

Study on the Development of Training Programs for Standardized Patients of the Practical Examination Portion of the National Dental Licensing Examination

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Purpose: The practical examination portion of the National Dental Licensing Examination (NDLE) is slated to be administered in the latter half of 2021 in the form of a clinical performance examination that comprehensively evaluates the patient-dentist interaction using standardized patients (SPs). The SPs should be equipped with the basic qualities and capacity as evaluators for a fair and reliable administration of the test.

Materials and Methods: In this study, we analyzed the existing training materials for SPs who participated in domestic and overseas practical tests for the development of training materials for SPs through seminars and surveys of 11 dentistry schools and colleges.

Result: First, SPs should be selected according to the basic quality criteria and capacity, which they must possess, and the preliminary basic training about the details which they must have knowledge of and be provided through video-recorded cases before the implementation of the preliminary field training. Second, the roles of SPs and the calibration process of the evaluation result forms are needed when conducting the preliminary field training for SPs. After watching video-recorded scenario cases, the SPs participate in discussions about the watched videos before proceeding to calibration practices of evaluation result forms. Third, because the Type A questionnaire of the practical examination of the NDLE is dependent on the SPs' capacity and training, the fairness of the practical test is largely dependent on the SPs. Therefore, practicing the roles as evaluators and evaluation training should be provided using practical test items that can improve the reliability of the test and show a high level of reproducibility about the same case.

Conclusion: The findings of this study will be utilized for the development of training materials for SPs, so they can participate in the administration of a fair and reliable practical examination of the NDLE.

Key Words: Dental education; Dentist; Practical test; Program development; Standardized patient

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Introduction

The practical examination of the National Dental Licensing Examination, slated to be held starting from the latter half of 2021, is divided into two types: Type A is the objective structured clinical examination (OSCE) using standardized patients (SPs) and is the clinical performance examination (CPX) for a comprehensive evaluation of patient-dentist interaction (PDI). The Type A questionnaire of the practical test should show consistent reproducibility to the given situation to ensure the reliable administration of the test. The SP is responsible for evaluating applicants without any bias or prejudice, and to ensure this, the SP should receive sufficient training prior to the test. Thus, the education of SPs must be prioritized to secure the reliability and validity necessary for the practical examination portion of the National Dental Licensing Examination, and to achieve this goal, effective training materials need to be developed. Shin et al.¹⁾ reported that sufficient training should be given to improve the skill level of SPs and to compare the scoring results between evaluators. Kwon et al.²⁾ proposed that evaluation items should be simplified with a focus on performance. Therefore, training is needed to enhance the skills of SPs.

This study aims to develop training materials for SPs applicable to implementation of the Type A questionnaire about the practical examination portion of the National Dental Licensing Examination

that evaluates the PDI, which is designed to assess the dentist applicant's ability to understand the symptoms of patients and sympathize with them recommend the appropriate course of treatment.

Materials and Methods

This study was conducted from April 23, 2019 to February 22, 2020. We analyzed the training materials for SPs of domestic and overseas practical tests with an aim to develop effective training materials for SPs³⁾, and held a seminar for improving the capacity of SPs for the practical examination portion of the National Dental Licensing Examination by inviting experts from 11 dentistry schools and colleges, dental medicine personnel, dentistry education institutions and related organizations around the country, and collected feedback about the appropriateness of the configuration and content of training materials for the SPs for the practical examination portion of the National Dental Licensing Examination (Fig. 1).

Result

The status of the development of training materials for SPs for the practical examination portion of the domestic National Dental Licensing Examination (Supplementary Material 1) and the status of overseas training for SPs (Supplementary Material 2) were presented in the Supplementary Materials.

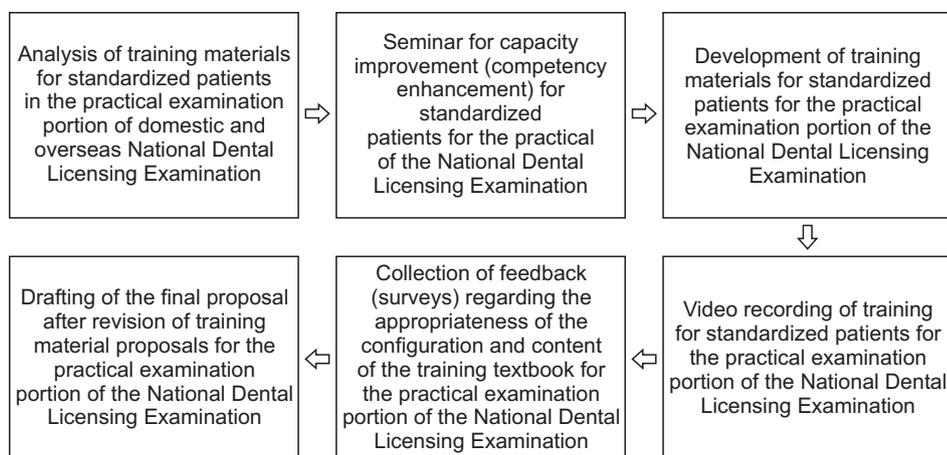


Fig. 1. Study method.

1. Compliance Items of SP

Based on the feedback collected from the seminar (Supplementary Material 3) on the capacity improvement of the SPs for the practical examination portion of the National Dental Licensing Examination (competency improvement), some considerations were drawn, where unexpected situations were minimized in writing scenarios and the patient's medical

backgrounds should be described in greater detail. For quality control of the SPs, repeated training and management of a pool of SPs is critical.

The compliance items for SPs are defined in Table 1.

2. Training Methods and Training Media for SPs

1) Development of training contents

In order to serve as an SP for the practical examina-

Table 1. Compliance items of standardized patients

Topic	Contents
Responsibility for the test	The role of the standardized patient is most important because the practical examination portion of the National Dental Licensing Examination can have an influence on granting licenses. He or she should take pride in and responsibility for participating in the evaluation of dentist applicant.
Security	Maintaining security is very important to ensure the fair administration of the practical examination portion of the National Dental Licensing Examination. The standardized patient must not to leak information about the test in advance. He or she should not reveal to others that he or she is a standardized patient and will participate in the practical examination portion of the National Dental Licensing Examination as evaluators. The scenarios and evaluation checklists must not be leaked to others. If you violate these conditions, you will be held legally liable, so you should perform your role with the highest sense of responsibility.
Appointment time	Education and testing of standardized patients are a promise involving many people. If the appointment time is not observed, confusion will result and this can affect the applicant and disrupt the practical test. If an unexpected situation arises that makes it difficult to meet the appointment time, he or she should inform the Korea Health Personnel Licensing Examination Institute in advance so that there will be no disruption of the test schedule.
Scenario identification	During the test, he or she should play the role of a patient according to the scenario for which he or she has been trained. Comply with the patient's role as it is written in the scenario, and do not add or delete anything apart from what was presented during training. During the test, care must be taken to not have any prejudice when evaluating the applicant and the standardized patient should always act as trained under all circumstances.
Deliver information accurately and consistently	The standardized patient should accurately and consistently convey all the facts in the scenario to the applicant as trained. The standardized patient's answer may vary depending on the applicant's question type. When the applicant asks an open-ended question, the standardized patient should converse a lot, and when asked a question to confirm facts, the standardized patient's answer may be as concise as "yes" or "no." However, the content delivered to the applicant should always be accurate according to the scenario.
Cope with emergencies	The standardized patients do not panic during an awkward silence because the applicant does not ask any questions. Even if silence continues, wait calmly and act as you have been trained. The standardized patients should not induce the applicant to raise questions about the evaluation to break the silence.
Behavior affecting the applicant	The standardized patients should not influence the test applicant with facial expressions or actions that are irrelevant to the scenario.

tion portion of the National Dental Licensing Examination, it is necessary to educate them so they have a basic understanding of the practical test, an understanding of dentistry terms, the concept of SPs and the dentist-patient relationship, and an understanding of evaluators' roles.

In this study, we developed an SP training program for the practical examination portion of the National Dental Licensing Examination based on the analysis, design, development, implementation, and evaluation (ADDIE) model⁴⁾. The contents of the ADDIE model are shown in Table 2.

2) Training method and training media

In order to select an appropriate teaching method for developing SP training materials, the research team held a discussion focused on improving the efficiency and effectiveness of training. Seven factors were identified as necessary to consider when selecting the most effective method for achieving specific training goals⁵⁾.

(1) Objective of training: The objective of the training is to identify what specific area of training the trained learners want to achieve. To be specific, training about knowledge has a different objective compared to training for developing performance skills,

so they use different methods. Therefore, the method of SP training should be determined based on the following objectives: ① to complete the formal training course about the practical examination portion of the National Dental Licensing Examination, ② to understand basic dentistry terms in the process of communication between dentists and patients, ③ to understand scenarios for the role of SPs, and ④ to understand the basic concept of evaluation of practical tests.

(2) Training contents: The connectivity of training contents, the proportion of language in training contents, and the difficulty of training contents can influence the selection of training methods.

(3) Learners' group: Analysis should be done from the learner's perspective, including the size of learners' groups, educational level, prior experience level, aptitude, maturity, reading ability, and speaking ability.

(4) Instructors: The number, quality level and ability of available instructors are also important factors. For example, on-line training methods must be considered in a situation where there are not enough qualified instructors to train all learners.

(5) Training space, facilities, teaching aids and materials: Training space, specific facilities, teaching aids

Table 2. Analysis, design, development, implementation, and evaluation (ADDIE) model

Stage	Role	Detailed design
Analysis	Definition of training contents (What)	Understanding of the practical examination portion of the National Dental Licensing Examination, Understanding of dentistry terms, Concept of dentist-patient relationship, Understanding of evaluators' roles, etc.
Design	Materialization of teaching method (How)	Step 1: Preliminary basic training (on-line video lecture) Step 2: Preliminary field training (on-site) Step 3: On-site field training
Development	Fabrication of training materials (Media)	Phase 1: Fabrication of video-based lecture Phase 2: Development of scenario and preparation for video recording
Implementation	Application to real situation	Phases 1~2: Preliminary training (on-line, on-site) Phase 3: Training on test items (on-site)
Evaluation	Review of appropriateness of training program	Assessment of the reliability of evaluation results

and materials are required for the implementation of all teaching methods. If adequate facilities, teaching aids and materials are not available, alternative methods must be found and implemented.

(6) Training time: The time required to perform a training session can also influence the determination of a training method. For instance, a training method that requires a practical session by learners takes a longer time than an instructor's teaching method.

(7) Costs: The issue of costs is a factor to be considered for training because all the other factors cannot be thought of apart from costs.

In order to achieve the goals of SP training, we decided to conduct blended learning by reviewing the above seven items. The training was implemented in three stages (preliminary basic training, preliminary field training, and on-site field training) through on-line training or field training.

① Preliminary basic training: on-line training

In reference to the curriculum design theory, the preliminary basic training for SPs is conducted on-line through video lectures. Because the preliminary basic training is conducted online, the learner's self-directedness is an important factor in enhancing the training effect. Because learning participation is thought of as a learning effect or as a factor that may have a direct influence on the learning effect, training results have been shown to be closely related to learning effect.

② Preliminary field training: on-line learning and practical sessions

Field training is effective in helping learners who complete the basic training about the practical examination portion of the National Dental Licensing Examination to perform the role of SPs. After observing the video-recorded simulation, field training is conducted to collect feedback about the role of SPs and to discuss problematic situations that might occur during practical tests with the trainees. Because

SPs play the role of evaluators in the second stage of training, sufficient practical training is conducted to secure consistency between evaluators as determined through the collection of feedback from the trainees.

③ On-site field training

Those SPs who have completed the second stage have received training about scenarios used in the practical test. It should be conducted in the form of on-site training on the day of the test to prevent the test content from being leaked. In this study, we suggest that the system of training of SPs for the practical examination portion of the National Dental Licensing Examination should consist of basic training and preliminary field training for SPs. Because the basic training for SPs is conducted using video-recorded cases, this allows each trainee to complete the training at a convenient time and place that is appropriate to their individual circumstances. The preliminary field training for SPs needs to be conducted repeatedly before participation in an evaluation prior to the practical test. Table 3 summarizes the training methods and media for SPs for the practical examination portion of the National Dental Licensing Examination.

3. Collection of Feedback about Training Programs and Materials for SPs of the Practical Examination Portion of the National Dental Licensing Examination

The survey was conducted by distributing questionnaires to all 11 dentistry schools and colleges nationwide to collect experts' feedback on the developed training contents that are to be included in a training program for SPs for the practical examination portion of the National Dental Licensing Examination. One to three training personnel from each dental college, or a total of 27 people, provided their opinions through the questionnaire designed to assess the appropriateness of training methods and

Table 3. Training method and media for standardized patients

Class	Method & media	Training purpose
Preliminary basic training for standardized patient	Video-based training	<ul style="list-style-type: none"> • Understanding of the practical examination portion of the National Dental Licensing Examination • Understanding of basic dentistry • Basic quality as standardized patients • Understanding of PDI concept
Preliminary field training for standardized patients	Lecture & discussion (face-to-face training)	<ul style="list-style-type: none"> • Experiences through watching video-recorded cases • Practice the role as standardized patients • Discussion and practical test for calibration of evaluation result tables as evaluators

PDI: patient-dentist interaction.

the configuration of training materials. The questionnaire consisted of multiple-choice questions and open-ended questions. Due to space constraints, we described the results of only multiple-choice questions in this study.

The overall survey results showed that the contents were appropriate to the system and configuration of training programs for SPs for the practical examination portion of the National Dental Licensing Examination. Among the teaching materials for SPs for the practical examination portion of the National Dental Licensing Examination, the average score of "Outline of the practical examination of the National Dental Licensing Examination" in the first session and "Training on the basic quality of SPs" in the third session had an average of more than four points, indicating that the configuration and contents of training materials were very appropriate. The training system for SPs of the practical examination portion of the National Dental Licensing Examination was evaluated based on "Understanding of dentistry" in the second session, "Understanding of PDI concept" in the fourth session, and the configuration and contents of the training program had average scores of greater than three and half points but less than four points. Additionally, the preliminary field training for SPs of the practical examination portion of the National Dental Licensing Examination consisted of Watching videos in the fifth session, Discussion in

the 6th session, Practical Session I: Role of SPs in the seventh session, and Practice II: Calibration of evaluation result tables in the eighth session. The average score of the training contests was 4.12 points, indicating the configuration and contents of the training materials were very appropriate.

Table 4 shows the results of feedback collected on the appropriateness of the configuration and contents of the training program and materials for the SPs for the practical examination portion of the National Dental Licensing Examination from 11 dental schools and colleges.

4. Development of Training Programs for SPs

1) Training system and contents for SPs

In regard to the training system for SPs, we propose that the trainees who participate in the training for SPs for the practical examination portion of the National Dental Licensing Examination should complete the preliminary basic training and preliminary on-site training provided in videos. Because the trainees have to perform the role of SPs well and to assess PDI as evaluators, we propose that the training should be conducted repeatedly. The training system for the SPs for the practical examination portion of the National Dental Licensing Examination is shown in Fig. 2.

Table 4. The results of the survey on the appropriateness of the configuration and contents of training programs and materials

Training system & stage	Contents	Average
Training system for standardized patients for the practical examination portion of the National Dental Licensing Examination		3.85
Preliminary basic training for standardized patients for the practical examination portion of the National Dental Licensing Examination	1st Session: Understanding of the practical examination portion of the National Dental Licensing Examination	4.00
	2nd Session: Understanding of dentistry	3.54
	3rd Session: Training on the basic qualities of standardized patients	4.19
	4th Session: Understanding of PDI concept	3.89
Preliminary field training for standardized patients for the practical examination portion of the National Dental Licensing Examination	5th Session: Watching videos	4.12
	6th Session: Discussion	
	7th Session: Practical Session I: Role of standardized patients	
	8th session: Practical Session II: Calibration of the results table	

PDI: patient-dentist interaction.

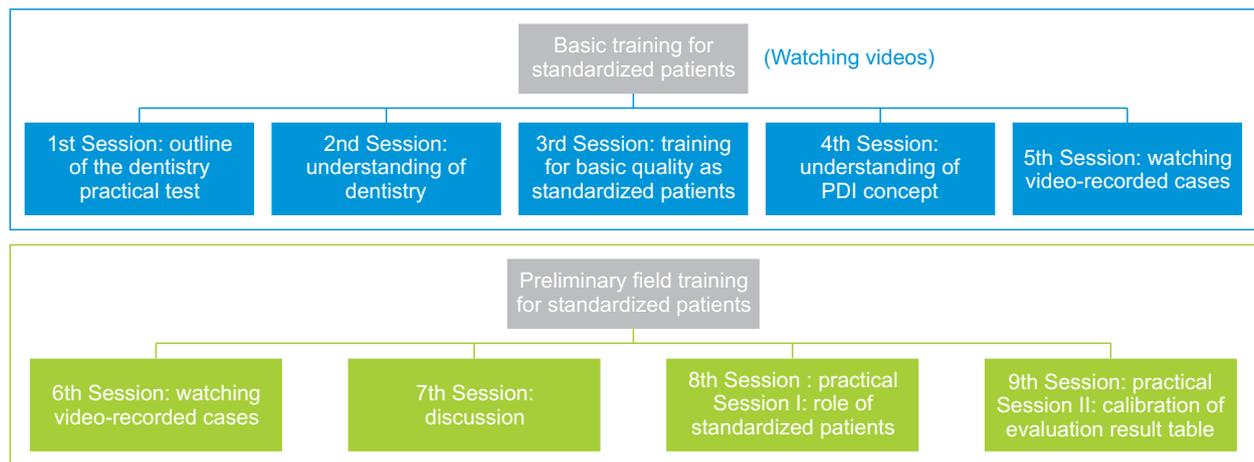


Fig. 2. Training system for standardized patients for the practical examination portion of the National Dental Licensing Examination. PDI: patient-dentist interaction.

(1) Preliminary basic training for SPs

The preliminary basic training for SPs consisted of 5 sessions (Table 5). For each of the first four sessions, the SPs watched a video lecture and answered test questions before moving to the next session.

(2) Preliminary field training for SPs

The on-site training for SPs consisted of a total of 4 sessions (Table 6). In the sixth session, inappropriate situations regarding two senior cases and 12 cases found in case-study videos were created, and the deduction criteria for each case were set up based on the [Patient-Dentist Relation Evaluation Table] used

in the study on Type A survey of the 2018 practical examination portion of the National Dental Licensing Examination. In the seventh session, after watching the case-study videos, they discussed each case. In the eighth session, they personally practiced the role of SPs according to the scenarios. In the ninth session, training about calibration of the evaluation result tables was provided using PowerPoint data, which consisted of the assessment of cases by the SPs and calibration of the evaluation results.

(3) On-site field training for SPs

SPs should have gained full knowledge about the

Table 5. Preliminary basic training for standardized patients

Session No.	Contents	Produced training materials
1	Outline of the practical examination portion of the National Dental Licensing Examination	PowerPoint data, quiz, and videos
2	Understanding of dentistry	PowerPoint data, quiz, and videos
3	Basic qualities training for standardized patients, Basic qualities as evaluators/patients	PowerPoint data, quiz, and videos
4	Understanding of PDI concept	PowerPoint data, quiz, and videos
5	Watching video-recorded cases	Videos

PDI: patient-dentist interaction.

Table 6. Preliminary field training for standardized patients

Session No.	Contents	Produced training materials
6	Watching video-recorded cases 6-1: Case-study Video 1 6-2: Inappropriate matters regarding Case-study Video 1 (cases 1~3) 6-3: Case-study Video 2 6-4: Inappropriate matters regarding Case-study Video 2 (cases 1~9)	Scenario & video
7	Discussion	
8	Practical Session I: Role of standardized patients	Scenario
9	Practical Session II: Calibration of evaluation result table	PowerPoint data

Table 7. On-site field training for standardized patients

Session No.	Contents
10	Scenario training and practical session to be applied to the test

contents of training sessions 1 to 9 of the on-site field training and have completed training and practical sessions about the scenarios to be administered on the day of the practical examination portion of the National Dental Licensing Examination (Table 7).

Discussion

As the study of Shin et al.¹⁾ recommended sufficient training for improving the proficiency of the standardization patient, the SP training program proposed in this study was designed to increase proficiency through incremental step-by-step training and mutual practice among SPs. Kwon et al.²⁾ said that the scoring items should be clarified so that they can be calibrated among SPs. Considering this, field training was planned in sessions 6 and 7.

For this study, we developed training materials which can contribute to improving consistency in their role as evaluators and enhance the reliability of tests in the training of SPs to ensure consistent reproducibility to a given situation prior to their participation in the practical examination portion of the National Dental Licensing Examination, and we reached the following conclusions.

First, those who are selected as SPs must have demonstrated the competencies and understand the criteria required for the practical test, and they will have completed the preliminary field training after the preliminary basic training to acquire the necessary knowledge through videos.

Second, because the calibration of SPs' roles and evaluation result tables is required when conducting their on-site field training, the SPs must practice

their roles and attend practical sessions about how to calibrate evaluation result tables after watching the video-recorded scenario cases and having discussions on the watched videos, so that they can perform their role as evaluators in a reliable way.

Third, because the successful evaluation of Type A questionnaire for the practical examination portion of the National Dental Licensing Examination is heavily dependent on the competency and education of SPs, the fairness of the evaluation of the practical test is determined by the SPs. Therefore, the role practice and evaluation practice must be implemented using items that can improve the reliability of the test to ensure that the SPs demonstrate a high level of consistency about the same scenario case.

Conclusion

To implement the practical examination portion of the National Dental Licensing Examination in a fair and reliable manner, it is of paramount importance that the SPs focus their efforts during the repetitive training sessions on enhancing the capabilities required for being SPs. The educational program proposed in this study is based on the educational program conducted in the practical examination of physicians as well as the prior experience of conducting practical examinations in the United States, Japan, and other countries, so the program is expected to be highly feasible and applicable.

Supplementary Materials

Supplementary materials can be found via <https://doi.org/10.5856/JKDS.2020.13.2.43>.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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