A Study on the Change of Clinical Self-Confidence according to the Number of Clinical Dental Hygiene Practices of Students in the Department of Dental Hygiene
- Focusing on scaling practices -

최용금[1] · 김미선[2] · 정수라[3] · 김은정[4*]
선문대학교 건강보건대학 치위생학과 및 유전체 기반 바이오 IT 융합연구소[1] ·
경동대학교 치위생학과[2] · 이화여자대학교 신산업융합대학 융합보건학과[3] · 강동대학교 치위생과[4]

1. Introduction

Clinical dental hygiene is an internationally standardized curriculum in which students in the department of dental hygiene understand the dental hygiene management process and learn evidence-oriented studies[1]. Clinical dental hygiene is also an integrated curriculum that learns practical practices and theories that require expertise related to various clinical areas as dental hygienists such as specialized dental plaque management process, preventive treatment, and comprehensive periodontal care based on understanding patients' health and oral needs[2,3]. In particular, this subject is addressed as a very important part of the Acton Medical Technicians, etc. of Dental Hygiene[4], including the removal of dental calculus or scaling practice, which is directly related to the practical examination of the Dental Hygiene Examination[5]. Therefore, a lot of time is invested in theory and practice education on scaling in clinical dental hygienics curriculum. Looking at Choi's research[6], the theory and practice of probe were operated for an average of 6. 6 hours in clinical dental hygiene education as a subject of practice needed for the operation of hand instrument, or scaling. The theory and practice for the application of hand instrument, such as scaler and curets, were conducted 64. 4hours, while the actual subject practice, including scaling (hand instrument, ultrasonic instrument), was found to be running 100. 4 hours on average. In addition, a total of 34.1 hours of hand instrument practice and evaluation were conducted to prepare for the national test. As such, the importance of scaling practice by operating the periodontal instrument in clinical dental hygiene courses can be seen as a major factor. This is because the scaling proficiency of dental hygienists is stated as the core basic hygiene competency of dental hygienists and is evaluated as the greatest competence of dental hygienists after graduation[7], and is directly related to the elimination of national exams[8]. In addition, an investigation of what is the most skilled practical ability of dental hygienists to perform in dental hygienists' core basic hygiene skills

교신저자: 김은정, (27600) 충북 음성군 감곡면 대학길 278
          강동대학교 치위생과
          Tel: 043-879-3416, Fax: 043-879-3411
          E-mail: kej1007@gangdong.ac.kr

showed that they were definitely capable of performing dental calculus removal using ultrasonic instrument, and that the most important ability of dental hygienists to perform clinical procedures before graduation was performing ultrasonic instrument[7]. Therefore, in the clinical dental hygienic curriculum, it is a very important problem to effectively educate students on dental hygiene and students' actual scaling skills so that they have the skills required in clinical practice. On the other hand, dental hygiene students experience a lot of stress during the scaling practice. The main factors of stress can be summarized as the use of unfamiliar periodontal instrument, the difficulty and burden of removing large quantities of dental calculus due to the operation of in accurate instruments, the discovery of one's lack of knowledge of scaling and the lack of skills, and the professor's assessment of scaling practices[9], which can be reported as a major stress-induced by the overall lack of confidence in scaling. Students experience a great deal of anxiety during scaling practices. Lim and Wu[10] said that students lack their skills and feel more anxious when they are less confident during the scaling practice, so they should be able to provide effective practice strategies to reduce students' anxiety, and that in light of students' psychological difficulties, the professor needs specific teaching design so that students can find the best way to improve their abilities and improve their level of perfection. However, there is still a lack of research on how to effectively educate students in dental hygiene so that they can lower their anxiety about scaling practices and gain confidence in their skills. Therefore, in this study, we would like to measure the changes in students' confidence in scaling according to the number of scaling practices in the clinical dental hygiene curriculum to provide the basic data needed to plan effective teaching design for practical training

on scaling, which is also the most important clinical practice in dental hygiene.

2. Methods

2.1. Study subjects

From August 29 to December 19, 2019, 52 third-year students of the department of dental hygiene at S University in Asan, Chungcheongnam-do were selected as candidates for agreeing to and volunteering for the study during the practice-based clinical dental hygiene curriculum. Among them, a total of 48 people were selected and analyzed, excluding four who did not respond to the survey. Since this paper confirms the changes and demands of face-to-face practice in the repeated practice process of students in the Department of Dental Hygiene in the curriculum of clinical dental hygiene, all the previous semester's hand instrument training was over, and the third grade student who first faced the patient was selected as the subject.

2.2. Study methods

In the department of dental hygiene at S University, clinical dental hygiene and practical IV courses have been opened and operated with four credits in the second semester of the third grade. 52 third-grade students will provide expert clinical dental hygiene treatment courses to improve oral health of participants once a week for four hours, and provide a complex professional dental hygiene management course to communicate for oral health awareness and behavioral changes of participants. Two professors who have drawn up a class plan and shared the direction, goals and guidance courses of the class will supervise a total of 52 subjects, and check the process of the dental hygiene (assessment-judgment-planning-performance-assessment) management process.

By the 15th week, each of the 16~18 students, under the supervision of one professor, made a reservation in advance and conducted a dental hygiene management program led by a dental hygienist, and were required to complete a survey immediately after the dental hygiene management course was completed.

As shown in Figure 1, five survey responses were obtained from students who faced each other five times every two weeks after the first face-to-face scaling practices, excluding orientation, midterm, final exams, two hands-on assistants, and two hands-on practices (Figure 1). For an honest response, the representatives of each division were required to turn over the contents so that they could not see the contents and submit them in batches. This study was conducted after being approved by the Institutional Committee of S University (SM0201904-011-1).
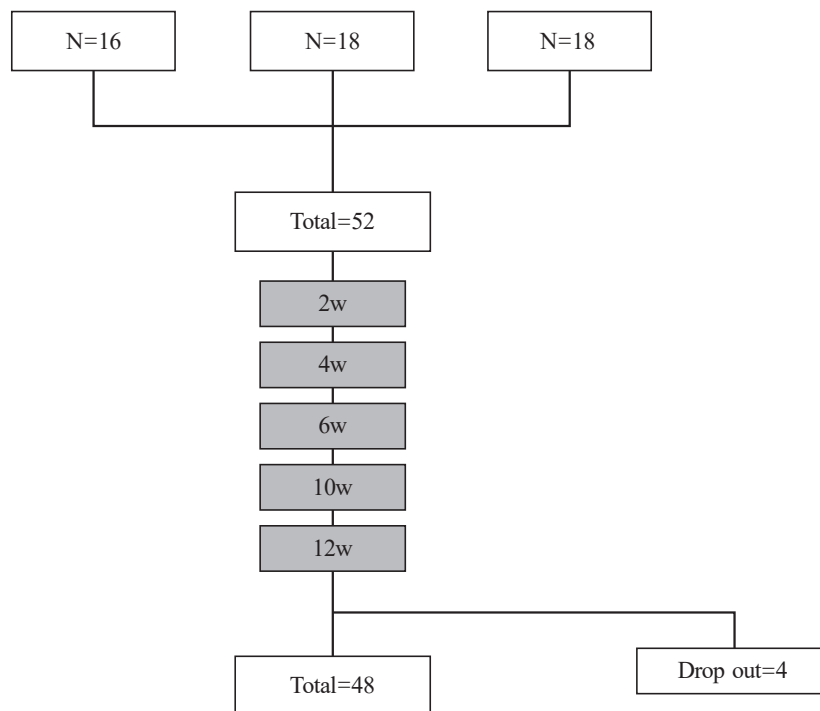

Figure 1. Program flow and research subjects

2.3. Questionnaire structure
2.3.1. Confidence in face-to-face scaling practices

Self-confidence is defined by the unquestioned belief and ability of oneself[11]. It is often used in a similar way to self-efficacy and uses indicators such as confidence, self-efficacy, and anxiety to predict actual academic performance[12,13]. In this study, students' confidence in practice was utilized in the dental hygiene program curriculum. As an item of confidence, each question consisted of a scale of 1 point for "little confidence" and 5 points for "very confidence" in "little confidence" and 5 points for "little confidence" in "larger confidence", and the higher the score, the more confident you are. The above scale was used in the analysis by dividing "little confidence" and "little confidence" and "lack of confidence" into "little confidence" and "lack of confidence" scales.

2.3.2. Confidence in instrument application

In the previous Confidence Study of Dental College graduates, 'Dental Treatment Technique' was adapted as 'Dental Hygiene's Instrument Performance' and evaluated as a sub-item divided into the performance of hand instrument and ultrasonic instrument[14].

2.3.2.1. Confidence with hand instrument

The confidence level of using the hand instrument is asked in the confidence survey of the current subject "the degree of confidence in applying the hand instrument," each question consists of one point for "little confidence" and five points for 'very confidence," and the higher the score, the more confident you are. The above scale was used in the analysis by dividing "little confidence" and "little confidence" and "lack of confidence" into "little confidence" and "lack of confidence" scales.

2.3.2.2. Confidence with ultrasonic instrument

The application of ultrasonic instrument also consisted of a scale of 1 point for 'little confidence' and 5 points for 'very confidence' for 'little confidence' and 5 points for 'little confidence' for 'lots of confidence' in the survey of confidence, and the higher the score, the more confident I am. The above scale was used for analysis by including 'very confident' and 'very confident' and 'very confident' as a measure of 'little confidence' and 'little confidence' and 'lack of confidence' as a measure of 'little confidence' and 'lack of confidence'.

2.4. Statistical Analysis

The general characteristics of the students who participated in the survey and confidence in the application of the patient care, hand instrument, and ultrasonic instrument during the dental hygiene control program were used using the frequency analysis and the chi-square test was used. The difference in self-esteem over the time of the exercise was analyzed and compared with Repeated Measure ANOVA. The collected data were analyzed as SPSS 23.0 (SPSS Inc., Chicago, IL, USA), and the significance level for determining statistical significance was set at 0.05.

3. Results

According to the survey, 93.7% were female and 3% were male. The final response rate was 85.7%. Five students were excluded from the analysis because they did not respond.

Table 1, 43.8% of students said they had little confidence when they first met the participants in the dental hygiene program, and 37.5% said that about 80% of students had no confidence with ordinary confidence. In particular, 50% and 39.6% of the students said they had little or no confidence in hand instrument, respectively. 52.1% and 35.4% said they had little confidence in using ultrasonic instrument. Students showed a similar tendency in the second practice, with 31%, 37.5%, and 37.5%, respectively, responding that they had little confidence in the face-to-face care of the subject, confidence in using hand instrument, and little confidence in the use of ultrasonic instrument. During their third visit, the students also responded that they had little confidence in the face-to-face care of the subject, confidence in using hand instrument, and confidence in using ultrasonic instrument, with 27.1%, 41.7% and 27.1% of the respondents. During their fourth practice, students complained of lack of confidence in facing the target with 31.3%, 31.3% and 25.0%, in using hand instrument and in using ultrasonic instrument. And

during the final practice, students were less confident in facing the target, confidence in using hand instrument 14.6%, 25.0%, and 12.5%, respectively, when meeting the target. Students' lack of confidence was diminishing as they carried out the practice.

Table 2 shows the average of five points on the scale of confidence that students respond to. Face-to-face practice in each car averaged 2.64 in the first practice, with 2.85, 3.00, 2.94, and 3.17 in the second, third, fourth and fifth practice, respectively. In the use of hand instrument, the students had an average confidence of 2.49 in their first practice and 2.66, 2.70, 2.79, 2.98 in the second, third, fourth and fifth practice, respectively. Ultrasonic instrument, like hand instrument, also showed confidence of an average of 2.51 in the first practice and 2.75, 3.00, 2.98 and 3.21 in the second, third, fourth and fifth practice, respectively. As the practices progressed, confidence increased in all categories as expected, which was statistically significant. In particular, from three or more innings, the confidence score increased noticeably, which was a significant result in all categories.

Figures 2, 3 and 4 were compared to examine the distribution and trend of each response according to the timing of the practices. As the practice progressed as shown in Figure 2, students who had a lot of confidence in face-to-face practice were clearly distributed in the fifth practice, and it was confirmed that they were gaining confidence from the third practice. As the practice progressed, the lack of confidence decreased, and the confidence increased slightly. In ultrasonic instrument, confidence also increased, and students who said they were not confident decreased significantly after three practice.

Table 1. Confidence of the Dental Hygiene Students in Entering the Practical Course (N=48)

Variables	1st practice N (%)	2nd practice N (%)	3rd practice N (%)	4th practice N (%)	5th practice N (%)
Responses to Questionnaire (%)	48 (85.7)	48 (85.7)	48 (85.7)	48 (85.7)	47 (83.9)
Gender, n (%)					
male	3 (6.3)	3 (6.3)	3 (6.3)	3 (6.3)	3 (6.4)
female	45 (93.7)	45 (93.7)	45 (93.7)	45 (93.7)	44 (93.6)
Confidence in the practical course, n (%)					
little	21 (43.8)	15 (31.3)	13 (27.1)	15 (31.3)	7 (14.6)
average	18 (37.5)	24 (50.0)	22 (45.8)	22 (45.8)	24 (50.0)
a lot of	9 (18.8)	9 (18.8)	13 (27.1)	11 (22.9)	16 (33.3)
Confidence in hand instrument, n (%)					
little	24 (50.0)	18 (37.5)	20 (41.7)	15 (31.3)	12 (25.0)
average	19 (39.6)	24 (50.0)	20 (41.7)	28 (58.3)	23 (47.9)
a lot of	5 (10.4)	6 (12.5)	8 (16.7)	5 (10.4)	12 (25.0)
Confidence in ultrasonic instrument, n (%)					
little	25 (52.1)	18 (37.5)	13 (27.1)	12 (25.0)	6 (12.5)
average	17 (35.4)	23 (47.9)	22 (45.8)	26 (54.2)	25 (52.1)
a lot of	6 (12.5)	7 (14.6)	13 (27.1)	10 (20.8)	16 (33.3)

Table 2. Confidence of the Dental Hygiene Students in the Practical Course   (N=48)

Participation	Confidence in the practical course			Confidence in hand instrument practice			Confidence in ultrasonic instrument practice		
	Mean	(SE[95% CI])	p*	Mean	(SE[95% CI])	p*	Mean	(SE[95% CI])	p−value*
1st	2.64	(0.13[2.37−2.91])		2.49	(0.11[2.26−2.72])		2.51	(0.12[2.26−2.75])	
2nd	2.85	(0.11[2.63−3.07])		2.66	(0.11[2.44−2.88])		2.75	(0.11[2.53−2.96])	
3rd	3.00	(0.11[2.78−3.22])	<0.001	2.70	(0.11[2.48−2.92])	<0.001	3.00	(0.12[2.75−3.25])	<0.001
4th	2.94	(0.12[2.70−3.18])		2.79	(0.12[2.60−2.97])		2.98	(0.11[2.76−3.20])	
5th	3.17	(0.11[2.96−3.39])		2.98	(0.11[2.75−3.20])		3.21	(0.11[2.99−3.43])	

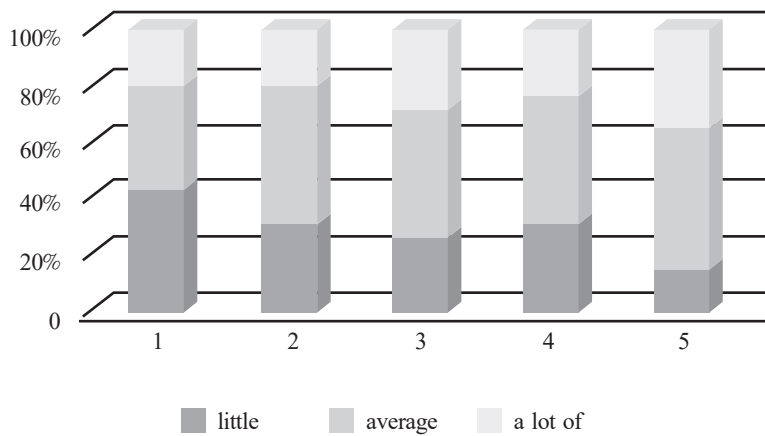* Obtained from Repeated measure ANOVA, based on Greenhouse−Geisser correction.

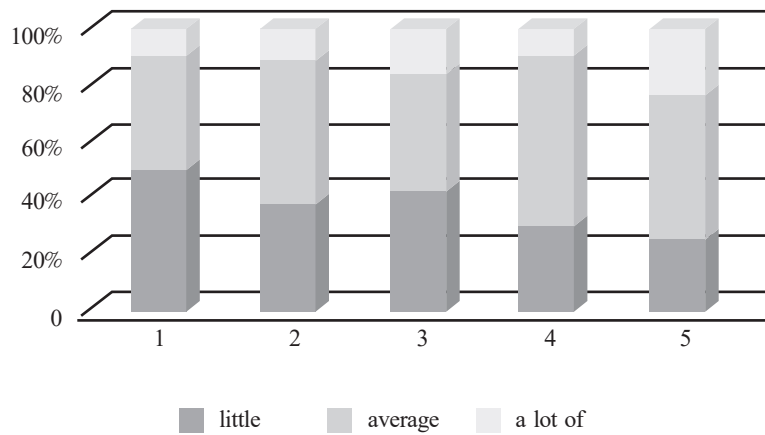**Figure 2.** Graph of the change in students' confidence in each practical course

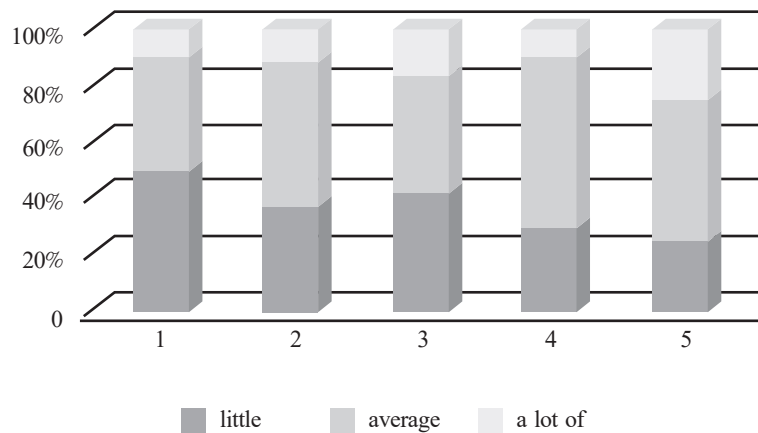**Figure 3.** Graph of the changes in students' confidence in hand instrument practice

Figure 4. raph of the change in students' confidence in ultrasonic instrument practice

4. Discussion

This study was conducted to provide the basic data necessary to plan the effective teaching design of practical training for dental hygienists. White said individual confidence and anxiety are important influences on clinical decision making, and Oneil reported that high anxiety and low confidence in individuals are obstacles to decision-making skills[15,16]. Other Korean studies have also shown that the burden felt by students in the dental hygienics clinical practice curriculum causes serious anxiety and tension[17]. In clinical practice, student anxiety and tension at the point of decision can be a hindrance to decision making. Therefore, students should try to help themselves have a positive experience and improve their confidence.

Most dental hygienists expect clinical practice to improve their clinical skills. There are not many studies of confidence in clinical practice in the department of dental hygiene in Korea, but many have been studied in nursing research. Nursing student's confidence in carrying out patient safety practices was high at an average of 3.85 points out of 5 points[18]. The level of confidence in dental hygiene students of Lee and Kim was slightly higher than that of our study

when conducting practice such as general medical preparation. Similar to our research, however, the confidence in the subject of the practice for a relatively long period of time, such as checking the patient's symptoms after face-to-face, and in the field of self-directed application of the technique, showed a level of confidence similar to that of our research[19]. In our study, students were significantly more confident in both face-to-face, hand instrument and ultrasonic instrument as they repeated the practice, and the previous study, the frequency of the practice, supported the report that the performance confidence and quantity were correlated[20]. Jung's study shows that confidence increases as the practice progresses, and as with our study, the frequency of practice performance was an important factor in improving confidence[21]. Especially in our study, we were able to see more confidence increase than the first practice in more than three times. Therefore, it is considered that repeated practical designs will require at least three designs. Many prior studies have stated that various educational methods such as presentation of clinical scenarios, role play, preceptor-based education programs, simulation training, and utilization of clinical performance programs are effective strategies to reduce the burden

of meeting subjects for the first time and enhance their ability to perform clinical trials by increasing their confidence[22,23,24]. Simulation training reported that the theory learned by the lecture in the classroom was excellent for clinical practices skill[25]. Thus, in the field of dental hygiene, efforts should be made to improve clinical practice skill and confidence by applying various teaching methods.

The significance of this study is that students' confidence was confirmed during repeated practice in dental hygiene practice, which is a part of little research at present. The student's confidence in clinical practice education is an important indicator that must be considered because students' subjective responses to their educational experience can increase motivation to actively participate in their own learning and achieve their learning goals.

Currently, confidence and anxiety measurement tools related to clinical practice are being developed and used in nursing in Korea[26], but there are no measurement tools in dental hygiene. Therefore, based on this study, it is expected that diversity in teaching design methods for increasing students' confidence will be studied by developing accurate measurement indicators of students' confidence and anxiety related to clinical practice in the field of dental hygiene. This study has many limitations. First, it is difficult to generalize because it is a study of students in some areas. Second, confidence measures are not indicators developed by the Department of Dental Hygiene. Third, there is a lack of control over various factors, such as prior learning levels and individual achievement that affect confidence. Nevertheless, the study is the first to observe changes in confidence as the number of dental hygienics students in Korea increases. It is imperative to develop an objective tool that can pre-evaluate students' confidence in clinical decision making and

anxiety through repeated research, and based on this, follow-upresearch will be needed to improve students' confidence and efficiency in performing practical skills and objectively check their educational performance.

ORCID ID

Yong-Keum Choi, https://orcid.org/0000-0002-5537-4208

Su-Ra Jeong, https://orcid.org/0000-0002-7853-8893

Eun-Jeong Kim, https://orcid.org/0000-0002-6316-7807

Mi-Sun Kim, https://orcid.org/0000-0002-3191-9541

References

1. Choi YK, et al. Study on Clinical Dental Hygiene in Korea Based on Analysis of Clinical Dental Hygiene Curriculum of Fones School in the United States. J Dent Hyg Sci 2017; 17(2): 123-133. https://doi.org/10.17135/jdhs.2017.17.2.123

2. Choi YK, et al. A case study on evaluation of team-based learning effectiveness in clinical dental hygiene. J Korean Acad Oral Health 2019;43(1): 33-39. https://doi.org/10.11149/jkaoh.2019.43.1.33

3. Bae SM, et al. Satisfaction and Content Validity of Learner's Satisfaction Using Problem-Based Learning (PBL): Focusing on Dental Hygiene Department and Clinical Dental Hygiene Department. AJMAHS 2019;9(11): 9651-660. https://doi.org/10.35873/ajmahs.2019.9.11.058

4. Choi YR, et al. Dental Hygienists Awareness of Medical Technician Jurisprudence. J Dent Hyg Sci 2016;16(6): 495-501. https://doi.org/10.17135/jdhs.2016.16.6.495

5. Jeong SR, et al. A case study on the development and application of flipped learning based clinical dental hygiene curriculum. J Korean Soc Dent Hyg 2020;20(2): 155-66.
https://doi.org/10.13065/jksdh.20200015

6. Choi YK, et al. Study on Current Curriculum Analysis of Clinical Dental Hygiene for Dental Hygiene Students in Korea. J Dent Hyg Sci 2017;17(6): 523-532.
https://doi.org/10.17135/jdhs.2017.17.6.523

7. Chae SH, et al. Research on dental hygienists' clinical skill proficiency in core dental hygiene competency. J Korean Soc Dent Hyg 2016;16(5): 651-606.
http://dx.doi.org/10.13065/jksdh.2016.16.05.651

8. Nam YO et al. A study on the improvement of the national dental hygienist practical examination. J Korean Soc Dent Hyg 2013;13(2): 201-209.
https://doi.org/10.13065/jksdh.2013.13.2.201

9. Lee HS, Hwang MY. A Study on Causes of Stress Experienced by Students of the Dept. of Dental Hygiene, D Health College Public Health under Practical Training on Scaling. J Dent Hyg Sci 1998;4(2): 15-25.

10. Kim SR, Woo HS. The effect of perfectionism on stress and anxiety during Scaling practice. J Dent Hyg Sci 2009;9(2): 161-167.

11. Pajares F, Johnson M. Confidence and competence in writing: the role of self-efficacy, outcome, expectancy and apprehension. Res Teach Eng 1994.;8: 313-331.
https://www.jstor.org/stable/40171341

12. Bandura A. Social cognitive theory: an agenic cognitive. Asian J. Soc. Psychol. 1999; 2(1): 21-41/
https://doi.org/10.1111/1467-839X.00024

13. Stankov L, et al. Confidence: the best non-cognitive predictor of academic achievement? Educ Psychol. 2014;34(1): 9-28.
https://doi.org/10.1080/01443410.2013.814194

14. Fine P, et al. The impact of confidence on clinical dental practice. Eur J Dent Educ. 2019;23(2): 159-167.
https://doi.org/10.1111/eje.12415

15. White KA. The development and validation of a tool to measure self-confidence and anxiety in nursing students while making clinical decisions. Las Vegas:University of Nevada; 2011:1-291.
https://digitalscholarship.unlv.edu/thesesdissertations/1384

16. ONeill ES, et al. Modelling novice clinical reasoning for a computerized decision support system. J Adv Nurs 2005;49(1):68-77.
https://doi.org/10.1111/j.1365-2648.2004.03265.x

17. Son JL, et al. Relationship between incivility through clinical experience and major satisfaction in dental hygiene students. J Korean Soc Dent Hyg 2016;16(5):701-708.
https://doi.org/10.13065/jksdh.2016.16.05.701

18. Park JH, Park MH. Knowledge, Attitude, and Confidence on Patient Safety of Undergraduate Nursing Students J Korean Acad Soc Nurs Educ 2014;20(1):5-14.
https://doi.org/10.5977/jkasne.2014.20.1.5

19. Lee YA, Kim YS. A Study on the Experience of Clinical Practice and the Performance Confidence. J Dent Hyg Sci 2008;8(4):353-359.

20. Han HH. A Study of Convergence on Frequency of Performance, Self-Confidence, Performance Assessment Scores of Core Nursing Skills of Nursing Students. J Digit Converg 2016;13:355-362.
https://doi.org/10.14400/JDC.2016.14.8.355

21. Jung AH, Moon MY. A Study on the Clinical Competence, Problem solving ability according to Frequency of fundamental nursing skill performance, Confidence of Core fundamental nursing skill performance during Clinical Practice in Nursing Student. AJMAHS 2018;14(8):451-463.
http://dx.doi.org/10.21742/AJMAHS.2018.09.30

22. Noh YG, Lee IS. Effect of Stepwise Communication Education Program using SBAR among Nursing Students: Focusing on Scenarios and Nursing Case-based Role Playing. J Korean Acad Soc Nurs Educ 2018;24(2):115−126.
http://dx.doi.org/10.5977/jkasne.2018.24.2.115

23. Kim HS, et al. Empowerment on Clinical Nursing Skills Core Program. J. Converg. Inf. Technol 2014;12(12):589−599.
https://doi.org/10.14400/JDC.2014.12.12.589

24. Kim YH, Lee YM. Relationship of learning motivation, self−directed learning ability and problem solving process of nursing students after practice evaluation of fundamentals of nursing course using role play. J Korea Acad Industr Coop Soc 2012;13(1):147−155.
https://doi.org/10.5762/KAIS.2012.13.1.147

25. Chae HJ. The needs and effects of convergence−based simulation practice for obstetrical nursing. J Digit Converg 2013;13(9):377−386.
https://doi.org/10.14400/JDC.2015.13.9.377

26. Yu M, et al. Reliability and Validity of Korean Version of Nursing Students' Anxiety and Self−Confidence with Clinical Decision Making Scale. J Korean Acad Nurs 2019;49(4):411−421.
https://doi.org/10.4040/jkan.2019.49.4.411

ABSTRACT

A Study on the Change of Clinical Self-Confidence according to the Number of Clinical Dental Hygiene Practices of Students in the Department of Dental Hygiene
- Focusing on scaling practices -

Yong-Keum Choi[1] · Mi-Sun Kim[2] · Su-Ra Jeong[3] · Eun-Jeong Kim[4*]

[1]Department of Dental Hygiene, College of Health Science and
Genome-based BioIT Convergence Institute, Sun Moon University

[2]Department of Dental hygiene, Kyungdong University

[3]Department of Health Convergence, The Graduate School Ewha Womans University

[4]Department of Dental hygiene, Gangdong University

The purpose of this study was to provide the basic data needed to plan the effective teaching design of scaling education and to measure the changes in students' confidence in performing scaling according to the number of scaling practices. Scaling education is presented as a core basic hygiene competency of dental hygienists and evaluated as the practical competency of dental hygienists. This study selected 48 third-year students from the department of dental hygiene at S University in Asan, and analyzed data from completed participant surveys. The degree of "confidence in facing the subject in clinical practice," "confidence in applying hand instrument to the subject," and "confidence in applying ultrasonic instruments to the subject" was assessed on a five-point Likert scale. The difference in confidence was analyzed during five practice sessions. Each response was compared using frequency analysis, chi-square test, and repeated measurement ANOVA. Students who complained of a lack of confidence in the 14.6%, 25.0%, and 12.5%, respectively, in face-to-face practice, hand instruments, and ultrasonic instrument application responses. The more the practice was repeated, the more confident students were in all three categories, and the more statistically significant ($p < 0.001$). As the number of scaling practice sessions increased, students' confidence in performing scaling also improved. In particular, the level of self-confidence was higher after the third practice session when compared to the first session. Therefore, it is necessary to design effective courses for teaching scaling practices so that at least three repetitive practice periods can be provided in clinical dental hygiene practices.

Keywords: Confidence, Dental scaling, Instrumentation, Oral hygiene, Professional Practice