






Residents' learning and behavior about tool-guided clinical assessment of social determinants of health

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Abstract

Background: The specific dimensions of learners that have been impacted by educational programs related to social determinants of health (SDoH) remain unknown. This study aims to elucidate how learners are affected by postgraduate education (a single 90-min educational session) regarding tool-guided clinical assessment of patients' social backgrounds.

Methods: A pretest-posttest design was utilized in which residents (postgraduate year (PGY) 1 or 2) and fellows in family medicine (PGY over 3) were recruited. Likert-type questions were developed based on previous qualitative findings. Participants answered these questions before, immediately after, and 1.5 months after the educational session on tool-guided clinical SDoH assessment. Paired-sample *t*-tests were used, and effect size was measured using Cohen's *d*.

Results: A total of 114 residents and fellows participated. After the session, participants expressed more interest in knowing their patients' social backgrounds when considering how to address their patients and were more open to embracing a pre-established assessment framework. Participants also considered clinical skills related to SDoH as learnable and improved their attitude toward patients. They reported that they did not perform specific interventions related to SDoH within 1.5 months after the session. Unlike previous qualitative findings, their concern about the implementation of SDoH-related practices did not increase significantly.

Conclusion: An educational session on tool-guided SDoH assessment may have a positive impact on learners' attitudes related to addressing patients' social backgrounds without fostering concerns.

KEYWORDS

medical education, postgraduate education, social determinants of health, social vital signs

1 | INTRODUCTION

The significance of postgraduate education concerning the social determinants of health (SDoH) has gathered recognition.¹ This acknowledgment is rooted in the contemporary call for clinicians to actively address and engage with SDoH,^{2,3} a call that, unfortunately, has not been sufficiently championed in clinical settings.^{4,5} Postgraduate education initiatives focused on SDoH have the potential to yield favorable learner-reported outcomes, including increased confidence, improved screening for SDoH, greater acceptance of training for marginalized populations, and a heightened propensity to make referrals to support services.⁶

To effectively integrate the perspective of SDoH into clinical practice, a number of tool-guided approaches have been published to address patient-related SDoH,⁷ demonstrating their effectiveness in collecting patient data and improving physician-reported outcomes.^{8,9} Encouraging medical professionals to screen and address patients' social needs must be coupled with educational efforts regarding professionalism and underlying health inequities.¹⁰ However, how trainees perceive the process of learning about SDoH assessment tools and implementing tool-guided care is still ambiguous.

To address these gaps, a comprehensive examination of the impact of education on addressing SDoH using toolkits is necessary. A recent mixed-methods research conducted in Japan in 2022¹¹ aimed to fill these gaps. The research introduced the concept of Social Vital Signs (SVS) as a toolkit during its educational session. SVS involves a multi-professional collaboration and comprises the following steps: (i) collecting patient data based on pre-defined categories, which include the patient's social background and preferences, (ii) analyzing the reasons behind the development of the patient's current background, and (iii) determining appropriate actions to address the patient's challenges and fulfill their desire.¹² The concept of SVS has gained acceptance in primary care settings in Japan.^{12,13} In the previous study, the educational effectiveness of SVS-guided clinical encounters was evaluated using the New World Kirkpatrick Model, which has four levels of training evaluation: reaction, learning, behavior, and results.¹⁴ Quantitative analysis of the study revealed that the learners had good reactions, understood the meaning of SDoH and its impact well, and held positive attitudes toward communication about SDoH. Qualitative analysis revealed several key findings. Residents' learning from the session included a shift from focusing solely on patient characteristics to adopting a more professional perspective, placing value on patients' preferences, and being aware of the potential to overlook issues when relying solely on the mnemonic. Additionally, residents shifted from direct problem-solving to prolonged involvement with patients. The study also found that residents implemented new practices based on their learning, reflected on their roles as medical professionals, and expressed concerns about addressing patients' social conditions.

The previous study has two major limitations. First, the findings mentioned above were derived from a small number of participants

in a single educational session. Second, while qualitative findings are valuable in generating hypotheses, it is crucial to validate these hypotheses through further empirical investigation. Although quantitative findings about the reaction and part of learning were obtained, the learners' outcomes in the levels of learning and behavior were not validated quantitatively.

Considering these research contexts, we aimed to further elucidate how learners are affected by postgraduate education (a single 90-min educational session) regarding tool-guided clinical assessment of patients' social backgrounds and performed quantitative evaluation in the levels of learning and behavior. This will enable us to gain further insight into the effectiveness of employing a tool-guided clinical approach to SDoH in postgraduate education.

2 | METHODS

2.1 | Study design and setting

The research adopted a pretest-posttest design and recruited participants consisting of residents in their first or second postgraduate year (PGY) and fellows specializing in family medicine (PGY 3 or more). Educational sessions on SDoH were conducted by the first author in response to requests from seven clinical training programs in Japan (2 programs in Tokai-Hokuriku district, 1 in the capital area, 1 in the northern Kanto district, 1 in Kinki district, 1 in Chugoku-Shikoku district, and 1 in Kyusyu district) between 2021 and 2023, with all sessions being held online due to the COVID-19 pandemic. All the participatory programs consisted of community-based small-scale residencies (the total number of residencies: 40). All residents and fellows who belonged to the residencies participated in the sessions. They were invited to join the study before each session, being informed that their participation was voluntary, their anonymity was preserved, and that nonparticipation would not result in any disadvantages. All participants submitted consent forms for participation. There were no exclusion criteria for participation.

Before the recruitment process, we calculated the necessary sample size to be 106. The detailed calculation process is shown in [Table S1](#).

2.2 | The design of the session

The purpose of the educational session was to introduce the learners to the concept of SDoH and assist them in addressing their patients' social concerns to provide personalized medical care. The details of the session are shown in [Figure 1](#).¹³ The duration of the session was approximately 90 min. The session design was based on Mezirow's Transformative Learning Theory, which suggests that learners can experience transformative learning through a disorienting dilemma or a jarring experience that challenges their preconceived beliefs.¹⁵

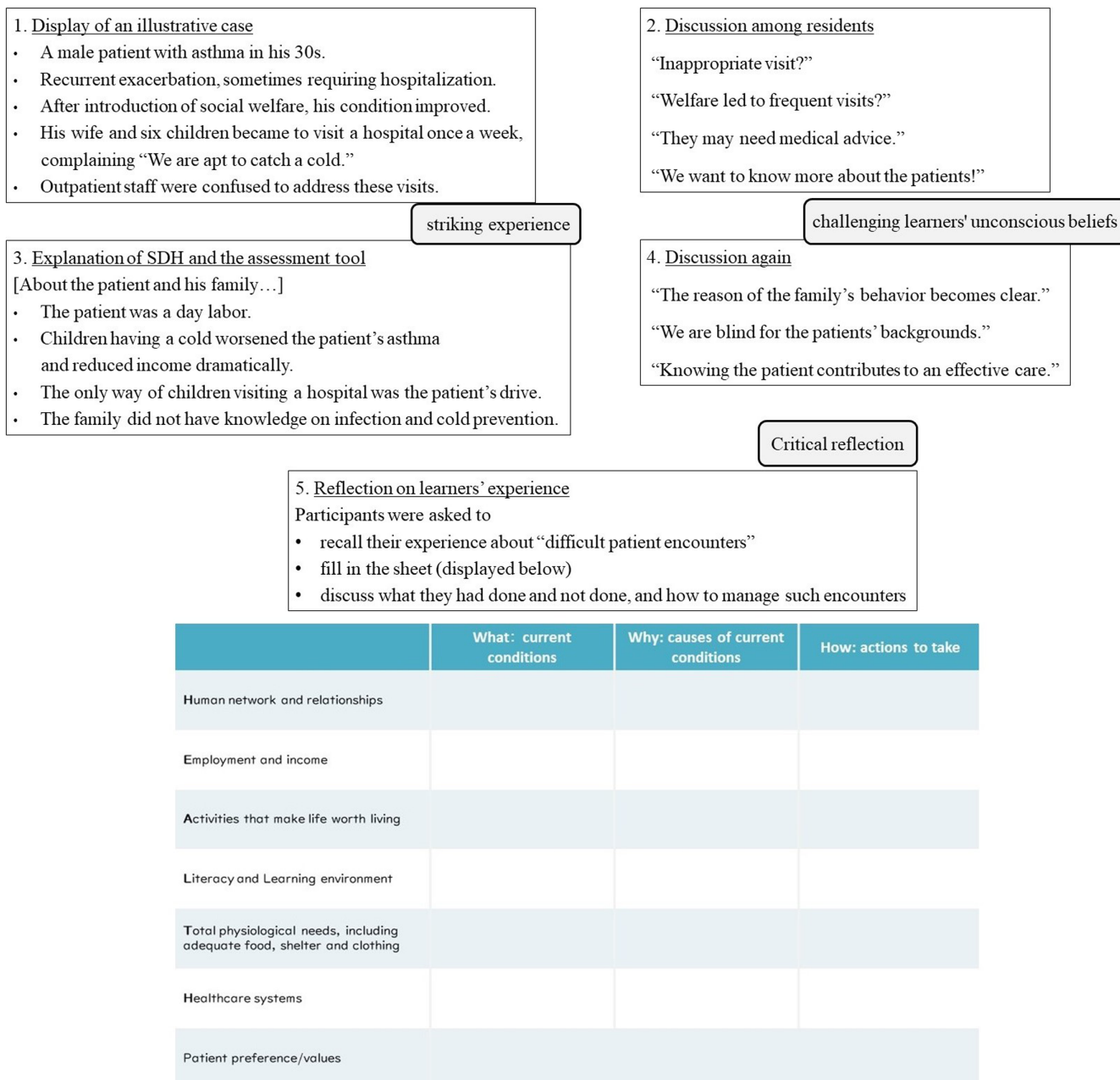


FIGURE 1 Overall design of the session based on Mezirow's transformative learning theory.

This can lead to a critical reflection of their frame of reference and the acquisition of new perspectives. To facilitate a transformative learning experience, the session was structured in five steps. First, participants were presented with an illustrative case of patients exhibiting seemingly selfish behavior. Second, they were asked to analyze their emotions toward the patient and consider their subsequent course of action. Third, an explanation of SDoH and the assessment tool was provided, followed by the presentation of the social background of the patients. Fourth, participants were asked to reevaluate how they would respond to the patients, considering the newly presented information. Fifth, participants were requested to recall past “difficult patient encounters” they had experienced and complete a sheet based on those patient interactions.

2.3 | Outcome measurement

To quantitatively evaluate the qualitative findings of the previous study in the levels of learning and behavior, the author team, consisting of Ph.D. students and experts in medical education research, formulated 14 Likert-type questions (five-point scale; 1: strongly disagree, 2: disagree, 3: neither agree or disagree, 4: agree, and 5: strongly agree) through iterative discussion. A formulated questionnaire is shown in Table 1. Four of these questions (Questions 1 to 4) assessed the learning from the sessions, with one question (“1. I want to know more about a patient's social background when a patient is obviously likely to have difficulties judging from the patient's appearance, speech, or behavior.”) designed to have scores

TABLE 1 Questionnaire formulation.

Qualitative themes	Likert-type questions
Shifting from patient characteristics to the view of a medical professional	1. I want to know more about a patient's social background when a patient is obviously likely to have difficulties judging from the patient's appearance, speech, or behavior 2. I want to know more about a patient's social background when I am wondering how I should take care of the patient
Acceptance of the checklist	3. When asking questions about a patient's social background, I prefer to follow a predefined format
Shifting from direct problem-solving to prolonged involvement	4. It is important to stay engaged with a patient's social challenges in the long run, even if they cannot be resolved immediately
Negative consequence of lack of understanding of patients	5. I feel that the lack of adequate understanding of the patient's social background by healthcare professionals can result in disadvantages for the patient
Positive and concrete future visions	6. The skills to deal with patients' social challenges can be acquired through learning
Putting patients' social backgrounds into a medical context	7. I respond to patients' social challenges as a healthcare professional in the clinical setting
Knowing patients as they are	8. I recognize and accept the patients as they are
Enriching understanding and care induced by awareness	9. When being aware of the patient's social challenges, I change my approach to patient care based on my awareness of the challenges
Platform for interprofessional collaboration and its advancement	10. I collaborate with other healthcare professionals to approach the patient's social background
Concerns that patients would complain too much	11. I am concerned that asking about and assessing the patient's social background may result in a situation that is out of my control
Concerns that biomedical evaluation would be ambiguous	12. I am concerned that asking about and assessing the patient's social background may neglect medical assessment
Concerns that patients would suffer loss of dignity	13. I am concerned that asking about and assessing the patient's social background may hurt the patient
Concerns that the cost of evaluation would be excessive	14. I am concerned that asking about and assessing the patient's social background may take a lot of time and effort

that remained constant or decreased with learning. Responses to these questions were collected before, immediately after, and 1.5 months after the session. The other 10 questions (Questions 5 to 14) assessed the learning and behavior that would be acquired through clinical experience after the sessions. Four of these questions assessed concerns about using the tool, with higher scores indicating greater concern. Responses to these questions were collected before and 1.5 months after the session. The previous study¹¹ suggested that learners adjusted what they learned through clinical experience, rather than simply adapting learning from the session to their daily care, and that learners acquired relevant knowledge and demonstrated behavior changes even within 1 month following the session. In addition, we were cognizant of the fact that the educational impact of the session could potentially diminish if there was a prolonged period before data collection. Therefore, we distinguished between learning immediately after the session, and learning and behavior gained through clinical experience 1.5 months after the session.¹¹

2.4 | Data analysis

We assumed that the Likert scale followed an approximately linear distribution.¹⁶ The Likert-type scale responses were summarized

using mean and 95% confidence intervals. The outcomes were evaluated using paired-sample *t*-tests between pretest and posttest scores, and the effect size was measured using Cohen's *d*.¹⁷ A commonly accepted moderate effect size in evaluating the skills and confidence of learners in addressing SDoH was observed to have values of Cohen's *d* greater than 0.5.¹⁸ This positive change was interpreted as an indication of their improved performance. To enhance the robustness of our analysis, we also conducted the Wilcoxon signed-rank test, considering the possibility of the Likert scale being ordinal in nature. The *z*-score and corresponding *p*-score were calculated, as detailed in Tables S2 and S3.

3 | RESULTS

A total of 130 residents and fellows were recruited, and 114 participated. The number of PGY-1 residents was 79 (69.3%), PGY-2 23 (20.2%), and fellows 12 (10.5%). This disproportion was because some programs only included PGY-1 in their educational sessions. The median age of the participants was 27 (interquartile range: 25–30.25). The number of self-reported men was 86 (75.4%). All participants submitted their answers before and just after the session. Among the participants, 13 participants did not answer the questions 1.5 months after the session.

TABLE 2 Mean scores for learning before and immediately after the session ($n=114$).

Item	Pre-test mean score (95% CI)	Post-test mean score (95% CI)	<i>p</i> -value (paired t-test)	Cohen's <i>d</i>
1. I want to know more about a patient's social background when a patient is obviously likely to have difficulties judging from the patient's appearance, speech, or behavior	4.14 (3.97–4.30)	4.48 (4.36–4.61)	<0.001	0.73
2. I want to know more about a patient's social background when I am wondering how I should take care of the patient	4.10 (3.94–4.26)	4.51 (4.40–4.63)	<0.001	0.86
3. When asking questions about a patient's social background, I prefer to follow a predefined format	3.46 (3.25–3.68)	4.11 (3.91–4.30)	<0.001	0.74
4. It is important to stay engaged with a patient's social challenges in the long run, even if they cannot be resolved immediately	4.34 (4.21–4.47)	4.71 (4.62–4.81)	<0.001	0.98

Abbreviation: CI, confidence interval.

Regarding learning from the sessions, all four questions (Questions 1 to 4) showed significant increases, all items over 0.7 of Cohen's *d* in the mean score just after the session compared with before (Table 2). At 1.5 months after the session, the score of Question 2 ("I want to know more about a patient's social background when I am wondering how I should take care of the patient.") and Question 3 ("When asking questions about a patient's social background, I prefer to follow a predefined format.") still increased with Cohen's *d* of 0.84 and 0.61, respectively.

Regarding learning and behavior 1.5 months after the session, the scores of Question 6 ("The skills to deal with patients' social challenges can be acquired through learning"), Question 8 ("I recognize and accept the patients as they are") and Question 9 ("When being aware of the patient's social challenges, I change my approach to patient care based on my awareness of the challenges") increased moderately (Cohen's *d*: 0.50, 0.56 and 0.65, respectively.) Regarding concerns about addressing patients' social conditions, no items showed significant score changes; Table 3 shows the details.

4 | DISCUSSION

This study investigated the learner-reported outcomes of educational sessions on tool-guided SDoH assessment in the levels of learning and behavior. First, the session encouraged learners to inquire about the social backgrounds of their patients. This finding appears to align with previous research indicating that post-graduate education on SDoH and the use of screening toolkits can foster professionals' interest and attention toward patients' social backgrounds.^{19,20} Unlike the qualitative findings from prior research, participants were more interested in learning about social backgrounds when they anticipated their patients to have apparent challenges, although the magnitude of this change was relatively minor. Patients with social needs may undergo a distinct course of disease and treatment,^{21–23} and recognizing these unique conditions and delivering personalized care may be an essential skill for medical professionals.^{24,25}

Second, participants readily embraced a pre-established framework to assess patients' social backgrounds. Despite the differences in social challenges in various practice settings,²⁶ learners desire

a clinical guide to communicating with patients about social challenges.²⁷ Furthermore, the session might influence participants to perceive addressing patients' social backgrounds as a learnable skill. Medical education has not clearly defined what learners should do to respond to SDoH in a clinical setting, which may reduce their motivation to learn about SDoH.^{28,29} Providing a clear direction may aid in taking the first step toward social approaches, as advocated in prior research.⁶

Third, the session empowered participants to accept their patients and to improve their attitudes. This is a crucial effect because a good patient-physician relationship is linked to an effective approach to patients' social backgrounds.³⁰

Fourth, participants might not experience any specific intervention leading to improved patient outcomes. This could be because the duration of practice in the clinical setting was only 1.5 months. In addition, residents in Japan often rotated through a variety of departments, and some residents reported that they were unable to implement clinical practice because they were assigned to a department where they did not have direct patient contact. Furthermore, given the previously reported large gap between SDoH screening and referral,³¹ introducing additional clinical resources, including streamlined workflows, universal guides, and assignment of dedicated professionals is needed to encourage learners to perform contextualized care.^{31,32} All the medical education about SDoH should be designed to correct inequities in patient outcomes,⁹ and a longitudinal educational course may be more effective.^{33,34}

Fifth, the concern among participants regarding the implementation of practices related to SDoH did not increase. One possible explanation for this result is that being a resident in small-scale community-based facilities might mitigate the impact of these concerns. Residents in small-scale community-based residencies often encounter patients with various difficulties and require interprofessional collaboration to understand patients' social contexts,³⁵ which may provide them with the resources needed to address patients' social challenges and help them to cope with lack of time and resources, which have been reported as a significant factor in these concerns.³⁶ Another explanation is that some learners had few interactions with patients and thus less concern about disadvantages. Although the trends suggested in the previous mixed-methods

TABLE 3 Mean scores for learning and behavior before and 1.5 months after the session ($n=101$).

Item	Pre-test mean score (95% CI)	Post-test mean score (95% CI)	<i>p</i> -value (paired <i>t</i> -test)	Cohen's <i>d</i>
1. I want to know more about a patient's social background when a patient is obviously likely to have difficulties judging from the patient's appearance, speech, or behavior	4.23 (4.06–4.39)	4.40 (4.26–4.54)	0.049	0.53
2. I want to know more about a patient's social background when I am wondering how I should take care of the patient	4.16 (4.00–4.32)	4.52 (4.40–4.65)	<0.001	0.84
3. When asking questions about a patient's social background, I prefer to follow a predefined format	3.50 (3.27–3.73)	3.93 (3.73–4.13)	<0.001	0.61
4. It is important to stay engaged with a patient's social challenges in the long run, even if they cannot be resolved immediately	4.40 (4.26–4.53)	4.50 (4.36–4.63)	0.22	0.47
5. I feel that the lack of adequate understanding of the patient's social background by healthcare professionals can result in disadvantages for the patient	4.35 (4.22–4.47)	4.34 (4.20–4.47)	0.90	0.15
6. The skills to deal with patients' social challenges can be acquired through learning	3.91 (3.73–4.10)	4.11 (3.95–4.27)	0.032	0.50
7. I respond to patients' social challenges as a healthcare professional in the clinical setting	3.42 (3.23–3.61)	3.56 (3.39–3.74)	0.15	0.42
8. I recognize and accept the patients as they are	3.38 (3.19–3.56)	3.62 (3.46–3.79)	0.019	0.56
9. When being aware of the patient's social challenges, I change my approach to patient care based on my awareness of the challenges	3.52 (3.34–3.70)	3.84 (3.68–4.00)	<0.001	0.65
10. I collaborate with other healthcare professionals to approach the patient's social background	3.96 (3.77–4.15)	4.12 (3.95–4.29)	0.11	0.43
11. I am concerned that asking about and assessing the patient's social background may result in a situation that is out of my control	3.23 (3.10–3.57)	3.34 (3.10–3.57)	0.46	0.27
12. I am concerned that asking about and assessing the patient's social background may neglect medical assessment	2.60 (2.35–2.83)	2.64 (2.40–2.88)	0.71	0.18
13. I am concerned that asking about and assessing the patient's social background may hurt the patient	3.40 (3.17–3.63)	3.50 (3.27–3.74)	0.43	0.28
14. I am concerned that asking about and assessing the patient's social background may take a lot of time and effort	3.50 (3.25–3.74)	3.45 (3.21–3.68)	0.70	0.18

Abbreviation: CI, confidence interval.

research were not observed quantitatively in this study, educators should be aware that the concern may be magnified in some residents.

There are several limitations to this study that should be acknowledged. First, the questionnaire used in the study was not validated, as there is currently no validated tool for assessing SDoH-related competency. Future research should focus on developing and validating such a tool. Second, the study only included residents and fellows from specific community-based residency programs in Japan. These programs requested the first author to deliver educational sessions and seemingly had a great interest in SDoH. This limits the generalizability of the findings to other settings or populations. Third, the study did not collect patient-reported outcomes, which is an important area for future research in this field. Future studies should aim to evaluate the impact of SDoH education on patient outcomes and experiences. In addition, a multi-professional assessment of the learners should be included. Fourth, our study design, which was a pre-post study, did not clearly demonstrate the educational effect. The fact that the first author

delivered the educational session might increase the Hawthorne effect. Furthermore, the participants had a relatively short period of 1.5 months to integrate their learning into their clinical practice. To effectively demonstrate a clear and long-term impact of the educational session, alternative study designs, such as a randomized controlled study, would be necessary. Fifth, we refrained from conducting a comparison between residents and fellows due to the small number of participating fellows. Further research is needed to explore the variation in learning and behavior based on learners' experiences.

5 | CONCLUSION

This study suggests that an educational session on tool-guided SDoH assessment has a positive impact on learners' attitudes and behaviors related to addressing patients' social backgrounds, without fostering concerns. There are still challenges to overcome, such as limited opportunities to practice in clinical settings and the

need for more longitudinal educational courses. Further research is needed to validate questionnaires for learners' assessment, focus on actual changes in learners' behavior and patient-reported outcomes, and evaluate the effectiveness of longitudinal and comprehensive education programs.

CONFLICT OF INTEREST STATEMENT

The author has stated explicitly that there are no conflicts of interest in connection with this article.

ETHICS APPROVAL STATEMENT

This study was approved by the Research Ethics Committee of the University of Tokyo Graduate School of Medicine and Faculty of Medicine (No. 2021186NI).

PATIENT CONSENT STATEMENT

All participants submitted consent forms for participation.

CLINICAL TRIAL REGISTRATION

None.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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