
Short Communication

Influence of General Self-Efficacy on Performance in Practical Pharmacy Training

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Keyword ; self-efficacy, general self-efficacy, pharmaceutical education, practical pharmacy training, summarized assessments.

Abstract ; In practical pharmacy training, summarized assessments using a rubric are employed to accurately assess overall performance and mastery level. One of the determinants of performance is personality. The General Self-Efficacy Scale (GSES) assesses the self-awareness of one's potential to perform the required action. Similar to personality traits, it is thought to influence behavior and motivation across different situations, thereby impacting trainee performance. This study aimed to explore the relationship between GSES and summarized assessment in practical pharmacy training, as well as assess the usefulness of GSES as a possible indicator for improving trainee performance. A correlation analysis between the GSES and summarized assessments of six trainees revealed that, among the three GSES factors, only "fear of failure" correlated with most items in the summarized assessment, showing a significantly positive correlation with the mean overall evaluation score. The summarized assessment indicated a strong relation with "fear of failure." Trainees with low scores in "fear of failure" may be hesitant to engage in practical work due to this fear. Therefore, appropriate guidance and follow-ups are essential for those who experience failure during training. This study will help devise instructional methods that align with the self-efficacy of individual students.

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1. Introduction

In April 2006, the pharmacy education program for trainee pharmacists adopted a six-year system¹⁾. The system was adopted to train quality pharmacists responsible for medical care to meet societal demands, such as the safe use of pharmaceuticals, the advancement of medical technology, and the separation of pharmacy and clinic practices²⁾. To address this social demand, practical clinical skills should be cultivated through a curriculum enriched with liberal arts education, medical pharmacology, and practical pharmacy training at universities²⁾. In the fifth year of the six-year pharmacy education system, long-term

practical pharmacy and hospital training is compulsory. In addition, in the six-year pharmacy education system based on the Revised Model Core Curriculum for Pharmacy Education³⁾ (hereinafter referred to as the "Revised Core Curriculum") adopted in FY2015, the "basic qualities required of a pharmacist" to be acquired by graduation are clearly specified based on the concept of Outcome-Based Education⁴⁾. Therefore, in the evaluation of practical training, accurately assessing mastery level of the "basic qualities required of a pharmacist" is crucial. The supervising pharmacist is required to provide feedback based on this assessment⁵⁾. Practical

pharmacy training based on the Revised Core Curriculum, which began in 2019, uses a rubric-oriented summarized assessment to assess overall performance (skills, behaviors, and attitudes). Few prior studies have considered performance evaluation in practical pharmacy training. Performance evaluation is a good indicator for trainees, enabling them to grow at a practice level.⁶⁻⁸⁾

Performance evaluation is a general term for an assessment method that evaluates the use of knowledge and skills⁹⁾. In performance evaluations, the evaluator focuses on the process and results of the trainee's work on a task. The evaluator assesses how well the trainee can apply his/her knowledge and skills in practice. The determinants of performance include (1) skills and abilities, (2) the demands of the environment and the task, (3) the personality of the trainee, and (4) self-regulation of behavior¹⁰⁾. With regard to personality, practical pharmacy training based on the Revised Core Curriculum is influenced by the practitioner's personality, including individual skills and abilities and personality traits¹¹⁾. Therefore, examining the influence of a trainee's personality on performance is crucial when exploring practical training methods of education.

In a wide range of fields outside of pharmacy education, previous studies have reported that personality indicators, such as personality tests and self-efficacy, influence performance. Toriizuka reported that differences in neurotic tendencies in the Yatabe-Guilford personality test (A psychological test that measures the strengths and weaknesses of 12 dimensions of personality formation) affect sewing

work performance¹²⁾. Oide et al. investigated the relationship between task performance under stress and personality. They conducted a personality test using the Big Five scale (A personality analysis that examines traits and behavioral tendencies based on the highs and lows of five factors). The test results revealed an impact of "cooperativeness," while the performance was not affected by the presence or absence of stress¹³⁾. Furthermore, research has indicated that self-efficacy is related to job performance and career development¹⁴⁾.

In the social learning theory proposed by Bandura¹⁵⁾, the term "self-efficacy" is used to describe an individual's belief in his or her ability to successfully accomplish the actions necessary to achieve a certain outcome¹⁶⁾. In other words, self-efficacy refers to self-perception of the likelihood of being able to perform a required behavior. It is considered a more appropriate predictor of an individual's behavioral change. Furthermore, there are two levels of self-efficacy: task-specific self-efficacy, which influences behavior in a specific task or situation. The other is self-efficacy that has long-term effects on behavior in generalized everyday situations. This encompasses factors that generally define an individual's behavior, such as personality traits, and is referred to as general self-efficacy^{17, 18)}. Bandura stated that knowledge and skills, as well as a high level of self-efficacy, are essential for any action to actually occur. In medical education, educational practices that enhance self-efficacy have been advocated. This is based on the idea that these practices can predict

the performance of medical students and interns¹⁹). Reports have indicated that the higher the general self-efficacy of residents, the greater their training achievement²⁰). Furthermore, self-efficacy and personality tests are evaluated using scales that predict individual behavior. Scales measuring self-efficacy have been shown to predict behavior more effectively than personality tests¹⁷). Thus, research on general self-efficacy has been conducted in medical-related fields, but no studies have yet focused on pharmacy students or pharmacists. General self-efficacy, believed to change behavior and motivation in various settings, may affect the performance of interns during practical pharmacy training.

Accordingly, examining the relationship between trainee characteristics and training outcomes will provide useful information for supervising pharmacists when deciding on a teaching strategy. Therefore, this study aimed to examine the relationship between general self-efficacy and outcomes of practical pharmacy training. It also aimed to explore whether general self-efficacy could be an indicator of better trainee performance in practice instruction provided by supervising pharmacists.

2. Method

2-1. Scope of survey

The scope of the study covered the pharmacy students who completed 11 weeks of undergoing practical pharmacy training at four Soyaku Pharmacy Group stores in Kanagawa Prefecture from May 2019 to November 2019 (Phase II and III of

FY 2019 practical pharmacy training). Of these, the scope of analysis covered data from six individuals who gave their consent and who had no missing responses.

2-2. Questions

(1) General self-efficacy

The General Self-Efficacy Scale (GSES),²¹) developed by Sakano and Tojo, was used to measure general self-efficacy (Table 1). The GSES comprises three factors: behavioral positivity, fear of failure, and social positioning of abilities. There were 16 questions in total: 7 for "behavioral positivity," 5 for "fear of failure," and 4 for "social positioning of abilities." Each question was answered with a two-factor "yes" or "no" response.

(2) Self-assessment of the results of practical training (summarized assessment)

Responses were obtained based on a four-level rubric as an evaluation of the 10 items presented in the "Guide to Practical Training for Pharmaceutical Students" by the Japan Pharmaceutical Association (Table 2). In Stage 1, after confirming the studies in universities, the trainee is able to deal with patients/visitors under the guidance of a supervising pharmacist at a medical site (within about 2-4 weeks from the start of practical training). In Stage 3, the trainee acquires the foundation to work in the medical field as a pharmacist (the stage of basic objectives to be reached during training). In Stage 4, the student is able to achieve the mission aimed for by pharmacists. From lowest to highest, the four stages were given scores from 1 to 4.

Table 1 General Self-Efficacy Scale (GSES) developed by Sakano and Tojo

Behavioral positivity	1. When I do a job, I do it with confidence.
	*5. I tend to worry more than others.
	6. When it comes to making a decision, I decide without hesitation.
	*8. I think I am a shy person.
	10. I am willing to proactively work on tasks even if the outcome is uncertain.
	13. I tend to be proactive with anything.
	*15. I am not good at being proactive.
Fear of failure	*2. I often feel gloomy thinking about past failures and bad experiences.
	*4. I often feel as though I've failed after finishing a job
	*7. When I do something, I often worry that it will not go well.
	*11. I often cannot get started on a task because I do not know how to approach it.
Social positioning of abilities	*14. I tend to be more concerned about small mistakes than most people.
	3. My abilities are superior to those of my friends.
	9. I have a better memory than others.
	12. I have a vastly superior knowledge than my friends about a specific field.
	16. I have the ability to contribute to society.

*Invert scale items

Table 2 Examples of practical pharmacy training with reference to the Japan Pharmaceutical Association Guide (Liaison Conference on Practical Pharmaceutical Training Conducted on February 28, 2018)

Area	Item	Perspective	Evaluation	Description
Fundamentals of Clinical Pharmacy	1	Dignity of Life and the Social Mission and Social Responsibility of Pharmacists	4	With a profound sense of humanity and a deep awareness of the sanctity of life, pharmacists should remain mindful of their social mission and fulfill their responsibilities. They should consistently reflect on their daily operations, pursue self-development to enhance patient care, and provide guidance to younger staff members.
			3	While staying close to patients and the habitants, prioritize their well-being and safety to support the self-determination of patients. Be mindful of the responsibilities expected of pharmacists in healthcare and act with self-discipline.
			2	While being close to patients and habitants, prioritize their well-being and safety. Repeatedly record and reflect on daily learning.
			1	Discuss with sincerity the sanctity of life and the human rights of others. Comply with the duties, laws, and regulations as a pharmacist. Protect the privacy of patients and habitants. Take care of own physical condition as a person engaged in healthcare.
Dispensing Based on Prescriptions	2	Prescription Auditing and Questionnaire Inquiries	4	Determine the appropriateness of the prescription based on the patient's condition and narrative, as well as the scientific rationale for treatment.
			3	Audit prescriptions based on drug and patient information. Share the patient's information with physicians and medical staff (including questionnaire inquiries).

Dispensing Based on Prescriptions	2	Prescription Auditing and Questionnaire Inquiries	2	Perform appropriate audits of all prescriptions and dispensed drugs handled at the training facility based on drug information. Conduct questionnaire inquiries as necessary.
			1	Perform audits of simple prescriptions (*) and dispense medications and implement risk avoidance measures. *(1) Prescriptions that contain only two or three types of drug or (2) prescriptions for a single disease
			4	Always be aware of the significance of pharmacist work. Appropriately prepare, supply, and manage pharmaceutical products without interrupting the work flow, comprehensively considering the patient's needs and pathological conditions.
	3	Dispensing Based on Prescriptions	3	Suggest innovations in dispensing that consider the patient's condition. Quickly and accurately perform counting and measuring for dispensing complex prescriptions in the same way (reproducibly).
			2	Smoothly perform counting and measuring for dispensing all prescriptions handled in the training facility.
			1	Perform counting and measuring for dispensing simple prescriptions (*). *(1) Prescriptions that contain only two or three drugs or (2) prescriptions for a single disease
	4	Patient and Visitor Handling, Medical Instruction, and Patient Education	4	Explain drug therapy in an easy-to-understand manner based on an individual patient's pathology. Identify and analyze issues in treatment and propose countermeasures.
			3	Provide instructions to the patient based on solutions to patient problems. Explain and provide ongoing guidance on changes in prescription medications in response to changes in disease status.
			2	Provide explanations using materials and drug instructions based on collected information on patients and drugs. Provide guidance on the effects, side effects, and special precautions to be taken for typical therapeutic drugs for diseases.
			1	Provide patient care based on the fundamentals of communication. Gather the necessary patient information to provide medication instruction.
	5	Supply and Management of Pharmaceuticals	4	Always be aware of the significance of pharmacist work. Appropriately prepare, supply, and manage pharmaceutical products without interrupting the work flow, comprehensively considering the patient's needs and pathological conditions.
			3	Recognize the significance and purpose of pharmaceutical supply and management operations to appropriately reflect them in practice.
			2	Appropriately supply medicines, including those needed in emergency situations, and properly store narcotics and psychotropic drugs.
			1	Provide and manage basic medical supplies at the practice facility.

Dispensing Based on Prescriptions	6	Safety Management	4	Propose appropriate prescription plans, and so on, from the perspective of medical safety.
			3	Perform a series of audit operations under the sole discretion of the trainee, and so on, in accordance with safety management guidelines.
			2	Work with consideration for medical safety.
			1	Confirm and comply with the basics of medical safety at the training facility.
Pharmacotherapy Practice	7	Understanding Patient Information	4	Identify and analyze therapeutic problems and propose countermeasures to patients.
			3	Identify therapeutic problems based on the past records, current drug information, and information gathered from interviews with the patient.
			2	Provide medication instruction based on the information collected about patients and medications. Share patient information that has been utilized with other pharmacists.
			1	Gather patient information necessary to provide medication instruction. Record the gathered information and the content of the medication instructions in the medication history.
	8	Collection, Evaluation, and Utilization of Drug Information	4	Identify and analyze therapeutic problems and propose countermeasures to patients.
			3	Identify therapeutic problems based on past records, current drug information, and information gathered from interviews with the patient.
			2	Gather information from documents and patients and process it into the information necessary for medication instruction.
			1	Practice gathering and processing information (dosage and administration, efficacy, safety, precautions for use, etc.) on therapeutic agents for typical diseases.
	9	Identification of Problems in Drug Therapy, Prescription Plans and Problem Solving	4	Share monitoring information on therapeutic drugs with prescribing physicians and suggest changes in therapeutic drugs. Analyze the information related to drug therapy and record it to share with other pharmacists.
			3	Accurately identify and analyze drug treatment problems and propose measures to deal with the problems.
			2	Gather information from documents and patients and process it into the information necessary for medication instruction.
			1	Based on the documented information about the drug and the information gathered from the patient, indicate any problems in the patient's treatment.
	10	Effects of Drug Therapy and Adverse Effect Monitoring	4	Provide appropriate measures for dealing with ineffectiveness and adverse drug reactions.
			3	Appropriately conduct ongoing management with respect to the effects of drug therapy, etc.
			2	Evaluate the appropriateness of prescriptions for typical diseases based on evidence.
			1	Attempt the utilization of the gathered information in drug therapy.

In pharmacy practice training, both trainees and supervising pharmacists provide summarized assessments. If the rubric criteria are clearly defined, and if both students and supervising pharmacists fully understand these criteria, their summarized assessments should theoretically be in agreement. Even if discrepancies arise due to differences in perspective, the basic assessment process assumes that students and supervising pharmacists discuss and reach a mutual agreement on the assessment. Based on this premise, the summarized assessment was made using the trainee self-evaluations.

(3) Four factors of self-efficacy

Four information sources have been proposed as factors that increase self-efficacy: "actual achievements and past performance accomplishment," "vicarious experiences," "verbal persuasion," and "emotional evocation"¹⁵⁾. "Actual achievements and past performance accomplishment" refers to the experience of succeeding in what one has attempted. "Vicarious experiences" refers to observing the actions of others. "Verbal persuasion" refers to being encouraged by the words of others. "Emotional evocation" refers to the experience of a change in physiological response. Supplementary explanations were included for the terminology of each information source to facilitate trainee responses. Open descriptions in their responses pertained to what they experienced during their training period.

(4) Self-evaluation of efforts toward practical training (evaluation of efforts)

Responses were obtained on a four-point scale from "1. strongly disagree" to "4. strongly agree" for trainee proactiveness, level of understanding, and preparation and review in practical training.

2-3. Survey methodology

Trainees responded to "(1) general self-efficacy" in the second week of training and to "(3) four factors of self-efficacy" and "(4) evaluation of efforts" in the 11th week of training via an online questionnaire. For "(2) summarized assessment," cooperating Soyaku Pharmacy Group pharmacists downloaded the trainee self-evaluations from the 11th week of practical training from the practical training and guidance management system and sent them electronically to the researchers.

2-4. Analysis method

Since the GSES questionnaire included invert scale items, responses were scored so that higher scores were obtained when self-efficacy was high. According to Sakano et al., self-efficacy is assessed on a 5-point scale from "high" to "low" based on GSES scores^{21,22)}. The GSES 5-point scale includes three types of ratings for students (male and female university students aged 18-21 who are physically and mentally healthy), adult males, and adult females. This study used the GSES 5-point scale for students to classify the three groups.

This study aimed to focus on the impact of low GSES scores on performance to provide suggestions for improving practical training guidance. Therefore, we classified participants into two groups: the low group (0-4 points) and the high group (5-16

points, including "Normal" and above) based on the GSES 5-point scale. Mann-Whitney's U test was used to examine the mean values for each evaluation item. Spearman's rank correlation coefficient was used to examine the relationship between the summarized assessment, the GSES scores and scores for each of the three factors. There are various interpretations of the correlation coefficient $|\rho|$. In this study, $0 < |\rho| \leq 0.2$, $0.2 < |\rho| \leq 0.4$, $0.4 < |\rho| \leq 0.7$, and $0.7 < |\rho| < 1.0$ are interpreted as having almost no correlation, a slight correlation, a strong correlation, and a quite strong correlation, respectively, as in medical and psychological analyses. IBM SPSS Statistics ver. 23 was used for statistical analysis.

2-5. Ethical considerations

This study was approved by the Ethics Committee at Kitasato Institute Hospital (Approval No. 19059). The researchers provided a written explanation of the study content to trainees engaged in practical training at the Soyaku Pharmacy Group. It was also explained that, if they declined to participate in the study after giving their consent to participate, they would be removed from the analysis, and their data would be immediately discarded. We also explained that their responses to the online questionnaire and their summarized assessment of the practical training would not affect their grading of the practical training. In the first part of the online questionnaire in the second week of the practical training, the participating candidates were asked to confirm participation in the study. The respondents

selected (clicked) "I agree" and submitted their responses to the online questionnaire, which was regarded as having given consent.

In this study, anonymous IDs were applied to the survey targets in advance because it was necessary for the responses to questions (1), (3), and (4) of the online questionnaire to correspond to "(2) summarized assessment." The online survey only requested the ID and questions to be filled in. No other personally identifiable information was obtained. The information on "(2) summarized assessment" obtained from the practical training and guidance management system was electronically transmitted to the researchers along with the corresponding ID after deleting the specific information that would allow the cooperating pharmacist to identify the trainee. The researchers conducted the analysis by combining the online questionnaire and "(2) summarized assessment" based on the ID.

3. Results

1) Distribution in GSES 5-point scale

The overall GSES mean score in this study was 4.5 ± 2.81 . The breakdown of GSES scores for the six interns was 1 point (1 person), 3 points (2 persons), 5 points (1 person), 6 points (1 person), and 9 points (1 person), indicating the distribution in the GSES 5-point scale (Fig. 1). The GSES 5-point scale was distributed over a 4-point scale from "Low (0-1)" to "Somewhat high (9-11)."

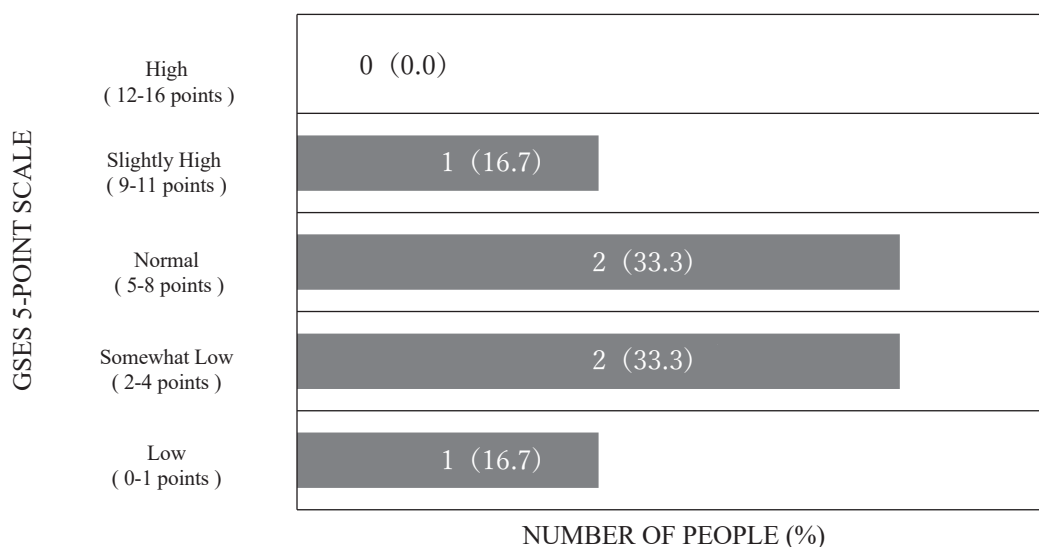


Figure 1 Distribution of trainees in the GSES 5-point scale rating

2) Average of summarized assessment by GSES score

In the GSES 5-point scale, GSES scores were categorized into low (0-4 points) and high (5-16 points) groups. The mean values for each evaluation item are presented (Table 3). No significant differences were observed in the mean value for the summarized assessment of each item by GSES score. Compared with the other items, the greatest difference was found in (6) "safety management," with a mean of 2.67 ± 0.47 for the group with the low GSES scores and 2.00 ± 0 for the group with the high scores.

3) Correlation between GSES and summarized assessment

The correlation between GSES scores, scores for each of the three factors, and the summary evaluation mean are presented (Table 4). The mean scores for each of the three factors were 1.83 ± 1.47 for "behavioral positivity," 1.50 ± 1.38 for "fear of failure," and 1.17 ± 1.60 for "social positioning of abilities." The summarized

assessment items that had a considerable correlation with the three GSES factors (correlation coefficient of $|\rho| > 0.4$) were for behavioral positivity, (3) "dispensing based on prescriptions" ($\rho = -0.548$, $p = 0.260$), and (6) "safety management" ($\rho = -0.420$, $p = 0.407$), both of which had negative correlations. The "fear of failure" section comprised (1) "dignity of life and social mission and social responsibility of pharmacists" ($\rho = 0.615$, $p = 0.193$), (2) "prescription auditing and questionnaire inquiries" ($\rho = 0.652$, $p = 0.161$), (4) "patient and visitor handling, medical instruction, and patient education" ($\rho = 0.652$, $p = 0.161$), (5) "supply and management of pharmaceuticals" ($\rho = 0.696$, $p = 0.124$), (7) "understanding patient information" ($\rho = 0.696$, $p = 0.124$), (8) "collection, evaluation, and utilization of drug information" ($\rho = 0.696$, $p = 0.124$), (9) "identification of problems in drug therapy, prescription plans, and problem solving" ($\rho = 0.652$, $p = 0.161$), and (10) "effects of drug therapy and adverse effect monitoring" ($\rho = 0.652$, $p = 0.161$). The

Table 3 Average summary ratings by GSES score

Final evaluation in week 11	Summary evaluation average \pm standard deviation		P-value*
	GSES; 0 to 4 points (n = 3)	GSES; 5 to 16 points (n = 3)	
Evaluation item 1 (Social mission)	3.00 \pm 0.82	3.00 \pm 0.82	1.00
Evaluation item 2 (Questionnaire inquiries)	2.00 \pm 0.82	2.33 \pm 0.47	0.64
Evaluation item 3 (Pharmaceutical preparation)	3.00 \pm 0.82	2.67 \pm 0.47	0.64
Evaluation item 4 (Patient care and medication instruction)	2.00 \pm 0.82	2.33 \pm 0.47	0.64
Evaluation item 5 (Pharmaceutical supply)	2.67 \pm 1.25	3.00 \pm 0	0.72
Evaluation item 6 (Safety management)	2.67 \pm 0.47	2.00 \pm 0	0.12
Evaluation item 7 (Understanding patient information)	2.00 \pm 0.82	2.00 \pm 0	1.00
Evaluation item 8 (Utilization of drug information)	2.00 \pm 0.82	2.00 \pm 0	1.00
Evaluation item 9 (Formulation design)	2.00 \pm 0.82	1.67 \pm 0.47	0.64
Evaluation item 10 (Monitoring)	2.00 \pm 0.82	1.67 \pm 0.47	0.64
Average for all evaluation items	2.33 \pm 0.78	2.27 \pm 0.25	0.91

*Mann-Whitney U-test

Table 4 Correlation between GSES and trainee summary evaluations

		GSES (Generalized Self-Efficacy Scale)			
		Behavioral positivity	Fear of failure	Social positioning of abilities	Overall
Final evaluation in week 11	Maximum score (points)	7	5	4	16
	Mean \pm standard deviation	1.83 \pm 1.47	1.50 \pm 1.38	1.17 \pm 1.60	4.50 \pm 2.81
Evaluation item 1 (Social mission)	3.00 \pm 0.89	0.121 (p = 0.819)	0.615 (p = 0.193)	-0.508 (p = 0.304)	0.061 (p = 0.909)
Evaluation item 2 (Questionnaire inquiries)	2.17 \pm 0.75	-0.219 (p = 0.676)	0.652 (p = 0.161)	-0.557 (p = 0.250)	0.047 (p = 0.930)
Evaluation item 3 (Pharmaceutical preparation)	2.83 \pm 0.75	-0.548 (p = 0.260)	0.254 (p = 0.627)	-0.197 (p = 0.709)	-0.125 (p = 0.813)
Evaluation item 4 (Patient care and medication instruction)	2.16 \pm 0.75	-0.031 (p = 0.953)	0.652 (p = 0.161)	-0.295 (p = 0.570)	0.235 (p = 0.654)
Evaluation item 5 (Pharmaceutical supply)	2.83 \pm 0.98	-0.257 (p = 0.623)	0.696 (p = 0.124)	0.00 (p = 1.00)	0.257 (p = 0.623)
Evaluation item 6 (Safety management)	2.33 \pm 0.52	-0.420 (p = 0.407)	0.00 (p = 1.00)	-0.220 (p = 0.675)	-0.420 (p = 0.407)
Evaluation item 7 (Understanding patient information)	2.00 \pm 0.63	-0.257 (p = 0.623)	0.696 (p = 0.124)	0.00 (p = 1.00)	0.257 (p = 0.623)
Evaluation item 8 (Utilization of drug information)	2.00 \pm 0.63	-0.257 (p = 0.623)	0.696 (p = 0.124)	0.00 (p = 1.00)	0.257 (p = 0.623)
Evaluation item 9 (Formulation design)	1.83 \pm 0.75	0.00 (p = 1.00)	0.652 (p = 0.161)	-0.361 (p = 0.482)	0.031 (p = 0.953)
Evaluation item 10 (Monitoring)	1.83 \pm 0.75	0.00 (p = 1.00)	0.652 (p = 0.161)	-0.361 (p = 0.482)	0.031 (p = 0.953)
Average for all evaluation items	2.30 \pm 0.81	-0.058 (p = 0.913)	0.559 (p = 0.249)	-0.395 (p = 0.439)	0.029 (p = 0.957)

*Spearman's rank correlation coefficient (p-value)

mean of the overall assessment item was ($\rho = 0.559$, $p = 0.249$). All were positively correlated. In the "social positioning of abilities," (1) "dignity of life and social mission and social responsibility of pharmacists" ($\rho = -0.508$, $p = 0.304$) and (2) "prescription auditing and questionnaire inquiries" ($\rho = -0.557$, $p = 0.250$) were negatively correlated. However, no significant correlation coefficients were obtained in either case.

4) Four factors of self-efficacy experienced in practical training

The four sources of information involved in the self-efficacy experienced by the trainees during their training are shown here (Table 5). Of the four sources of information, "achievement experience and accomplishment of actions to be carried out" described experiences related to communication with patients. "Vicarious experience" described experiences of observing pharmacists in action during medication instruction. "Verbal persuasion" described experiences of being praised by pharmacists and patients. "Emotional evocation" described experiences related to medication preparation, inquiries, and medication instruction.

5) Evaluation of activities

In a 4-point questionnaire on the activities during the last week of training, the mean \pm standard deviation for the group with low GSES scores was 3.76 ± 0.58 for proactivity, 3.33 ± 0.58 for understanding, 3.33 ± 0.58 for preparation and review, and 3.76 ± 0.58 for satisfaction. The mean \pm standard deviations for the

high groups were 3.67 ± 0.58 for proactivity, 3.00 ± 0.0 for understanding, 3.00 ± 0.0 for preparation and review, and 3.67 ± 0.58 for satisfaction, which were not significantly different (Table 6).

5. Discussion

This study examined the correlation between GSES scores and summarized assessment to investigate the relationship between general self-efficacy and performance in practical pharmacy training. Scales to measure general self-efficacy include the "General Self-Efficacy Scale (GSES)"²¹⁾ developed by Sakano and Tojo, as well as the "Generalized Self-Efficacy Scale"²³⁾ by Schwarzer R, and Jeusalem J. An assessment of the validity of general self-efficacy in 25 countries reported possible differences due to cultural backgrounds²⁴⁾. Therefore, this study decided to use the GSES developed by Sakano et al.. This scale has previously been used in studies with Japanese students and workers and nurses. In the three categories (student, adult male, and adult female), the GSES 5-point scale by Sakano et al. is influenced by the frequency of opportunities to engage in social and public activities in daily life²²⁾. Therefore, the trainees in this study were classified using the GSES 5-point scale based on the idea that the trainees have a background of life experience in a "university," a "protected" environment. The overall GSES mean was lower than the mean of the students used to create the GSES 5-point scale (6.58 ± 3.37)²²⁾ and the mean of the nursing students (junior college, 3rd year) (5.4 ± 2.94).²⁵⁾ This is attributable to the

Table 5 Four sources of information that affect trainees' sense of self-efficacy

GSES	Actual achievements and past performance accomplishment	Vicarious experiences	Verbal persuasion	Emotional evocation
Low-score group	<ul style="list-style-type: none"> ● Appropriately answered patient questions during medication instruction. 	<ul style="list-style-type: none"> ● Observed the pharmacist instructor providing accurate answers to patient questions. ● Observed pharmacist instructors smoothly obtaining patients' living conditions and other information by questioning during medication instruction. 	<ul style="list-style-type: none"> ● Praised by the pharmacist supervisors when successfully administering medication. ● My pharmacist supervisor told me that I had grown accustomed to it since the beginning. 	<ul style="list-style-type: none"> ● Through many failures and reflections, medication instruction gradually became a smoother process. ● Comfortable with and capable of smoothly administering prescriptions that had been performed multiple times.
High-score group	<ul style="list-style-type: none"> ● Answered appropriately when the patient asked if he could take the powder after mixing it. I was able to explain that the dose should be taken as soon as the patient gets home and to have an interval of XX hours before the next dose, etc. ● I was able to adequately answer the patient's first questions regarding medication prescribed for the first time. 	<ul style="list-style-type: none"> ● Observed the pharmacist checking the drug history, listening to the patient, and preventing and avoiding adverse drug reactions by making inquiries to the physician regarding prescriptions. ● In the explanation about how to mix the powder for children, I observed the explanations on what can be mixed, what to do if the child doesn't like the taste, such as using a hot water to make round cake-like food, or drinking the powder mixed together with a cold drink. ● The pharmacist's advice was accurate. 	<ul style="list-style-type: none"> ● When giving medication instructions to patients, I was told, "Thank you. It was easy to understand. Please keep at it!" ● I was praised when using own initiative to take action. 	<ul style="list-style-type: none"> ● Felt relatively comfortable with the actual performance after a lot of practice in administering suppositories. ● Made three inquiries. Despite being nervous at first, capable of smoothly making inquiries from the second time. ● Allowed to perform dispensing and learned to dispense more smoothly and accurately than before.

Each of the four sources of information was presented with the following additional explanations. Actual achievements and past performance accomplishment: Did you experience accomplishment/success in anything during the training? Vicarious experiences: Did you observe someone other than yourself achieving or succeeding during the training? Verbal persuasion: Did you have any experiences during your training in which you felt recognized for your own behavior or humanity by someone other than yourself? Emotional evocation: Did you experience a sense of relaxation or confidence when you performed a certain action during the training?

Table 6 Evaluation of the trainee activities

Evaluation of the trainees' own activities	Activity rating mean \pm standard deviation		P-value*
	GSES; 0 to 4 points (n = 3)	GSES; 5 to 16 points (n = 3)	
[Motivation] Were you actively involved in this training?	3.67 \pm 0.58	3.67 \pm 0.58	1.00
[Understanding] Did you fully understand what you learned in this training?	3.33 \pm 0.58	3.00 \pm 0.0	0.42
[Preparation/Review] Did you engage in training after carefully conducting preparation and review?	3.33 \pm 0.58	3.00 \pm 0.0	0.42
[Satisfaction] Was the training satisfactory overall?	3.67 \pm 0.58	3.67 \pm 0.58	1.00

*Mann-Whitney U-test

low frequency of opportunities for pharmacy students to engage in social and external activities in their daily lives²²⁾. Because of their busy schedules for lectures and training, pharmacy students reported fewer opportunities to engage in social and external activities in comparison with students of other faculties and non-six-year medical schools²⁶⁾. This may have resulted in a lower GSES score compared with the students used to create the GSES 5-point scale.

Since this study involved a small number of survey participants and no significant correlations were found, its results cannot be applied to all trainees. However, we believe that knowing the trends in the relationships between the scores of the three GSES factors (behavioral positivity, fear of failure, and social positioning of abilities) and the summarized assessment may prove useful for educators involved in practical training. The following discussion focuses on correlations between items with a significant correlation ($|\rho| > 0.4$).

The items that significantly correlated with "behavioral positivity" were (3) "dispensing based on prescriptions" and (6)

"safety management," both of which were negatively correlated. If "behavioral positivity" is low, while it may mean that they are not confident in their actions and are reluctant to take action, it is also possible that they tend to think carefully about everything they do and plan for the future before they take action. In the summarized assessment (3), "dispensing based on prescriptions," preparing based on comprehensive judgment while recognizing the significance of pharmacist services (Table 2) contributes to high scores; similarly, in item (6), "safety management," understanding safety management guidelines and having a perspective on medical safety (Table 2) leads to high scores. Therefore, trainees were considered able to perform prudent risk management even if their GSES score for "behavioral positivity" was low.

Items with a significant correlation to "fear of failure" were (1) "social mission and responsibility of pharmacists," (2) "prescription auditing and questionnaire inquiries," (4) "patient care and medication instruction," (5) "supply and management of drugs," (7) "understanding patient

information," (8) "use of drug information," (9) "prescription planning," and (10) "effects of drug therapy and adverse effect monitoring," all of which had a positive correlation. On the GSES, all of the "fear of failure" question items were invert scale items, and the higher the number of "No" responses, the higher was the GSES. In other words, a low score on "fear of failure" indicates an increased fear of failure and a negative feeling of being held back by past failure experiences. A high score indicates a tendency to work without being held back by past failure experiences. In the summarized assessment (1), "social mission and responsibility of pharmacists" relates to acting with an awareness of the social mission of pharmacists (Table 2). In (2) "prescription auditing and questionnaire inquiries," (4) "patient care and medication instruction," and (5) "supply and management of drugs," which are included in the field of "dispensing based on prescriptions," involve working with a general consideration for patient preferences and pathology (Table 2). In contrast, (7) "understanding patient information," (8) "use of drug information," (9) "prescription planning," and (10) "effects of drug therapy and adverse effect monitoring," which are included in the field of the practice of drug therapy, involve understanding issues in medication therapy and striving to resolve those issues (Table 2), all of which are related to higher scores. Therefore, if the trainee has a GSES high score for "fear of failure," they should be able to tackle challenging situations through trial and error.

The items that significantly correlated

with "social positioning of abilities" were (1) social mission and responsibilities of pharmacists, and (2) prescription auditing and questionnaire inquiries, both of which were negatively correlated. Based on the questions in Table 1, trainees were considered negative about their abilities if the "social positioning of abilities" was low. However, since Japanese people tend to positively perceive self-deprecating people who take the opinions and social situations of others into consideration when deciding their actions as being modest and humble, as reported by Hosokoshi et al., such people tend to maintain good interpersonal relationships²⁷⁾. This suggests that, even if the trainee has a low score for "social positioning of abilities," they were perceived as humble by patients, supervising pharmacists, and others, resulting in good relationships with them. Establishing good relationships with patients is an important factor in summarized assessment (1) "social mission and responsibilities of pharmacists" (Table 2) and (2) "prescription auditing and questionnaire inquiries" (Table 2). Therefore, even if a trainee has a low GSES score for "social positioning of abilities," the trainee can establish positive relationships with others.

Of the three GSES factors, only "fear of failure" positively and significantly correlated with the overall evaluation mean score. Since there is a correlation with most of the items in the summarized assessment, the implication is that the summarized assessment of practical pharmacy training may be more strongly related to "fear of failure" than the other factors. The results of a study examining the relationship

between anxiety in nursing practice and practical performance also stated that students with low anxiety as a personality trait immediately before practice had higher grades^{28, 29}). It has been reported that, since some students with high anxiety have a stronger "fear of failure" than "desire to succeed," their motivation decreases when confronted with the possibility of failure. Therefore, giving them success feedback leads to better performance²⁸). Since trainees with low GSES scores for "fear of failure" may be reluctant to engage in practical fieldwork due to a fear of failure, appropriate guidance and follow-ups are necessary when trainees make mistakes during training.

Bandura proposed four sources of information as elements that generate self-efficacy¹⁵). In this study, trainees engaged with four sources of information, which may have created a sense of self-efficacy during the training period. Communication with patients was often brought up in the "actual achievements and past performance accomplishment" section. This is consistent with the results of a study³⁰) that investigated successful practical pharmacy training experiences, wherein respondents tended to mention patients more than healthcare providers. As for "vicarious experiences," observation of the pharmacists' actions at work was often mentioned. It was thought that, even if the trainees could not practice the skills themselves, providing many opportunities to observe would help improve their self-efficacy. Since it has been reported that vicarious experiences of the success of the model professional that the trainee aspires

to become in clinical practice are a factor that enhances self-efficacy^{31, 32}), it was thought that the words and actions of the pharmacist would be important in practical pharmacy training. In "verbal persuasion," trainees cited positive and supportive words from pharmacists and patients, which gave them courage and confidence. In "emotional evocation," the respondents cited what they had experienced in the primary duties of a pharmacist. These included dispensing, inquiries, and medication instruction, and they believed that repeated experiences lifted their spirits and gave them confidence.

Of the four sources, Bandura noted that self-efficacy, which is informed by "actual achievements and past performance accomplishment," is the most important, most stable, and long-lasting¹⁵). One way to have a more successful experience in general is the small-step method, in which goals are divided into smaller pieces³³). It was thought that the self-efficacy of trainees could be maintained using a similar approach in practical pharmacy training through participatory training that gives trainees a sense of accomplishment in what they have accomplished. In addition, in practical pharmacy training, trainees have "vicarious experiences" by observing the behavior of the lead pharmacist. They get a real sense of "actual achievements and past performance accomplishment" and "emotional evocation" through practice and further experience "verbal persuasion" through feedback. Since an environment that combines multiple sources of information and experiences has the potential to enhance self-efficacy, the

practical pharmacy training experience may be improved by investigating a variety of experiences during training.

Although the GSES scores of the trainees in this study were high in some cases and low in others, no difference was observed in satisfaction. In terms of how GSES scores affect the sense of learning during practical training, this led us to believe that the trainees were actively engaged and gained an understanding, regardless of their GSES scores in pharmacy practical training. It has been reported that high trainee satisfaction requires highly motivated supervising pharmacists³⁴⁾. It seems that the training environment and appropriate guidance are also necessary for better trainee performance.

Because of the small number of people surveyed in this study, it is difficult to generalize these results to all trainees. Since the results covered multiple stores within the same corporate group, to some extent, the content of the practical training was generalized. Therefore, the impact of differences in the details of pharmaceutical practice could not be considered. In addition, the impact of differences in the daily routines of trainees on GSES scores, as well as the impact of changes in GSES scores during training on the summarized assessment, were not considered. It has been reported that GSES scores are not expected to change after 3 weeks of clinical practice³⁵⁾. In this study, self-efficacy from the second week of practice was used, since no change can be expected across the 11-week practice period. However, it is undeniable that GSES scores may fluctuate if the trainees gain vast experience in the

four sources of information that contribute to self-efficacy during the training period. In the future, we would like to increase the number of people surveyed and examine the relationship between GSES scores and summarized assessments.

The results suggest that "fear of failure" in GSES may affect trainee performance in practical training, which involves applying knowledge. To elicit better trainee performance, we will continue to examine the relationship between GSES and trainee skills and behaviors. We consider whether this could be one of the indicators for providing practical training guidance tailored to the qualities of individual students.

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薬局実務実習におけるパフォーマンスに対する 一般性自己効力感の影響

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要旨：薬学実務実習では、習得度を適正に評価するためにルーブリックを意識した概略評価を用いて、総合的なパフォーマンスを評価している。パフォーマンスの決定要因の一つとして人格特性が挙げられる。一般性自己効力感(GSES)は、必要な行動を遂行できる可能性の自己認知であり、人格特性のように、個人の様々な場面の行動や意欲に変化を及ぼすとされるため、実習生のパフォーマンスにも影響し得る。本研究は、薬局実務実習におけるGSESと概略評価の関係性を検討し、GSESが学生のよりよいパフォーマンスを引き出すための指標に成り得るか有用性を検証することを目的とした。実習生6名のGSESと概略評価を相関分析したところ、GSESの3因子のうち「失敗に対する不安」のみが、概略評価のほとんどの項目と相関があり、全体評価項目平均とかなり正の相関があった。概略評価は、「失敗に対する不安」との関連性が強い可能性が示唆された。「失敗に対する不安」の得点が低い実習生は、失敗を恐れて実践現場での取り組みが消極的になる可能性があるため、実習生が実習中に失敗した際は適切な指導とフォローが必要であると考えた。本研究は、学生個々の自己効力感に合わせた指導方法を工夫するための一助となることが期待される。

キーワード：自己効力感、一般性自己効力感、薬学教育、薬局実務実習、概略評価