	Category	n(%)
Gender	Male	165(41.7)
	Female	231(58.3)
Age	45.03±6.95	
Academic credential	Elementary school	7(1.8)
	Middle school	21(5.3)
	High school	158(39.9)
	Technical college	98(24.7)
	College or higher	112(28.3)
Marital status	Unmarried	152(38.4)
	Married	244(61.7)

Lifelong education experience	Experience	189(47.7)
	Not experience	206(52.1)
Income	Less than 2 million won	99(25.0)
	200-299 million won	122(30.8)
	300-399 million won	102(25.8)
	400-499 million won	32(8.1)
	500 million won or more	41(10.3)
Job	Professional	95(24.0)
	Administration, management, office work	86(21.7)
	Finance, sales	56(14.1)
	Labor, production	54(13.6)
	None	105(26.6)

3.2. Program needs

As for the goal of participating in lifelong education programs, it's ascertained that they felt the most needs for "the acquisition of new knowledge and skills". "Concerning their favorite way of lifelong learning", they wanted to "attend lectures and learn in person". Regarding the right institution for lifelong education, they preferred "colleges or lifelong education centers". As to the right lecturers for lifelong education center programs, "invited high-profile lecturers or experts" were preferred. In regard to the weekly frequency of lifelong education programs, "twice a week" was considered appropriate". As for the number of hours for each program at a time, "approximately two hours" were considered advisable. As a result of asking when these programs should be conducted, "afternoon on weekdays" was preferred. As to appropriate program length, they wanted to participate for one to less than three months" if they would do it. As a result of asking how the lifelong education center programs offered by colleges was of help, these programs were considered to be useful in "developing abilities and acquiring new knowledge" see <Table 2>.

Table 2. The program needs of the adult learners.

Characteristics	Category	n(%)	M/SD
1. The goal of participating in lifelong education programs	Acquisition of new knowledge and skills	108(27.3)	3.15± 1.891
	Better chances for employment or promotion	77(19.4)	
	Getting recognized in society by earning credits or obtaining a degree	47(11.9)	
	The delight of learning itself	53(13.4)	
	Broader human relations	46(11.6)	
	Injecting vitality into life	56(14.1)	
	Making good use of leisure time	9(2.3)	
2. Favorite way of lifelong learning	Over the internet	53(13.4)	2.61± 1.185
	Attend lectures and learn in person	196(49.5)	
	Counseling over the telephone	31(7.8)	
	Small peer group	87(22.0)	
	Learning club	29(10.1)	
3. The right Institution for lifelong education	College or lifelong education center	205(51.8)	2.40± 1.609
	Religious bodies or facilities	12(3.0)	
	Community center, civic center, city hall, etc.	55(13.9)	
	Cultural facilities (library, cultural institute, etc.)	80(20.2)	
	Cultural center (department store, mass organs of public opinion, etc.)	31(7.8)	
	Social welfare center or senior welfare agency	13(3.3)	
4. The right lecturers for	Professor of the college who is an expert in the field	159(40.2)	1.72± .687

lifelong education programs	Invited high-profile lecturer or expert	193(48.7)	
	Local celebrity	43(10.9)	
5. Appropriate Weekly Program frequency	Once a week	155(39.1)	1.71± .647
	Twice a week	201(50.8)	
	Three times a week	40(10,1)	
6. The appropriate number of hours for these programs at a time	About an hour	78(19.7)	2.05± .748
	About two hours	243(61.4)	
	About three hours	57(14.4)	
	About four hours	18(4.6)	
7. Appropriate time zone for lifelong education programs	Morning on weekdays	74(18.7)	2.50± 1.122
	Afternoon on weekdays	168(42.4)	
	Vacation	43(10.9)	
	Afternoon on the weekend	111(28.1)	
8. The appropriate program length	Less than a month	28(7.1)	2.71± 1.048
	One to less than three months	165(41.7)	
	Three to less than six months	129(32.6)	
	Six months to less than a year	46(11.6)	
	One to less than two years	20(5.1)	
	Two years or more	8(2.1)	
9. The benefits of programs offered by the college lifelong education centers	Being aware of the changes of the times and consequent overall social climate	65(16.4)	2.76± 1.366
	Developing abilities and acquiring new knowledge	137 (34.6)	
	Enjoying a hobby or making use of leisure time in a meaningful manner	92(23.2)	
	Getting a job or earning extra money	5413.6)	
	Obtaining information on child education	266.6)	
	Putting confidence on the school thanks to stronger bond among the school, family and local community	21(5.3)	

3.3. Preferred lifelong education courses

The programs in which they wanted to participate were educational programs about hobby, leisure and sports. Specifically, "drawing and art-work appreciation education" were chosen the most as the lectures that they wanted to attend. In terms of basic cultural education, they chose education about "tea ceremony and life manners". In terms of health education, they chose "basic therapeutic skills such as hand acupuncture, foot massage and sport massage". Finally, "courses that aimed at nurturing professional leaders" were chosen in terms of job skills education see <Table 3>.

Table 3. Preferred lifelong education courses.

Characteristics	Category	M/SD
Education on hobby, leisure and sports	Playing musical instruments, singing, music appreciation education	4.54±1.130
	Acquiring motor skills such as swimming, table tennis, and golf	4.70±.931
	Crafts education including Korean-paper crafts, paper clay, origami and beads	4.16±1.102
	Drawing and art-work appreciation education	4.76±.895
	Acquiring the skills of baduk and Korean chess	4.67±1.102
	Acquiring the skills of dance	3.60±1.329
	Acquiring home-related skills such as cooking, handicraft and floral arrangement	4.11±1.124
Basic cultural education	Acquiring a foreign language	4.54±1.006
	Computer literacy education, digital literacy Education (photoshop, homepage, etc.), multimedia literacy education	4.10±1.072
	Education necessary for reading classical literature	3.72±1.125
	Cultural education for the understanding of traditional cultural heritage	3.61±1.273
	Tea ceremony and life manners	4.68±.991
Health education	Basic therapeutic skills such as hand acupuncture, foot massage and sport massage	3.51±.536

	Easy first aid and how to treat diseases	3.22±.621
	Calisthenics, how to prevent adult diseases, stretching, etc.	3.39±.633
	Sport dance, Qi exercise, yoga, hypogastric breathing, etc.	3.01±.672
Job skills education	Sign language, special education	3.11±.621
	Oral narration of fairy tales	3.40±.606
	Recreation guidance	3.10±.704
	Music(art) therapy	3.24±.628
	Counseling skills necessary for understanding and conversing with students and parents	3.23±.704
	Education required for obtaining certificates Or licenses	3.28±.672
	Courses for nurturing professional leaders	4.35±.562

3.4. Program importance

As for importance, the item to which the adult learners responded the most in the area of learning environments is that "the center is convenient for transportation and easily accessible". In terms of instructional design, they responded the most to the item "the lecturers have a professional knowledge of or competence in what they teach". In terms of the content and quality of the programs, they responded the most to the item "I have felt a sense of unity or fellowship with my peer learners". In terms of instructional design, they responded the most to the item "step-by-step programs are offered to encourage continuous participation". In terms of the content and quality of the programs, they responded the most to the item "I often attend informal gatherings with the professor in addition to lectures" see <Table4>.

Table 4. Program importance.

	Category(learning environments)	M/SD
1	The chief and teaching staff of the center have a strong belief in lifelong education.	3.59±.782
2	The center puts emphasis on the importance of lifelong education.	3.59±.851
3	The center's staff in charge of lifelong education treat program attendees in a kind and friendly manner with interest.	3.64±.870
4	The center is active in offering instructional support (teaching materials and aids, cooperation from the teaching staff, etc.).	3.64±.842
5	The center considers it important to reflect the educational needs of program attendees in conducting programs.	3.69±.821
6	The center is equipped with educational facilities(books, chairs, audiovisual equipment) that are neatly arranged.	3.66±.887
7	The center is well equipped with amenities including cafeteria, restroom, lounge and parking lot.	3.66±.893
8	The time zone of the center's programs is available to me.	3.63±.861
9	The support from the center for tuition fee and the tuition fee are both appropriate.	3.65±.851
10	The center is convenient for transportation and easily accessible.	3.89±1.666
	Category(instructional design)	
11	The center provides unique programs.	3.50±.776
12	The center's programs are more superior than those of other centers.	3.51±.816
13	Step-by-step programs are offered to encourage continuous participation.	3.49±.834
14	The programs provided by the center come up to the expectations of learners.	3.56±.852
15	The learning objectives of the center's programs are well clarified.	3.63±.864
16	The lecturers have a professional knowledge of or competence in what they teach.	3.77±.839
17	The educational content of the programs is diverse and substantial.	3.62±.911
18	The lecture plans and teaching methods of the professors are good.	3.64±.842
19	The professors of the center give faithful and friendly answers when learners ask questions.	3.68±.866
20	The understanding of learners about what they have learned is well checked, and sufficient additional explanations are given.	3.62±.813
	Category(the content and quality of the programs)	
21	I often attend informal gatherings with the professor in addition to lectures.	3.21±.918
22	When there's something I want to know, I ask the professor for help even if I am not in class.	3.38±.862
23	I ask the professor for help about my personal problems or troubles that are unrelated to his or her lectures.	3.19±.954
24	I often meet my peer learners other than the lecture sessions.	3.38±.848
25	I have a peer learner whom I can pour out my troubles to and ask for help.	3.37±.934

26	When I sign up for a course, I try to find someone who will sign up for the same class.	3.48±.907
27	I have felt a sense of unity or fellowship with my peer learners.	3.56±.869
28	When something I've already known is mentioned in class, I help my peer learners to understand it if they fail to do that.	3.55±.827
29	When there's something I don't understand in class, I ask my peer learners for help.	3.53±.872
30	I frequently get in touch with my peer learners to perform a common task that was assigned in class.	3.51±.896

3.5. Requests for the improvement or supplementation of the lifelong education programs

As for the most necessary improvement in the college lifelong education programs, the subjects mentioned "the way of running the center and programs". The problem with the learning activities of school lifelong education that should be overcome was "lecture-only cramming education". "The reason why they couldn't receive education even though they wanted to do" that was that "they didn't think the education or training would be effective". The condition that the lifelong education center should have to develop and offer competitive quality programs is "good educational facilities." Concerning the evaluation method of school lifelong education, "learner-centered evaluation" was preferred. Concerning required supplementation for the efficiency of lifelong education programs, they considered it necessary to "offer courses from which practical job skills could be acquired". As for the role of college required for the actualization of lifelong learning among local residents, they replied that "lifelong education should be conducted for the fake of local residents". Thus, these things were pointed out as what should be done to improve and supplement lifelong education programssee <Table 5>.

Table 5. Requests for the improvement and supplementation of lifelong education programs.

Characteristics	Category	N (%)	M /SD
1. The most necessary improvement in college lifelong education programs	The quality of educational programs	72 (18.2)	3.52± 1.836
	The qualifications of professors and lecturers including teaching method.	61 (15.4)	
	Educational facilities and equipment	67 (16.9)	
	The way of running the center and programs	75 (18.9)	
	Counseling, materials, information, service, etc.	54 (13.6)	
	How to take advantage of the educational content in society and how to get recognized	43 (10.9)	
	The level of tuition fee	24 (6.1)	
2. The problem with the learning activities of college lifelong education programs that should be overcome	Teacher-centered education	76 (19.2)	2.77± 1.301
	Lecture-only cramming method	114 (28.8)	
	Outcome-centered learning guidance	79 (19.9)	
	Lack of efforts for personal enrichment on the side of learners	79 (19.9)	
	Theory-centered instruction	48 (12.1)	
3. The reason why they couldn't receive education even if they wanted to do that	To enjoy leisure time	58 (14.6)	3.13± 1.491
	I may feel burdened about the expense.	90 (22.7)	
	I don't think the education or training would be effective.	98 (24.7)	
	Childcare and household chores	80 (20.2)	
	I don't like to receive education itself.	35 (8.8)	
	The employer doesn't give me time to receive education.	24 (8.6)	
4. The condition that the lifelong	The principle of benefit assessment should apply.	34 (8.6)	3.20± 1.298
	It should be well equipped with educational facilities.	109 (27.5)	

education center should have to develop and offer competitive quality programs	Excellent lecturers should be prepared.	87 (22.0)	
	Tuition fee or material cost should be inexpensive.	76 (19.2)	
	Programs should be good in content.	90 (22.7)	
5. The evaluation method of school lifelong education	Focusing on educational content	151 (38.1)	1.73± .645
	Learner-centered evaluation	202 (51.0)	
	Teacher-centered evaluation	43 (10.9)	
6. Required supplementation for the efficiency of lifelong education programs	As program attendees are mostly homemakers, programs for young children and childcare facilities are necessary.	52 (13.1)	2.83± 1.161
	Level-based courses should be offered due to individual variances among program attendees.	112 (28.3)	
	The kind of courses from which practical job skills can be acquired should be offered.	123 (31.1)	
	Reasonable tuition fee is a factor to encourage participation.	70 (17.7)	
	The time zone of programs should flexibly be determined.	39(9.8)	
7. The role of college required for the actualization of lifelong learning among local residents	Conducting lifelong education for the sake of local residents.	171 (43.2)	2.00± 1.053
	Opening college amenities and sports ground.	100 (25.3)	
	Making school library available for local residents.	80 (20.2)	
	Opening the computer room and unused classrooms.	44 (11.1)	

4. Discussion

The findings of the study could be discussed as below:

First, as for the general characteristics of the subjects, the women outnumbered the men. It's found that those who were well educated by receiving college or higher education, whose position at work seemed stable as their average age was 45, and who earned a steady income received education at the lifelong education centers. These findings correspond to the finding of Han & Kim[2]'s study that analyzed the changes of the population structure, and also coincides with the finding of Jung[16]'s study that examined problems with lifelong education centers and found a tendency that the learners were mostly from the middle class. To stimulate various people to receive education at a lifelong education center, how to boost the accessibility of lifelong education centers should carefully be studied in consideration of learner characteristics[18].

Second, concerning the needs of the subjects for lifelong education programs, they felt the most need "for the acquisition of new knowledge and skills", "which corresponds with the findings of Park & Lee[10]’s study that made a needs analysis of company employees for lifelong education. Lim Y & An & Kwon[14]'s study and Choi et. al[6]'s study found that the subjects highly asked for "refinement and personal enrichment" and "employment, changing jobs and certificate acquisition". Given these findings, it could be said that adult learners feel strong needs for learning in preparation for the future[19]. As the findings of Jung[20]'s study show, the educational programs that they needed to participate were different from the ones that they actually wanted to do, and they primarily participated in programs that seems to be necessary for social life or household economy than in ones that they preferred.

Regarding desired lifelong education courses, they chose "education on drawing and art-work appreciation" as the courses that they wanted to take the most. In terms of basic cultural educa-

tion, "education on tea ceremony and life manners" was chosen. As to health education, "basic therapeutic skills such as hand acupuncture, foot massage and sport massage" were chosen. Finally, "courses geared toward nurturing professional leaders" was chosen in terms of job skills education. Thus, they chose various programs. Therefore in order to give more options to adult learners, lifelong education centers should offer diverse programs.

Third, concerning program importance, the item to which the subjects responded the most in the area of learning environments is that "the center is convenient for transportation and easily accessible". In instructional design, they responded the most to the item "the lecturers have a professional knowledge of or competence in what they teach". In terms of the content and quality of the programs, they responded the most to the item "I have felt a sense of unity or fellowship with my peer learners". These findings are similar to the findings of Lee[21] and Cho[22] that accessibility to lifelong education centers and interactions with the professor and fellow learners are major factors to determine continuous participation.

Fourth, as to requests for the improvement and supplementation of lifelong education programs, "the way of running the center and programs", "good educational facilities," "learner-centered evaluation", "courses geared toward acquiring practical job skills, and "conducting lifelong education for the sake of local residents" were pointed out. These findings coincide with the finding of Park &Lee[10]'s study that investigated how to step up the vitalization of school lifelong education and found it's important to improve the physical environments of lifelong education centers and to replace existing programs with learner-centered ones. Also, the findings correspond with the findings of Hwang[23]'s study that posed a question about the way that programs were offered without properly reflecting the characteristics and needs of adult learners.

Based on the findings of this study, lifelong education centers should consider what should be done to improve and supplement educational programs so that they could pull their weight by developing a wide range of programs based on the needs and importance awareness of learners and by providing the opportunity for them to acquire professional certification, to find a new job and to take advantage of leisure time.

5. Conclusion and Suggestion

This study is a descriptive research study to determine the educational needs of adult learners in lifelong education centers, their program importance awareness and what improvements and supplementation they asked for. As for the needs of the adult learners for programs, what they participated in lifelong education programs for was analyzed, and they felt the most needs "for the acquisition of new knowledge and skills." Concerning importance, the item to which they responded the most in the area of learning environments is "the center is convenient for transportation and easily accessible". As a result of asking what improvements and supplementation they asked for, "the way of running the center and programs." "good educational facilities," "learner-centered evaluation," "courses geared toward acquiring practical job skills" and "conducting lifelong education for the sake of local residents" were pointed out. Given the findings of the study, lifelong education centers should keep track of the learning needs of learners and reflect them in developing and providing lifelong education programs to satisfy national and social needs and the needs of learners for lifelong learning. Based on the findings of the study, there are some suggestions:

First, it seems important above all for lifelong education centers to keep analyzing the learning needs of learners and reflect them in developing and offering lifelong education programs to satisfy national and social needs and the needs of adult learners for lifelong learning.

Second, in addition to the increase of lifelong education centers in quantity, these centers also should improve in quality by developing a wide variety of specialized and creative programs that can satisfy the learning needs of learners.

Third, as education is conducted throughout one's life, lifelong education centers should provide the opportunity for adult learners to learn new skills and find pleasure in learning itself.

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Lead Author
Shin Hye-sun / Yeoju Institute of Technology Assistant Professor
B.A. Sungshin Women's University
M.A. Hanyang University
Ph.D. Hanyang University

Research field
- Effect of Motion-beat and Rhythm on Health Promoting Behaviors of Obese Women Through Convergence, 15(6) (2017).
- Association Between the Addiction of SNS and Ego-Identity of Youth's in Both Reality and Cyber Space, 15(8) (2017).

Major career
- 2014~2016. Kyungdong University Associate Professor
- 2017~present. Yeoju Institute of Technology, Assistant Professor

Corresponding Author
Park Sun-jung / Yeoju Institute of Technology Assistant Professor
B.A. Yonsei University Wonju College of Medicine
M.A. Hallym University
Ph.D. Samgyuk University

Research field
- Development of Clinical Communication Tools Related to the Death Preparation, Journal of Medical Imaging and Health Informatics, 8(2018).
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Major career
- 2012~2014. Gangneung Youngdong University, Lecturer
- 2015~present. Yeoju Institute of Technology, Assistant Professor