

## The Effect of Empathy and Stress Coping on the Clinical Competence of Dental Hygiene Students

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### ABSTRACT

This study investigated the empathy, stress coping, and clinical competence of the university students in the department of dental hygiene and identified the factors influencing their clinical competence by conducting a self-administered questionnaire survey targeting 3rd and 4th year dental hygiene students in Seoul and Gyeonggi-do regions. As for the statistical analysis of the collected data, the SPSS 21.0 program (IBM SPSS Statistics, New York, USA) was used, and the final 247 copies were analyzed. The average empathy of the subjects was  $3.47 \pm 0.49$  points, the average stress coping was  $3.39 \pm 0.40$  points, and the average clinical competence was  $3.17 \pm 0.51$  points. In terms of the general characteristics, empathy turned out to be high when the clinical practice was satisfactory, and stress coping was highest when the clinical practice period was 2-3 months and when the clinical practice was satisfactory. The clinical competence turned out to be high among those who were satisfied with clinical practice. The subjects' empathy demonstrated a positive correlation with stress coping and clinical competence, while the stress coping demonstrated a positive correlation with the clinical competence. As for the factors affecting the subjects' clinical competence were stress coping, satisfaction with clinical practice, and empathy in their respective order.

Based on the results above, it turned out that the clinical competence increased as the satisfaction with clinical practice, stress coping, and the empathy increased. Hence, teaching and learning strategies and various convergence education programs that can improve the clinical competence of dental hygiene students are needed.

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## 1. Introduction

Recently, as the overall social and economic fields have undergone rapid developments and changes, and as the standard of living has increased, the people's interest in improving the quality of life and oral health has increased, while given many developments in the field of medicine, specialization

and subdivision in the field of oral medicine are underway (Ahn & Song, 2015). Reflective of the needs of the times along with such changes, dental hygienists active in the dental field must have the professional ability to make accurate understanding and judgment in a given situation and solve problems (Jang, 2015). In line with such developments, the field of dental hygiene education is changing into an education that fosters the professional dental hygienists with the skills and competencies to perform the tasks required by society due to changes in the health care environment and various characteristics of subjects, and while fostering them as the dental care manpower equipped with a sense of mission as professionals (Jang, 2015).

Empathy refers to the emotional response to the emotional expression of others, and refers to the ability to understand the thoughts, feelings, and knowledge of others from the perspective of others by distinguishing one's own point of view and the point of view of others (Jeong & Lee, 2015), which renders a significant impact on forming a therapeutic bond with the subject and communicating when performing dental hygiene tasks. The dental hygienists with high empathy provide the patient centric care based on a deep understanding of the patients and can help overcome conflicts in human relationships well (Min & Lee, 2015). In many studies on empathy, empathy is known to be affected by gender, grade, motivation for admission, self-understanding, major satisfaction, clinical practice related satisfaction, interpersonal skills, and clinical competence (Chung, 2013). Furthermore, it was claimed that empathy is the foundation for forming interpersonal relationships, and if empathic understanding is achieved in the interpersonal relationships, it induces altruistic motivation and increases prosocial behavior (Kim & Kim, 2013).

The curriculum of dental hygiene department is consisted of liberal arts, major theory, and practice, and for an effective education, theory classes and practice must be provided and harmoniously combined to increase the students' ability to adapt to the field to ensure that practical education may be achieved in field clinical practice as well as theoretical depth based on the opportunities provided (Chang & Song, 2005; Hong et al., 2009). However, it has been reported that the dental hygiene students perceive stress, such as difficulty due to large amounts of theory classes and clinical practice, and negative emotions such as nervousness and anxiety (Yoo & Kim, 2016). As a process to overcome such stress, stress coping is an act of overcoming stress and protecting individuals from psychological damage through the process of constantly changing cognitive and behavioral efforts, and depending on the type of coping, it may have a positive or negative impact on the stress management. (Lazarus & Folkman, 1984; Yu, 2009). In a study of nursing students, it has been claimed that the students use a lot of problem-oriented coping, and the university students' active stress coping was said to be related to high clinical competence (Yu, 2009). Furthermore, it was claimed that active stress coping improves individual internal resources to respond efficiently to the clinical practice, thereby increasing the satisfaction with daily practice as well as the adaptation to clinical practice, which has a positive effect on the clinical competence (Lee & Hong, 2020).

Clinical competence is an important performance indicator of the dental hygiene education, and is also an important part to evaluate the level of competence as a dental hygienist after graduation (Jang, 2015). To acquire Such clinical competence, the clinical practice education has been conducted in the field of education, while the clinical practice education is a process that integrates and encompasses

all subjects, and changes the students' behavior such as knowledge, skills, and attitude to fulfill the duties and responsibilities of dental hygienists, which in essence is a systematic school education that focuses on fulfilling responsibilities (Jang, 2015). Such various clinical practice educations ought to be made to minimize the gap with the dental field, and various educational courses ought to be provided for the students in the dental hygiene curriculum to produce the dental hygienists with the professional competence required in the field of medicine.

Hence, in order to train the dental hygiene students to grow into the professional dental hygienists, it would be necessary to positively recognize, and they need to be satisfied with clinical practice by leading them to actively participate in clinical practice education (Koo & Im, 2013). In order to lead to a positive response, the dental hygiene students' satisfaction with clinical practice must be increased (Park & Han, 2015), and when the satisfaction with clinical practice is high, the active and responsible learning may be achieved, and the stress related to clinical practice may be reduced.

Examining the previous studies related to the clinical competence (Lee & Hong, 2020; Kwon, 2011; Park & Han, 2015), the higher the level of satisfaction with clinical practice in Lee and Hong's study of nursing students (Lee & Hong, 2020), it was reported that clinical competence was high, and Park and Han's study (Park & Han, 2015) also found that the satisfaction with clinical practice indeed was a factor influencing the clinical competence. Furthermore, even when exposed to the same stressful situation or environment in coping with an uncertain and rapidly changing clinical environment and performing tasks, it was investigated that physical and psychological adaptation were different depending on the individual's stress coping (Park & Jang, 2010). However, examining the studies targeting the dental hygiene students, most of the students' satisfaction with clinical practice and stress factors turned out to be lacking in the studies that identified the factors influencing the clinical competence. Hence, this study aimed to improve the clinical competence of the dental hygiene students by examining empathy, stress coping, and clinical competence, and identifying the factors influencing the clinical competence, targeting third and fourth year dental hygiene students in Seoul and Gyeonggi-do regions toward providing the basic data for planning the specific measures thereto.

## **2. Research Method**

### *2.1 Subjects of the study*

This study was conducted for the convenience and extraction of 3rd and 4th year students enrolled in the Department of Dental Hygiene in Seoul and Gyeonggi-do regions from June 1, 2021 to June 31, 2021, and fully explained the purpose and writing method of the study, and after which, the students who agreed to participate completed a self-administered questionnaire. A total of 250 people were surveyed, and 247 people were included in the final analysis, excluding 3 people with insufficient responses.

## 2.2 Research tools

The research tools used in this study were consisted of a total of 87 questions, including 5 questions for general characteristics, 16 questions for empathy, 24 questions for stress coping, and 42 questions for clinical competence.

As for empathy, the interpersonal reactivity scale developed by Davis (1980) was modified and supplemented by Kim (Kim, 2017). As for the stress coping tool, “The Ways of Coping Checklist” developed by Lazarus & Folkman (1984) was adapted by Kim (1987) and modified and supplemented by Kim (2017) for the university students for a total of 24 questions used. As for the clinical competence, the tool used by Jang (Jang, 2005) modified and supplemented the key questions for job analysis of dental hygienists published by the Korea Health Personnel Licensing Examination Institute, which was modified and supplemented according to this study.

The measurement criteria for empathy and stress coping ability were ‘1 = not at all’, 2 = ‘no’, ‘3 = normal’, ‘4 = yes’, ‘5 = absolutely true’ on a 5-point Likert scale. The measurement criterion for clinical competence was ‘1=very poor’, 2=‘poor’, ‘3=average’, ‘4=good’, and ‘5=very good’ on a 5-point Likert scale, and the higher the score, the higher the empathy, stress coping ability, and clinical competence. The Cronbach's  $\alpha$  was 0.87 for empathy, Cronbach's  $\alpha$  = 0.91 for stress coping, and Cronbach's  $\alpha$  for clinical competence were 0.93, which was a reliable level.

## 2.3 Analytical method

The statistical analysis of the collected data was performed using the SPSS 21.0 program (IBM SPSS Statistics, New York, USA), and the significance level of the statistical test was set at  $\alpha = 0.05$ . The frequency analysis was conducted for the general characteristics of the study subjects, while the independent sample T-test and the one-way ANOVA were conducted to find out empathy, stress coping, and clinical competence, the independent sample T-test and one-way ANOVA were performed, and the Scheffe's post hoc test was used for the statistically significant group. As for the group shown, Scheffe was used as a post hoc test. Pearson's correlation analysis was conducted for the correlation between empathy, stress coping, and clinical competence, and the multiple regression analysis was conducted to find out the factors affecting the clinical competence.

# 3. Research Results

## 3.1 General characteristics of the research subjects

As for the grade year of the subjects, 74.1% of the 3rd years and 25.9% of the 4th years were in the 4th years, and their academic achievement turned out to be low at 20.6%, normal at 43.3%, and high at 36.0%. As for the duration of clinical practice, 41.7% for 1 month, 41.7% for 2-3 months, and 16.6% for 4 months, and satisfaction with clinical practice was 18.2% unsatisfied, 33.6% average, and 48.2% satisfied (Table 1).

**Table 1.** General characteristic of the subjects

Characteristics	Division	N	%
Grade	3rd	183	74.1
	4th	64	25.9
Academic achievement	Low	51	20.6
	Average	107	43.3
	High	89	36.0
Clinical practice period	≤ 1 month	103	41.7
	2-3 month	103	41.7
	≥ 4 month	41	16.6
Clinical practice related satisfaction	Dissatisfied	45	18.2
	Moderate	83	33.6
	Satisfied	119	48.2
Total		247	100.0

### 3.2 Empathy, stress coping, and clinical competence according to the general characteristics

Empathy, stress coping, and clinical competence according to the general characteristics of the subjects are as illustrated in (Table 2). Examining empathy, the overall average turned out to be  $3.47 \pm 0.49$  points, and ‘satisfied’ demonstrated a high score of  $3.47 \pm 0.49$  points for clinical practice related satisfaction, and there was a significant difference between ‘normal’ and ‘satisfied’ ( $p < 0.001$ ). Examining the stress coping, the overall average turned out to be  $3.39 \pm 0.40$  points, and the highest score turned out to be  $3.46 \pm 0.38$  points when the clinical practice period was 2-3 months ( $p < 0.05$ ), which was the highest with  $\pm 0.42$  points ( $p < 0.05$ ). The overall average of clinical competence turned out to be  $3.17 \pm 0.51$  points, and satisfaction with clinical practice turned out to be the highest at  $3.33 \pm 0.53$  points when the response was ‘satisfied’ ( $p < 0.001$ ).

**Table 2.** Career preparation behavior according to general characteristics

Characteristics		Empathy		Stress coping		Clinical competence	
		Mean±SD	p*	Mean±SD	p*	Mean±SD	p*
Grade	3rd	3.48±0.50	0.660	3.38±0.41	0.594	3.15±0.50	0.240
	4th	3.45±0.47		3.41±0.27		3.24±0.51	
Academic achievement	Low	3.43±0.42	0.330	3.36±0.44	0.239	3.10±0.46	0.433
	Average	3.44±0.47		3.35±0.38		3.16±0.51	
	High	3.53±0.54		3.45±0.40		3.22±0.52	
Clinical practice period	≤ 1	3.45±0.57	0.823	3.30±0.44 <sup>a</sup>	0.010	3.07±0.51	0.028
	2-3	3.47±0.41		3.46±0.38 <sup>b</sup>		3.24±0.48	
	≥ 4	3.51±0.47		3.44±0.29 <sup>b</sup>		3.24±0.53	
Clinical practice related satisfaction	Dissatisfied	3.45±0.47 <sup>ab</sup>	<0.001	3.34±0.42 <sup>ab</sup>	0.010	3.03±0.48 <sup>a</sup>	<0.001
	Moderate	3.30±0.38 <sup>a</sup>		3.30±0.33 <sup>a</sup>		3.02±0.40 <sup>a</sup>	
	Satisfied	3.47±0.49 <sup>b</sup>		3.46±0.42 <sup>b</sup>		3.33±0.53 <sup>b</sup>	
Total		3.47±0.49		3.39±0.40		3.17±0.51	

\* by t-test for two groups and one-way ANOVA(post-test Scheffe) for three or more groups

<sup>a,b</sup> The same letter indicates no significant difference by Scheffe test at  $\alpha = 0.05$

### 3.3 Correlation among empathy, stress coping, and clinical competence

The correlation between the subjects' empathy, stress coping, and clinical competence is as illustrated in (Table 3). Empathy demonstrated a positive correlation with stress coping ( $r=0.564$ ,  $p<0.01$ ) and clinical competence ( $r=0.344$ ,  $p<0.01$ ), and stress coping demonstrated a positive correlation with clinical competence ( $r=0.398$ ,  $p<0.01$ ).

**Table 3.** Relationship between self-efficacy, major satisfaction and professionalism

Variables	Empathy	Stress coping	Clinical competence
Empathy	1		
Stress coping	0.564**	1	
Clinical competence	0.344**	0.398**	1

\*\* $p<0.01$ , by Pearson's correlation analysis

### 3.4 Factors affecting the clinical competence of the research subjects

To identify the factors that affect the subjects' clinical competence, the multiple regression analysis was performed with clinical practice related satisfaction, empathy, and stress coping as independent variables and clinical competence as the dependent variable. As a result, stress coping ( $p<0.001$ ), clinical practice related satisfaction ( $p<0.01$ ) and empathy ( $p<0.05$ ) turned out to have significant effects in their respective order (Table 4).

**Table 4.** Factors affecting clinical competence

Variables	B	SE	$\beta$	t	$p^*$
(Constant)	1.107	0.261		4.237	<0.001
Clinical practice related satisfaction	0.138	0.039	0.205	3.558	<0.001
Empathy	0.155	0.071	0.150	2.169	0.031
Stress coping	0.358	0.087	0.283	4.115	<0.001

$R^2=0.220$ , adj  $R^2=0.211$ ,  $F=22.887$ ,  $p<0.001$

\*by multiple regression analysis at  $\alpha =0.05$

## 4. Generalization and design

This study attempted to identify the extent of clinical competence formed through the dental hygiene education targeting the dental hygiene students, and identify the factors influencing the formation of professional clinical competence of students, with the focus on empathy and stress coping, which appear as the factors related to the clinical competence.

Examining empathy, stress coping, and clinical competence according to the general characteristics of the research subjects, it turned out that the overall average of empathy was 3.47 points, and

'satisfied' for clinical practice was high at 3.47 points, and 'normal' and 'satisfied' were high, further demonstrating a significant difference between them. These results were similar to 3.49 points in Lee (2019)'s study of dental hygiene students, and empathy was  $3.43 \pm 0.37$  points in Lee & Hong's (2020) study of nursing students. Empathy is embracing the perspective of putting yourself in the shoes of others, imagining being other people in virtual situations, and having the warmth and interest in others (Davis, 1980), and it is also considered that continuous training such as empathy reinforcement education and clinical case analysis that promotes dental hygiene students, which are essential, are needed.

Examining the subjects' stress coping, it turned out that the overall average was  $3.39 \pm 0.40$  points, and the degree of stress coping was the highest when the clinical practice period was 2-3 months and the satisfaction level of clinical practice was satisfactory. The degree of stress coping was similar to the result of 3.39 points in the study of Lee & Hong (2020) and 3.42 points in the study of Kim (Kim, 2017). Furthermore, the higher the satisfaction with clinical practice, the more positive the stress coping was. Hence, it helps the dental hygiene students to experience positive experiences in the field of clinical practice to ensure that they can flexibly cope with stress and manage it, and it would be necessary to identify the grievances and difficulties experienced by the dental hygiene students at the institution of practice and universities, and make efforts to improve them. Furthermore, it would be necessary to make students aware of the importance of clinical practice as a stepping stone to develop into the professional dental hygienists by applying the theoretical knowledge and skills learned through the curriculum in the field.

The overall average of the subjects' clinical competence turned out to be 3.17 points, and the higher the satisfaction with clinical practice, the higher the clinical competence. These results turned out to be the same as in a study of dental hygiene students by Jang (2015), which claimed that the higher the satisfaction with clinical practice, the higher the clinical competence. Clinical competence may be seen as suggesting that the ability to apply the dental hygiene process may be developed through the continuous clinical practice training process.

Examining the correlation between each variable, empathy demonstrated a positive correlation with stress coping and clinical competence, and the higher the empathy, the higher the stress coping and clinical competence. Furthermore, stress coping demonstrated a positive correlation with clinical competence, and the higher the degree of stress coping, the higher the clinical competence. Such results were similar to the results in multiple studies (Lee & Hong, 2020; Yang, 2015) which claimed that the higher the empathy and the higher the degree of stress coping, the higher the clinical competence. Hence, in order for the dental hygiene students to grow into the dental hygienists with proper clinical competence, it would be necessary to have empathy for basic communication in performing the dental hygiene process for the subject, and that the dental hygiene curriculum is not only technology-oriented, but it is thought that it is necessary to nurture professional dental hygienists who can not only emphasize competence but also improve empathy through various experiences and perform dental hygiene process based on empathy.

As a result of the multiple regression analysis performed with clinical competence as a dependent variable to confirm the factors that affect the subjects' clinical competence, it turned out that the higher the level of stress coping, satisfaction with clinical practice, and empathy, the higher the

clinical competence.

Gathering which, the clinical practice related satisfaction, stress coping, and empathy were identified as factors which improve the clinical competence of the dental hygiene students. Hence, in the field of education, the student guidance and education are needed to improve the clinical competence, and the development of educational programs considering stress coping and empathy is required for improving their abilities. Meanwhile, this study is a result of studying the relationship with clinical competence based on stress coping and empathy variables, while most of the previous studies were conducted with the nursing students, and the studies on dental hygiene students were almost incomplete, and in view of which, it is meaningful that this study was attempted. However, this study has limitations in expanding the interpretation of the research results because some dental hygiene department students were randomly represented, and there may be limitations in classifying and comparing direct variables and mediating variables that affect the clinical competence. Hence, it seems that further studies on the variables affecting clinical competence targeting dental hygiene students ought to be conducted.

## 5. Conclusion

This study is a self-reported survey of the 3rd and 4th year dental hygiene students in Seoul and Gyeonggi-do regions intended to investigate the dental hygiene and empathy, stress coping, and the clinical competence of university students, and identify the factors influencing clinical competence, and as a result of analyzing the final 247 copies, the following conclusions were obtained.

1. The average empathy of the subjects was  $3.47 \pm 0.49$  points, the average stress coping was  $3.39 \pm 0.40$  points, and the average clinical competence was  $3.17 \pm 0.51$  points.

2. According to general characteristics, it turned out that empathy was high when the clinical practice was satisfactory, and stress coping was highest when the clinical practice period was 2-3 months and when the clinical practice was satisfactory ( $p < 0.05$ ). Clinical competence was high among those who were satisfied with clinical practice ( $p < 0.001$ ).

3. The subjects' empathy demonstrated a positive correlation with stress coping and clinical competence, and stress coping demonstrated a positive correlation with clinical competence.

4. The factors affecting the subjects' clinical competence were stress coping, satisfaction with clinical practice, and empathy in their respective order.

Based on the results above, it turned out that the clinical competence increased as the clinical practice related satisfaction, stress coping, and the empathy increased. Hence, teaching and learning strategies and various convergence education programs that can improve the clinical competence of dental hygiene students would be needed.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.



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