

## Development of Versatile and Interactive Model Lessons in Kampo Medicine Education

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(Received June 9, 2022; Accepted July 7, 2022)

**Objective:** To develop versatile and interactive model classes by generating the contents of Kampo classroom sessions that can be taught by instructors who are not familiar with Kampo medicine.

**Methods:** In 2018, we conducted Kampo classroom sessions among fourth-year medical students at Kyushu University in which we incorporated new content. A videotaped digest edition of the classes was sent to Kampo medicine instructors in medical schools throughout Japan. An online questionnaire was given to the instructors regarding effectiveness of the class content (Q1) and whether they would introduce the content in their classes (Q2). We modified the curriculum according to survey responses and conducted revised classroom sessions again in 2019. A second online survey was given and we finalized the model classes. We compared survey responses between staff and instructors (group A) and non-specialists in Kampo medicine (group B).

**Results:** In 2018, there were significant differences between groups A (44) and B (52) regarding a patient's story and case report (Q1). In 2019, there were significant differences between groups A (42) and B (54) regarding the case report using e-learning(Q1) and an instructor's experience (Q2).

**Conclusions:** We propose that Kampo medicine classes should incorporate an instructor's experience and interactive case report presentation using e-learning.

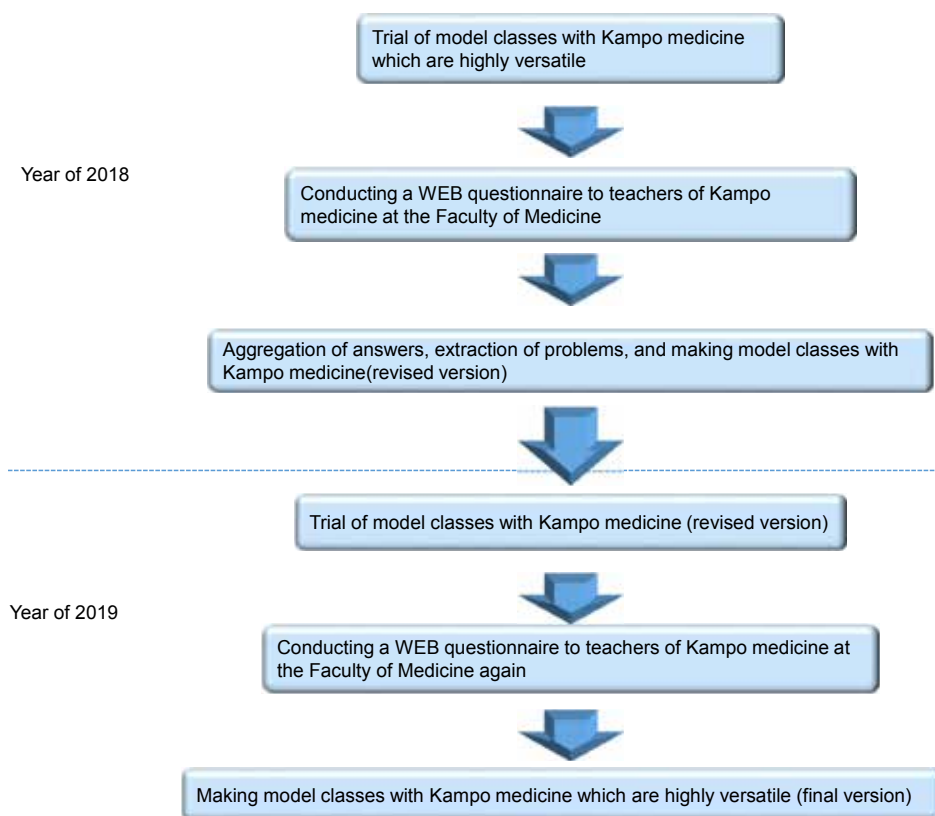
**Key words:** Model class, Kampo medicine, versatility, e-learning, interactivity

### INTRODUCTION

Traditional Japanese medicine was imported from China in around the sixth century, disseminated throughout Japan, and later modified into the domestic version currently in use, called Kampo medicine. Kampo medicine is integrated into Japan's health care system, and over 90% of Japanese physicians prescribe Kampo in clinical practice.

In 2001, the Japanese Ministry of Education, Culture, Sports, Science and Technology announced that instruction in basic Kampo medicine was to be incorporated in the core curriculum of all medical schools. In 2016, the description of Kampo medicine in the Japanese medical education model core curriculum was revised to "Outlining the characteristics of Kampo medicine: Adaptation and pharmacological effects of major Kampo formulas (herbal medicine)" [1]. Basic Medical Education: Japanese Specifications ver. 2.1, introduced by the Japan Accreditation Council for Medical Education (JACME) on May 20, 2016, stated that medical school curricula should ensure "contact with complementary medicine" as a standard

for improving the quality of medical education. Complementary medicine is defined as "including unorthodox, traditional, and alternative medicine." Kampo medicine is considered to be complementary medicine and must be included in medical education [2, 3]. Therefore, instruction in Kampo medicine in undergraduate medical education is rapidly increasing. However, three main problems were reported in a 2011 survey: a shortage of Kampo education sessions and expert Kampo educators, and a lack of standardized educational material and methods [4]. To address the lack of standardized educational material and methods, the Japan Kampo Medicine Education Council was established in 2014 to create a unified curriculum for Kampo medicine education. The goal of the Council was to develop a common model Kampo educational curriculum. However, the curriculum involves passive classroom learning; thus, students' proficiency levels may be low. To raise students' interest in Kampo medicine and recognize the need for Kampo in modern medicine and in future medical education, the content of curricula and how to teach Kampo must be revised. Of note, it has been reported that active learn-



**Fig. 1** Study protocol

ing raises the motivation of students to learn Kampo medicine [5–7].

Since 2005, Kyushu University School of Medicine has provided a systematic lecture on Kampo Medicine in collaboration with other faculties. The lecture comprises eight sessions (one session: 90 minutes) as part of integrated medical education during the first half of the fourth year. However, until now, the level of proficiency in the lectures alone has been low.

Active learning has been included as an elective for a small number of medical students during the second half of the fourth year, in which students' satisfaction and proficiency has been very high (data not shown). Therefore, we consider that interactive and active learning might be necessary in Kampo medicine education. However, the abovementioned survey highlighted the shortage of instructors in Kampo medicine; therefore, instructors who are not very familiar with the philosophy of Kampo medicine often the ones who teach it. This is a very important issue in standardizing education in Kampo medicine. Therefore, hearing from instructors who are not very familiar with Kampo medicine is also valuable.

The purpose of this study was to develop a highly versatile and interactive model lesson by generating the contents of Kampo classroom sessions that can also be taught by instructors who are not familiar with Kampo medicine.

## MATERIALS AND METHODS

In this study, we used action research methodology [8, 9]. The study design included four phases: planning, action, observation, and reflection (Fig. 1). This study was approved by the Institutional Review Board of Kyushu University (30–28).

### Phase 1: Planning

Beginning in 2005, we conducted eight class meetings on Kampo medicine among fourth-year medical undergraduate students in Kyushu University (Table 1). From our experiences, we considered that five content items were useful for deepening the understanding of Kampo medicine, and we incorporated these items in the abovementioned eight classroom lessons. The five items are listed below. We included items 1 and 2 in the introduction to Kampo medicine, added items 4 and 5 to lessons in diagnosis and clinical practice of Kampo medicine, and conducted an interactive classroom session using a clicker. We also allowed for time to freely sample Kampo herbal decoctions and to touch and smell crude medicinal products during the break (item 3).

1. Recounting a patient's story in which Western medical treatment was ineffective and they were treated successfully with Kampo medicine.
2. Sharing the experience of an instructor who learned Kampo medicine after practicing in a specialized field of Western medicine.
3. Tasting actual herbal medicines (decoctions) and crude herbal medicines (if students wish).
4. Students conduct diagnosis of their condition from the perspective of Kampo medicine.
5. Diagnosis of a case report from the perspective of Kampo medicine.

### Phase 2: Action

In 2018, we conducted trial model classes in Kampo medicine among fourth-year undergraduate medical students.

**Table 1** Eight classes in Kampo medicine at Kyushu University

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1. Introduction to Kampo medicine
  2. Problems with and usefulness of Kampo medicine from the viewpoint of pharmacology
  3. Typical formulas with a six-stage pattern
  4. Typical formulas with a qi pattern
  5. Typical formulas for disorders of blood and fluid
  6. Types and proper use of Kampo formulas, and their pharmacological mechanisms of action
  7. Diagnosis and clinical practice of Kampo medicine
  8. Role of Kampo medicine in modern Western medicine
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**Phase 3: Observation**

We recorded each classroom session and created a digest version in cooperation with Kyushu University Teaching Material Development Center. We then administered an online questionnaire among 458 clinical faculty members of the Faculty of Medicine. We included some members who were not familiar with Kampo medicine but who conducted lectures in Kampo medicine at universities nationwide. The survey comprised the following questions for classroom items 1 to 5 above: (Question 1) From the viewpoint of versatility, is the content effective for learning Kampo medicine? (Question 2) Would you introduce the content in your classes? Responses were given using a 5-point Likert scale. Responses “I very much think so” and “I think so” were considered effective content items, and responses “I would very much like to introduce” and “I would like to introduce” indicated that the content item would be introduced by the instructor.

**Phase 4: Reflection**

Using the responses from clinical faculty members, we extracted problematic issues, and developed a revised version of the model lessons in Kampo medicine.

**STATISTICAL ANALYSIS**

We compared questionnaire responses between two groups: staff and instructors (group A) and non-specialists in Kampo medicine (group B). Furthermore, we compared responses by both groups between surveys conducted in 2018 and 2019. Categorical variables were compared using Fisher's exact test. All statistical analyses were performed using JMP Ver. 16 (SAS Institute Japan Ltd., Tokyo, Japan). We set  $P < 0.05$  to indicate statistical significance.

**RESULTS**

In 2018, 96 respondents (21.0%) completed the questionnaire (group A: 44, group B: 52). Responses for each question (1 and 2) and item (1 to 5) are described below.

**Question 1: From the viewpoint of versatility, is the content effective for learning Kampo medicine? (Fig. 2)**

- (1) Patient's story, effective: 79.5% of group A and 61.6% of group B, with a significant difference between groups ( $P = 0.0141$ ).
- (2) Instructor's experience, effective: 81.8% of group A and 75.0% of group B.
- (3) Experiential training in Kampo herbal medicines, effective: 84.1% of group A and 80.7% of group B.
- (4) Students perform diagnosis, effective: 84.1% of group A and 84.6% of group B.

- (5) Case report, effective: 88.7% of group A and 75.0% of group B, with a significant difference between groups ( $P = 0.0323$ ).

**Question 2: Would you introduce the content in your classes? (Fig. 3)**

- (1) Patient's story, yes: 29.6% of group A and 30.8% of group B.
- (2) Instructor's experience, yes: 63.7% of group A and 51.9% of group B.
- (3) Experiential training, yes: 63.6% of group A and 50.1% of group B.
- (4) Students perform diagnosis, yes: 47.7% of group A and 50.0% of group B.
- (5) Case report, yes: 52.2% of group A and 48.1% of group B.

The following issues were pointed out in free-text commentary regarding item (1).

1. This is a case report; it is not evidence-based. It is better to explain the mechanism of action or this could be considered promotion of Kampo medicine.
2. The patient's personal information is not protected when describing this case publicly using the patient's name.
3. No one can confirm this story.

On the basis of the survey responses, we modified the patient's story to a video format. We also switched to a case with supporting evidence or in which the mechanism was explained.

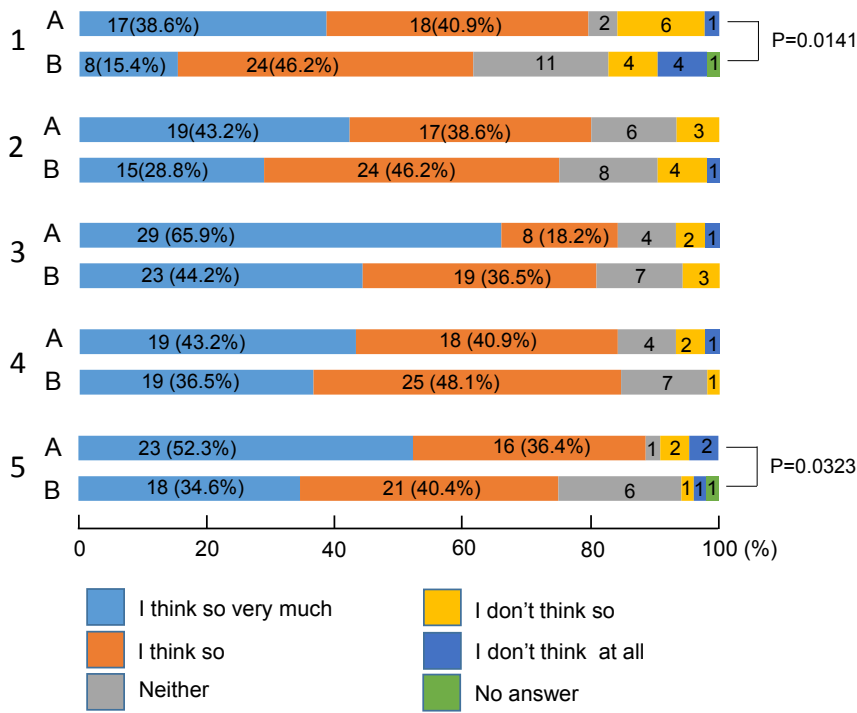
Several problems were pointed out regarding item (3).

1. How herbal medicines are obtained.
2. Allergic reactions to the medicines.
3. Requiring all students to participate in the experiential activities.
4. Shortages of staff to provide this training.

We modified the format of the experiential training as follows. First, we conducted a lecture explaining typical Kampo medicines and crude herbal products. Then, during the break time, only students who wished to participate in the experiential activities (tasting and inspecting the herbal medicines) could do so.

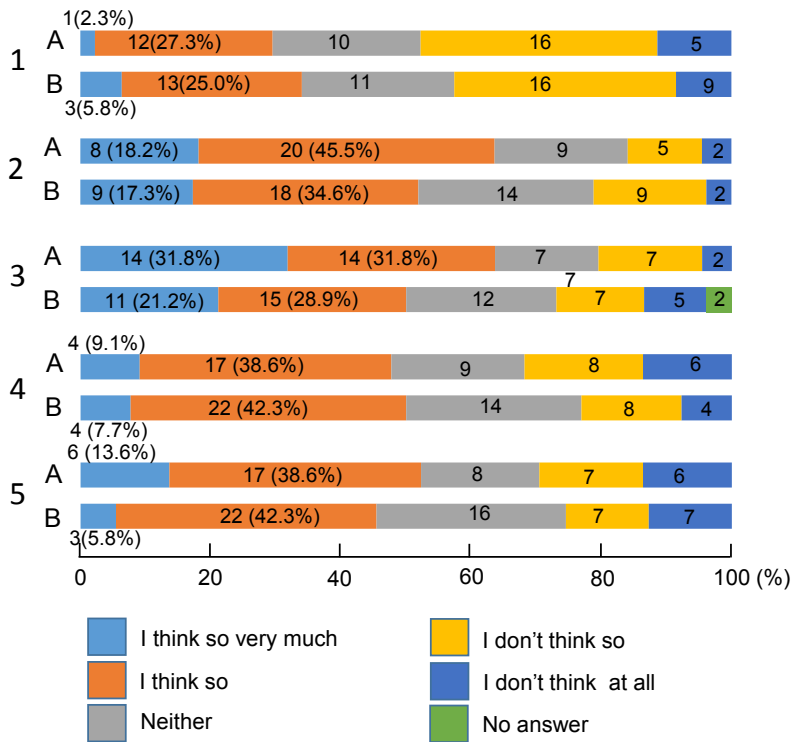
The following issues were mentioned regarding items (4) and (5).

1. We do not have a clicker.
2. It is difficult to provide an explanation regarding suitable prescriptions to undergraduate students.
3. The vague case presentation should be revised and further details should be given in the case report.



1. Patient's story that western medical treatment was ineffective and Kampo treatment was successfully effective.
2. Teacher's experiences who learned kampo medicine after engaging in a specialized field of Western medicine
3. drinking real herbal medicines(decoction) and tasting crude drugs
4. To diagnosis students themselves from the point of view of Kampo medicine
5. To discuss about the case from the point of view of Kampo medicine

**Fig. 2** Responses by respondents in groups A and B to question 1 in 2018. (1) Patient's story, (2) Instructor's experience, (3) Experiential training in Kampo herbal medicines, (4) Students perform diagnosis, (5) Case report.



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**Fig. 3** Responses by respondents in groups A and B to question 2 in 2018. (1) Patient's story, (2) Instructor's experience, (3) Experiential training in Kampo herbal medicines, (4) Students perform diagnosis, (5) Case report.

We changed to an e-learning system (Moodle) for the interactive class session. We also revised presentation of the case report; students were only required to discuss the diagnosis according to Kampo medicine; instructors explained the case report in detail.

In 2019, we conducted a second trial using the revised model classes in Kampo medicine. We then sent a second online questionnaire to the same 458 clinical faculty members who conducted lectures in Kampo medicine at universities nationwide.

In 2019, 96 participants (21.0%) (group A: 42, group B: 54) completed the questionnaire.

**Question 1: From the viewpoint of versatility, is the content effective for learning Kampo medicine? (Fig. 4)**

- (1) Patient's story, effective: 42.9% of group A and 40.7% of group B.
- (2) Instructor's experience, effective: 76.2% of group A and 66.6% of group B.
- (3) Experiential training, effective: 88.1% of group A and 77.7% of group B.
- (4) Students perform diagnosis, effective: 81.0% of group A and 81.4% of group B.
- (5) Case report, effective: 83.4% of group A and 72.2% of group B, with significant differences between groups ( $P = 0.0055$ ).

**Question 2: Would you introduce the content in your classes? (Fig. 5)**

- (1) Patient's story, yes: 28.5% of group A and 20.4% of group B.
- (2) Instructor's experience, yes: 71.4% of group A and 51.9% of group B, with significant differences between groups ( $P = 0.0168$ ).
- (3) Experiential training, yes: 64.3% of group A and 57.4% of group B.
- (4) Students perform diagnosis, yes: 54.7% of group A and 51.8% of group B.
- (5) Case report, yes: 76.2% of group A and 53.7% of group B.

**Comparison between responses of each group in 2018 and 2019**

In groups A and B, there were significant differences between survey responses in 2018 and 2019 regarding effectiveness of the patient's story ( $P = 0.0045$  and  $0.00472$ , respectively).

We also conducted questionnaires among students in 2019. All 120 fourth-year students responded to the following question items.

**1) Effectiveness of class content in promoting understanding of the philosophy of Kampo medicine (Fig. 6).**

In total, 62.5%, 75.9%, 60.8%, and 70.8% of students stated that the patient's story, instructor's experience, experiential training in Kampo herbal medicines, and case report were effective, respectively.

**2) Effectiveness of class content in motivating students to pursue further education in Kampo medicine (Fig. 7).**

The proportion of students who felt that the patient's story, instructor's experience, experiential training in Kampo herbal medicines, and case

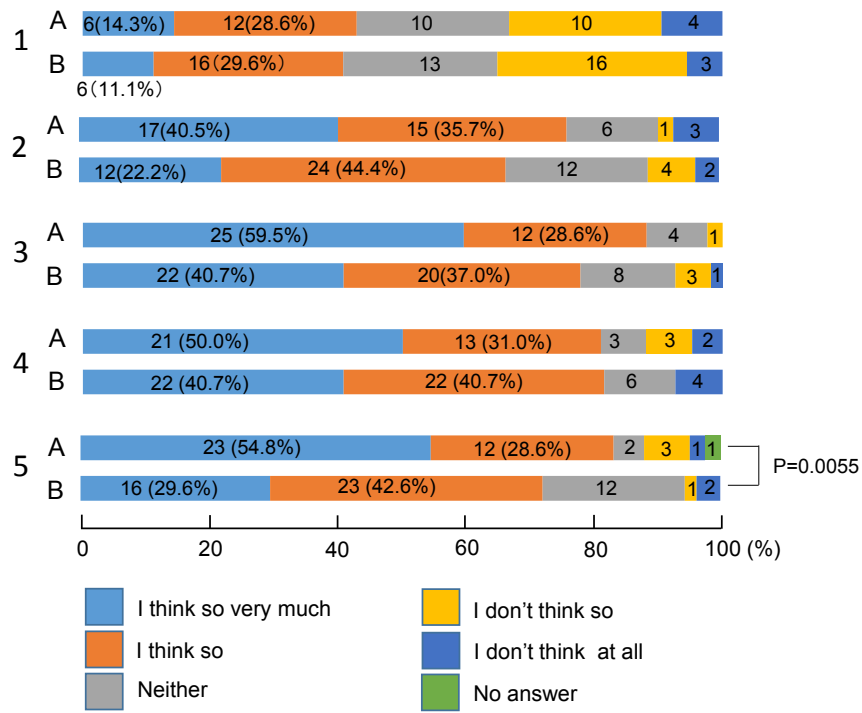
report motivated them to continue their education in Kampo medicine was 60.9%, 67.5%, 59.2%, and 65.0%, respectively.

## DISCUSSION

We performed a trial of model classes comprising interactive lessons in Kampo medicine, developed based on our previous experience. We aimed to develop model classes that are highly versatile in that the content can be understood and taught by specialists as well as non-specialists in Kampo medicine.

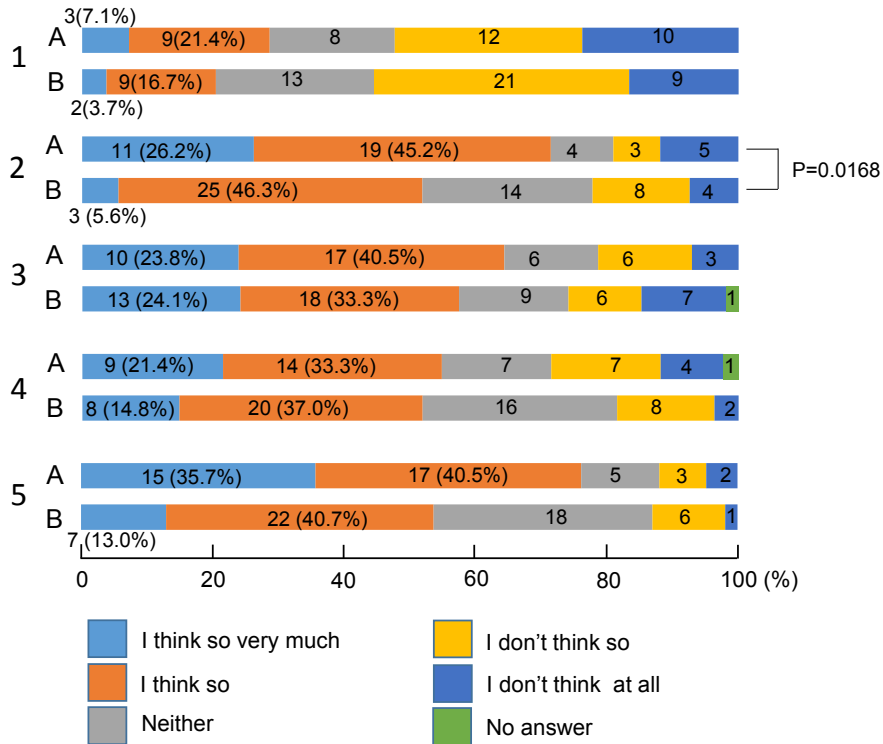
We developed five new content items and incorporated these into classroom lessons on Kampo medicine at Kyushu University. These items included a patient's story of a successful experience with Kampo medicine. Patient stories have emerged as a valuable educational resource [10]. In a first trial, we selected the story of a patient whose disease was unsuccessfully treated with Western medicine but was later effectively treated with Kampo medicine. Most instructors in our survey felt that the patient story was effective in Kampo medicine lectures, but few said they would introduce the story in their classes. After discussing respondents' feedback given in the free-text commentary, we selected the story of a different patient who was treated with a combination of Western and Kampo medicine for the next trial. However, in the second survey, respondents in both groups A and B felt that the effectiveness of the story was very low. Respondents judged from the clinical course that the improvement in this case was not owing solely to the effect of Kampo medicine. In comparison, students indicated that the patient's story was the most important item in motivating them to further their education in Kampo medicine. From these results, we think that the video format regarding a patient's story would be effective in Kampo medical education, but the contents must be developed. We consider that if a patient's story is introduced into the curriculum, a patient with evidence of the effectiveness of Kampo medicine must be selected. An even greater impression on students might be made if the patient's story is told in video format, after an interactive discussion of the case report.

Second, we incorporated the experience of an instructor who learned Kampo medicine after practicing in a specialized field of Western medicine in the classes. In the first trial, we selected an instructor who prescribed Kampo medicine according to the evidence; in the second trial, we selected an instructor who prescribed Kampo medicine according to the philosophy of Kampo medicine. Both instructors presented interesting reports, and in both trials, the positive evaluation was high, with more than half of instructors stating that they would introduce this item into their classes. Particularly in the 2019 trial, significantly more staff and instructors in Kampo medicine than non-specialists said they would introduce this item. This suggests that staff and instructors in Kampo medicine usually prescribe treatments according to its philosophy. Combined with responses from students, regardless of whether the presentation of Kampo medicine is based on pathophysiology according to Kampo medicine or based on evidence, we believe that an instructor sharing their experience of Kampo medicine being very useful in cases where Western medicine



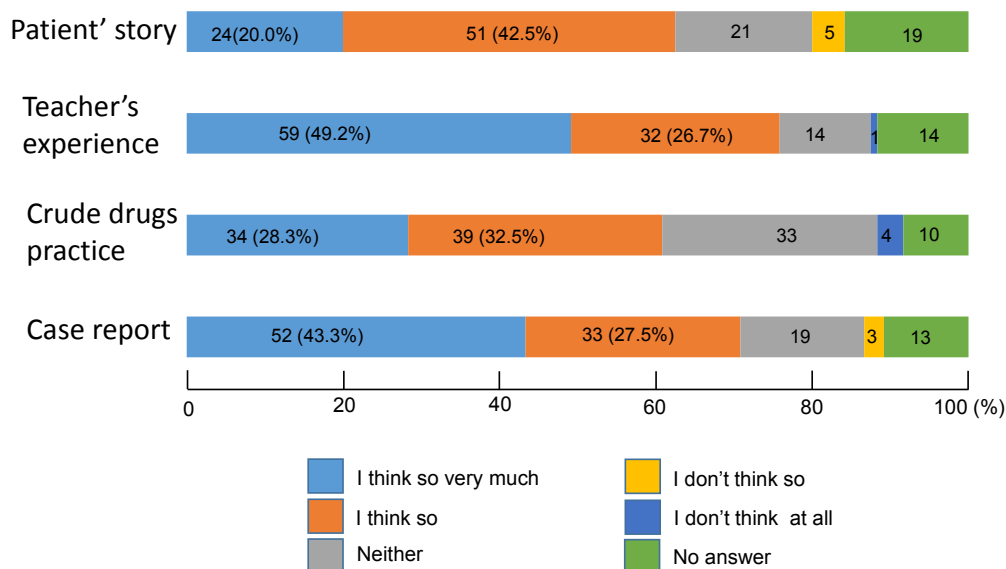
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**Fig. 4** Responses by respondents in groups A and B to question 1 in 2019. (1) Patient's story, (2) Instructor's experience, (3) Experiential training in Kampo herbal medicines, (4) Students perform diagnosis, (5) Case report.

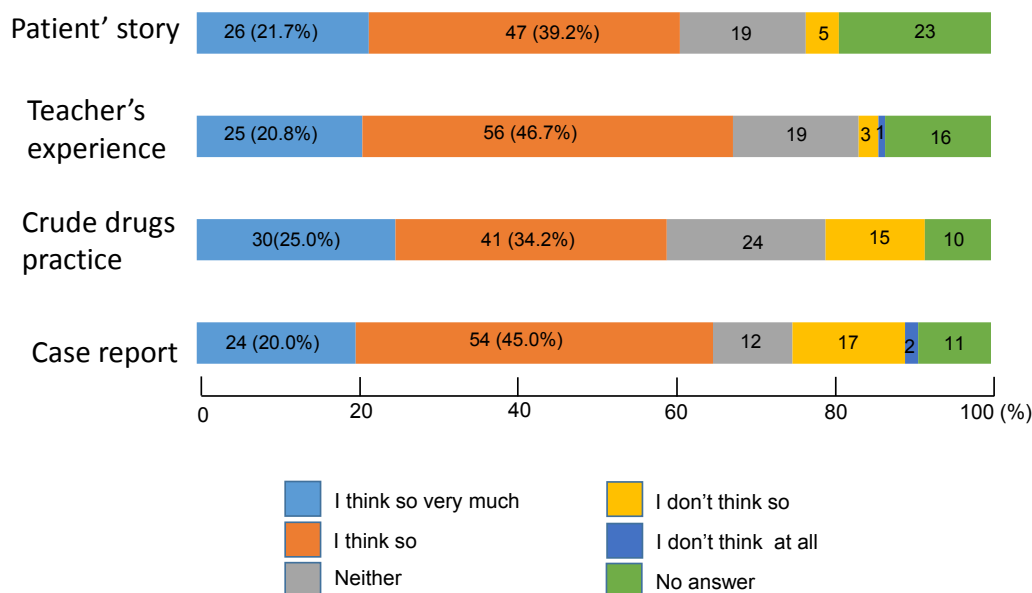


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**Fig. 5** Responses in groups A and B to question 2 in 2019. (1) Patient's story, (2) Instructor's experience, (3) Experiential training in Kampo herbal medicines, (4) Students perform diagnosis, (5) Case report.



**Fig. 6** Students' responses (n = 120) to the question, "According to the class content, do you understand the philosophy of Kampo medicine?"



**Fig. 7** Students' responses (n = 120) to the question, "According to the class content, do you want to further your education in Kampo medicine?"

was ineffective is important so that students can better understand the philosophy of Kampo medicine.

Third, we incorporated experiential activities into Kampo medicine classes, including tasting real herbal medicines (decoction) and crude herbal products. Such content has been reported to be effective for instruction in Kampo medicine, with experiential training in Kampo herbal medicines already introduced in facilities with which many of the Kampo instructors surveyed in this study were associated [4, 5, 11]. Although there was no significant difference between groups regarding this item, efficacy was considered high in both groups; thus, we believe that experiential training should be included in the curriculum. However, according to a national survey in 2019 about Kampo medicine, 13 of 82 medical schools in Japan (15.9%) had fewer than four Kampo classes [12]. Therefore,

we propose that experiential training in Kampo herbal medicines should be conducted during break times.

Finally, we added an activity in which students make a diagnosis and discuss a case report from the perspective of Kampo medicine, using interactive methods. It has been reported that active learning with an audience response system (polling) and e-learning system is useful [13]. A flipped classroom approach using a Kampo e-learning system has been reported to be effective [14]. Our content items were also considered to be very effective for learning Kampo medicine, according to our results. In our first trial, we used a clicker device as an interactive tool. However, we found that most medical schools do not have clickers; therefore, in the second trial, we used an e-learning system (Moodle) in class sessions. From the 2019 survey responses, we believe that interactive classes in Kampo

medicine using an e-learning system can be introduced in all medical schools. Similar to online classes held during the COVID-19 pandemic, voting using Zoom (Zoom Video Communications, Inc.) might be a useful tool. In both the 2018 and 2019 surveys, significantly more staff and instructors reported that the case report presentation was effective, in comparison with non-specialists. Non-specialists have few opportunities to discuss case reports from the perspective of Kampo medicine; therefore, a guide for instruction in case reports should be developed for non-specialists.

According to our study results, we propose that at least the following two content items should be incorporated into the common curriculum of Kampo medicine.

- 1) A university faculty instructor shares their experience of beginning to practice Kampo medicine after practicing in a specialized field of Western medicine. If possible, presentation should be included of interesting cases where Western medicine was ineffective but in which diagnosis and prescription were made according to the philosophy of Kampo medicine, which led to successful treatment.
- 2) Students themselves perform diagnosis in case reports from the perspective of Kampo medicine using an interactive e-learning system. A guide for instruction in case report presentation for non-specialists may be needed.

There are some limitations in this study. We made a digest version of the video recording and survey respondents were asked to evaluate the content items using this video. We shortened the video to the extent possible to reduce the burden on survey respondents; however, they may not have fully understood the information that we wished to convey in the video. The response rate to both questionnaires was low; therefore, the responses may not fully reflect overall opinions. In future surveys, frequent reminders and incentives will be needed to improve the response rate. This study was only conducted in Japan; therefore, the feasibility of our model classes in other countries, especially China and Korea, should be investigated.

### CONCLUSIONS

We developed versatile model classroom lessons by generating educational content in Kampo medicine. Our interactive model classes can be taught by instructors who are unfamiliar with Kampo. We believe that the model lessons developed in this study will contribute to improving Kampo medicinal education in Japan.

### CONFLICT OF INTERESTS

The authors declare no competing financial or non-financial interests related to this study.

### FUNDING

This study was supported by the Japan Kampo Medicine Education Foundation.

### ACKNOWLEDGMENT

We deeply thank Shinobu Shimada for her efforts in support of our study. We thank Analisa Avila, MPH, ELS, of Edanz (<https://jp.edanz.com/ac>) for editing a draft of this manuscript.

### AUTHORS' CONTRIBUTIONS

MK planned the study protocol, analyzed the data, and wrote the manuscript. KM assisted with planning of the study protocol and interpretation of the data. MS, EN, MJ, and ST participated in the data collection and interpretation of the data. All authors have read and approved the final manuscript.

### REFERENCES

- 1) The Japanese Ministry of Education Culture, Sports, Science and Technology. Model Core Curriculum for Medical Education in Japan, AY 2016 Revision, [https://www.mext.go.jp/component/a\\_menu/education/detail/\\_icsFiles/afieldfile/2018/06/18/1325989\\_30.pdf](https://www.mext.go.jp/component/a_menu/education/detail/_icsFiles/afieldfile/2018/06/18/1325989_30.pdf); 2017 [accessed 15 April 2022].
- 2) Gray AC, Steel A, Adams J. A critical integrative review of complementary medicine education research: Key issues and empirical gaps. *BMC Complement Altern Med* 2019; 19: 73. <https://doi.org/10.1186/s12906-019-2466-z>
- 3) Basic Medical Education: Japanese Specifications ver. 2.1. <https://www.jacme.or.jp/pdf/wfmf-jp2015.pdf>; 2016 [accessed 15 May 2022].
- 4) Arai M, Katai S, Muramatsu S, Namiki T, Hanawa T, Izumi S. Current status of Kampo medicine curricula in all Japanese medical schools. *BMC Complement Altern Med* 2012; 12: 207. doi: 10.1186/1472-6882-12-207.
- 5) Amitani M, Amitani H, Suzuki H, Kawazu S, Fukumoto T, Yamaguchi K, *et al.* Effective learning strategies for Japanese Kampo medicine using problem-based learning and simulator training for medical students: A questionnaire survey. *Traditional & Kampo Medicine* 2021; 8: 155-162.
- 6) Takayama S, Ishii S, Takahashi F, Saito N, Arita R, Kaneko S, *et al.* Questionnaire-Based Development of an Educational Program of Traditional Japanese Kampo Medicine Tohoku J Exp Med 2016; 240: 123-130.
- 7) Arai M, Takashi M, Nakada Y, Nogami T. Changes in Japanese Medical Students' Attitudes Toward Traditional Japanese Medicine over the Course of Medical School. *Tokai J Exp Clin Med* 2021; 46: 123-131.
- 8) Meyer J. 2000. Qualitative research in health care. Using qualitative methods in health related action research. *BMJ* 320: 178-181.
- 9) Cohen L, Manion L, Morrison K. 2008. *Research methods in education*. London: Routledge Falmer
- 10) Hung-Chang Liao, Ya-Huei Wang. Storytelling in Medical Education: Narrative Medicine as a Resource for Interdisciplinary Collaboration Int J Environ Res Public Health Vol17, 4 2020 Feb 11; 17(4): 1135. doi: 10.3390/ijerph17041135.
- 11) Kinoue T, Arai M, Nakada Y, Kajiwara K. "Kampo-sommelier Practice": A Trial for an Active Learning Program in Kampo (Japanese Traditional) Medicine. *Tokai J Exp Clin Med* 2020; 45: 63-68.
- 12) Nogami T, Arai M, Ishigami T, Nakada Y, Matsuda T, Odaguchi H, *et al.* Comparison of the 2011 and 2019 Kampo Medicine Curricula Across All Japanese Medical Schools *Tokai J Exp Clin Med* 2021; 46: 75-82.
- 13) Bucklin AB, Nancy L, Asdigian NL, Hawkins JL, Klein U. Making it stick: use of active learning strategies in continuing medical education *BMC medical education* 2021; 21: 44. doi: 10.1186/s12909-020-02447-0.
- 14) Ito A, Watanabe K, Fukuzawa Y, Mitani K, Fujimoto S, Matsuda T, *et al.* Development of Kampo (traditional Japanese medicine)-learning program: evaluation of the flipped classroom for medical students. *Med Educ Online* 2021; 26: 1938504. doi: 10.1080/10872981.2021.1938504.