Brief Report

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Implementation and evaluation of a structured lecture-based training program for early-career pharmacists

Yuma Nonomiya[1,2,*], Masashi Nakamura[2], Tomonori Nakamura[1], Masakazu Yamaguchi[2]

[1] Division of Pharmaceutical Care Sciences, Center for Social Pharmaceutical Care Sciences, Keio University Faculty of Pharmacy, Tokyo, Japan;
[2] Department of Pharmacy, Cancer Institute Hospital, Japanese Foundation for Cancer Research, Tokyo, Japan.

SUMMARY: Since 2022, the Cancer Institute Hospital of the Japanese Foundation for Cancer Research (JFCR) has participated in a postgraduate clinical training program organized by the Japanese Society of Hospital Pharmacists. Subsequently, the training system for newly employed pharmacists was reviewed. Beginning in 2023, a structured lecture-based training program was introduced for young pharmacists (employees in their first to fifth years of practice). To evaluate the effectiveness and usefulness of the newly implemented lecture-based training program (LBTP), a questionnaire survey was conducted using open-ended and multiple-choice questions based on a 5-point Likert scale. The lectures were conducted with the participation of 12 individuals, all of whom had less than five years of professional experience. All lectures received high ratings in terms of content and the participants' level of understanding, suggesting a high degree of overall satisfaction. Furthermore, after the lectures, the lecturers reported an increased understanding of the lecture-based training program and expressed their willingness to contribute actively in the following fiscal year. Both the participants and lecturers reported high levels of satisfaction, demonstrating the usefulness of the program. As the JFCR is a cancer-specialized hospital, there is a need for more proactive learning on topics beyond oncology. The LBTP had a positive impact on both participants and lecturers, contributing to the enhancement of education for new staff members.

Keywords: Questionnaire survey, postgraduate clinical training, psychological safety

1. Introduction

Since 2022, the Department of Pharmacy at the Cancer Institute Hospital of the Japanese Foundation for Cancer Research (JFCR) has participated in the postgraduate clinical training program organized and implemented by the Japan Society of Hospital Pharmacists. The aim of this training program is to contribute to the development of a standardized postgraduate training curriculum used in healthcare institutions and pharmacies, with a view to linking it to future preclinical education in pharmaceutical studies. The postgraduate clinical training guidelines set 13 training items, and it was mandated that each item would be evaluated through rubric-based assessments. Additionally, pharmacists were required to deepen their understanding of their roles within team-based healthcare and to enhance their knowledge of pharmacotherapy across a broad range of medical specialties (*1*). JFCR is a cancer-specialized hospital, and while adequate lectures and education in the oncology field are provided, the training items related to other areas had not been clearly defined. Therefore, we considered it crucial to reevaluate the pharmacist training program at JFCR and to develop a novel educational lecture-based training program (LBTP).

Unlike traditional university-style lectures where information is passively absorbed, LBTP incorporates small-group learning approaches such as Problem-Based Learning (PBL) and Team-Based Learning (TBL), fostering active engagement and collaborative learning (*2*). The participants of the LBTP were designated as early-career pharmacists (from their 1st to 5th year of practice). Except for first-year pharmacists, early-career pharmacists were tasked not only with attending the lectures but also with lecturing. The purpose of having early-career pharmacists serve as lecturers was to enhance and refine their own knowledge through the process of teaching (*3*). In response to the growing emphasis placed by the Japan Hospital Pharmacists Association on the active involvement of pharmacists in team-based medical care, pharmacists actively engaged in intra-hospital teams were appointed as lecturers. These individuals not only introduced their respective teams but also provided comprehensive lectures on the professional functions and roles of pharmacists within these teams.

This study aims to evaluate the effectiveness and practical utility of LBTP primarily designed for early-career pharmacists.

2. Methods

2.1. Questionnaire survey

A questionnaire survey was conducted targeting 12 pharmacists belonging to the pharmacy department of the JFCR, following the LBTP held from June 2023 to February 2024. The questionnaire survey was conducted with both 12 participants and 16 lecturers (Supplementary Figure S1, A and B, *https://www.ddtjournal.com/action/getSupplementalData.php?ID=269*). After the final lecture, a survey regarding new employee training lectures was conducted (Supplementary Figure S1, C, *https://www.ddtjournal.com/action/getSupplementalData.php?ID=269*). The questions were developed by the authors.

2.2. Evaluation methods

A simple tabulation was performed using a 5-point Likert scale for the attributes and surveys related to each lecture. Changes in questionnaire scores before and after the lecture were analyzed using the Wilcoxon signed-rank test. Statistical analyses were performed using SPSS software version 24 (IBM Corp.), with the level of significance set at less than 5%. Changes in the lecturers' mindset before and after the lectures were evaluated by asking questions and requesting responses on a 5-point scale (1 = "Do not agree," 2 = "Somewhat disagree," 3 = "Neutral," 4 = "Somewhat agree," and 5 = "Agree"). Box plots were created using JMP Pro 18 software (SAS Institute, Japan).

2.3. Ethical considerations

This study was submitted to the Ethics Review Committee of the Cancer Institute Hospital of JFCR; however, it was determined that the study did not fall under the category of life sciences or medical research, and therefore, a review was deemed unnecessary. The purpose of the study, questionnaire items, response methods, privacy protection measures, data handling, and contact information were explained to the survey participants, and their consent was obtained. Personally identifiable information was not obtained.

3. Results and Discussion

As shown in Table 1 and Figure S2 (*https://www.ddtjournal.com/action/getSupplementalData.php?ID=269*), participants reported high scores for all lectures across multiple dimensions, including interest in the topic, clarity of the lecture slides, content comprehension, and overall satisfaction. These positive results are likely attributable to the program's clearly defined target audience—early-career pharmacists with less than five years of experience—and the deliberate optimization of lecture content based on the participants' expected baseline knowledge and professional context. This targeted approach helped to reduce mismatches between content difficulty and audience capability, thereby enhancing learning effectiveness. Furthermore, the 30-minute lecture format (20 minutes for presentation and 10 minutes for Q&A) appeared appropriate, aligning with prior studies that suggest shorter lectures more effectively maintain attention and satisfaction among adult learners (*4,5*). The active learning environment, supported by a robust Q&A structure, further contributed to increased participant engagement (*6*). Lecturer

Table 1. Overview of new employee training lectures and questionnaire collection rates

	Content	Pharmacist career (year)	Questionnaire collection rate *n* (%)
1st	Certified pharmacist system	5	12/12 (100)
2nd	Pediatrics	5	12/12 (100)
3rd	Head and Neck Surgery Procedures and Oral medication management	4	12/12 (100)
4th	Insulin Injection	2	10/12 (83.3)
5th	Suppositories	2	10/12 (83.3)
6th	Renal function and injury	4	10/12 (83.3)
7th	Hepatic function and injury	4	8/11 (72.7)
8th	Pharmacist intervention points in head and neck cancer	5	10/12 (83.3)
9th	High-risk medicine	15	11/12 (91.7)
10th	TDM	21	11/12 (91.7)
11th	Preoperative drug discontinuation	9	10/12 (83.3)
12th	Medical fee calculation	10	10/12 (83.3)
13th	PUT	20	11/12 (91.7)
14th	ICT	13	11/12 (91.7)
15th	NST	10	11/12 (91.7)
16th	PCT	12	10/12 (83.3)

PUT, Pressure Ulcer Care Team. ICT, Infection Control Team. NST, Nutrition Support Team. PCT, Palliative Care Team.

feedback (Figure 1) adds another layer of insight into the program's impact. While 50% of lecturers did not find the slide preparation burdensome, 37.5% did feel burdened by the process.

Nevertheless, 75% of the lecturers agreed that a 30-minute session was appropriate, and 68.8% reported spending 2 to 6 hours on slide preparation (Figure 1A), suggesting a moderate and manageable workload. Importantly, lecturers' self-reported motivation significantly increased from a pre-lecture median score of 2.8 to a post-lecture median of 4.3 ($p < 0.01$; Figure 1B), indicating a marked shift from initial reluctance or anxiety to greater engagement and satisfaction. Additionally, willingness to deliver the same or a different topic in the following year also increased, with median scores of 4.2 and 3.7, respectively (Figure 1C), both showing statistically significant improvements.

These findings suggest that the lecture experience itself served as a form of professional development, helping early-career pharmacists gain confidence and derive a sense of achievement through successful knowledge sharing. Indeed, such successful experiences positively impact one's mindset (*7*), fostering not only competence but also intrinsic motivation and professional identity formation. The program was independently developed at our institution to address existing gaps in non-oncology education, particularly given Japan's increasing emphasis on the training of generalist pharmacists. Our hospital, being oncology-focused, has limited opportunities for early-career pharmacists to gain exposure to a broader spectrum of diseases. The LBTP was thus designed not only as a knowledge dissemination platform but also as a professional development tool. By encouraging junior pharmacists to select lecture topics, create educational materials, and deliver presentations, the program fostered key competencies such as proactivity, planning, communication, and professionalism (*8,9*). This structure allowed for both horizontal (peer-based) and vertical (mentor-based) learning.

Despite its successes, the program has notable limitations. First, this study was conducted as a cross-sectional survey within a single institution, limiting the generalizability of the findings. Without longitudinal

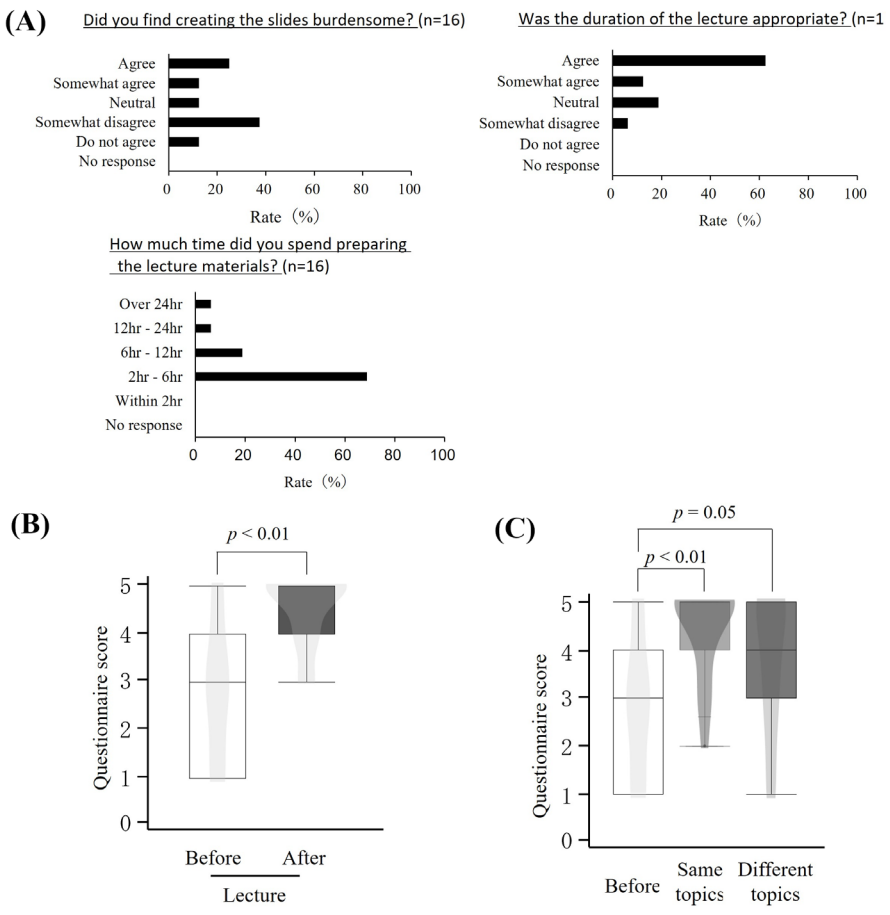

Figure 1. Lecturers' perceptions and emotional changes related to the LBTP. (**A**) Lecturer's burden regarding the lecture. (**B**) Changes in lecturers' attitudes towards the lecture before and after the session. (**C**) Changes in lecturers' attitudes when asked to lecture on the same or a different theme in the following year.

follow-up, the sustainability of the observed benefits, such as retained knowledge or behavioral change in clinical settings, remains unknown. Second, the LBTP was developed without benchmarking against standardized or evidence-based models used in other institutions, potentially missing opportunities to adopt best practices. Third, the study relied solely on subjective, self-reported measures. While these provide valuable insights into perceived effectiveness, they cannot fully assess objective learning outcomes or changes in clinical performance. No pre- and post-tests or performance-based assessments were conducted to verify whether actual knowledge or skills improved as a result of the training. Future research should aim to overcome these limitations through multi-institutional, longitudinal studies incorporating objective assessment tools such as knowledge tests, skill-based evaluations, and patient care indicators. This approach would allow for a more comprehensive understanding of the LBTP's real-world impact on pharmacist development and patient safety.

Few previous studies have evaluated educational lectures from both the participant and lecturer perspectives or incorporated design elements that emphasize psychological safety by restricting participation to a specific peer group. The overwhelmingly positive reception of this program from both audiences suggests that such a structure may contribute not only to cognitive learning but also to emotional and professional growth. The dual benefit — to both learners and lecturers — supports the potential for training programs to serve as platforms for mutual development.

In conclusion, the LBTP developed and implemented at our institution proved to be a meaningful educational initiative that benefited participants and lecturers. By combining structured learning with opportunities for teaching and reflection, the program fostered not only knowledge acquisition but also professional growth, confidence, and mindset change. Continued refinement, including the introduction of objective evaluations and broader institutional collaboration, is warranted to further enhance its effectiveness and sustainability.

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Conflict of Interest: The authors have no conflicts of interest to disclose.

References

1. Ministry of Health, Labor and Welfare of Japan. *https://www.mhlw.go.jp/content/11120000/000946955.pdf* (accessed November 10, 2024).
2. Mori J. A guide for active and interactive lecture. Shinshu Med J. 2014; 62:25-32.
3. Oyama M, Matsuda T. Current trends and perspectives of ICT utilization in active learning. Japan J Educ Technol. 2018; 42:211-220. (in Japanese)
4. Dent JA, Harden RM. A practical Guide For Medical Teachers. Shinoharashinsha Publishing Inc, 2010, pp. 56-65.
5. Bunce DB, VandenPlas JV, Havanki KL. Comparison of the effectiveness of a student response system versus online WebCT quizzes. J Chem Educ. 2006; 83:488-493.
6. Ishikawa N, Kogo C. Self-regulated learning and problem-solving strategies used by students in online universities. Japan J Educ Technol. 2018; 41:329-343. (in Japanese)
7. Fujimura M. The effects of reflection of success and failure experience on the confidence and effort. Fukoka Jogakuin Daigaku kiyoo. 2014; 15:81-87. (in Japanese?)
8. Inoue H, Uchihashi K, Hirano S, Fujimoto T, Nishikawa Y. Examination of the usefulness of classes using clicker-aided technology on knowledge retention in dental education. J Jap Dent Educ Assoc. 2018; 34:25-32. (in Japanese)
9. Matsushita K. Self-directed learning in university classrooms: from the perspective of learning theories. J Japan Assoc Coll Univ Educ. 2009; 31:14-18. (in Japanese)

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**Address correspondence to:*
Yuma Nonomiya, Division of Pharmaceutical Care Sciences, Center for Social Pharmacy and Pharmaceutical Care Sciences, Keio University Faculty of Pharmacy, 1-5-30 Shibakoen, Minato-ku, Tokyo 105-8512, Japan.
E-mail: nonomiya-ym@keio.jp

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