

## Evaluation of Kampo Education with a Focus on the Selected Core Concepts

Makoto ARAI<sup>\*1</sup>, Katsuhiko ARAI<sup>\*1</sup>, Chizuko HIOKI<sup>\*1</sup>,  
Masanori TAKASHI<sup>\*1, 2</sup> and Masamitsu HONDA<sup>\*1, 3</sup>

<sup>\*1</sup>Department of Oriental Medicine, Tokai University School of Medicine

<sup>\*2</sup>Office of Acupuncture and Moxibustion, Tokai University Oiso Hospital

<sup>\*3</sup>Honda Clinic

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**Objective:** Japanese medical schools currently only offer students traditional Japanese Kampo medicine education for an extremely limited amount of time. The purpose of this study was to discover how to generate interest in and motivate learning Kampo medicine.

**Methods:** Kampo medical sessions, including a lecture series, written examinations, and small-group (12–14 students) EBL (experience-based learning) sessions, were provided for 4th-year medical students (N = 117) at Tokai University School of Medicine. Students were taught about “qi, blood, and fluid” and the “deficiency-excess pattern,” the two most important core concepts of Kampo medicine and connecting them to clinical application. We evaluated the teaching methods based on questionnaires and written examinations before and after the training course. The Wilcoxon signed-rank test was used to compare changes in awareness before and after the lectures and the Mann-Whitney U test to examine the relationship between the students’ interest in Kampo medicine and their examination scores.

**Results:** This training method improved students’ general understanding of Kampo medicine and increased their interest and motivation to study Kampo medicine.

**Conclusion:** Considering the current status of Kampo education, this training method is effective to educate students in the basic concepts of Kampo medicine.

**Key words:** Kampo education, Experience-based learning, “Qi, blood, and fluid,” “Deficiency-excess pattern,” Questionnaire survey

### INTRODUCTION

According to a questionnaire survey of the current status of Kampo medicine education in 2011 to the 80 medical universities in Japan [1], only 44% of the universities provided eight or more classes on Kampo medicine. The objective of this study was to review the effectiveness of an educational method to enhance medical students’ interest in and understanding of Kampo medicine and to increase their motivation to study it in the Kampo education course for which the number of class meetings are severely limited compared to those of Western medicine.

### SUBJECTS AND METHODS

In 2008, we offered nine class meetings on Kampo medicine to all of the 117 (60 men and 57 women) 4th-year students of Tokai University School of Medicine. The lectures simply focused on the two most basic concepts of “qi, blood, and fluid” (QBF), and the “deficiency-excess pattern,” to educate students on Kampo medicine from basic knowledge to clinical application through a series of lectures, written examinations, and experienced-based learning (EBL).

The QBF concept is actually a triad concept made up of three concepts used to represent a disturbance in the homeostatic condition of the body. “Qi” encompasses mental and neuronal activity, especially the

appetite and the process of digesting and absorbing nutrients. “Blood” is a general term that refers not only to the blood but also hormones, the autonomic nervous system, and other regulatory functions of the body’s internal environment. “Fluid” is a concept that encompasses overall water metabolism and various functions related to the body’s defense mechanisms such as the immune system.

The “deficiency-excess pattern” is a dual concept made up of two opposite patterns and comprises criteria to assess the current stamina degree of the body. The “deficiency pattern” is a state of lacking stamina and depressed physiological function, while the “excess pattern” is a general or pathologic state of considerable stamina and accelerated physiological function. We did not teach other basic Oriental-medicine concepts, such as “yin and yang,” “cold and heat,” “exterior and interior,” the “six stages of disease transformation,” or the “five viscera.”

Specifically, a total of six class meetings, consisting of two class meetings for the basic knowledge of QBF and the “deficiency-excess pattern,” one class meeting each on the differences in concepts between Kampo and Western medicine, the mechanism of action of Kampo formulas, the active ingredients and adverse reactions of crude drug components, and on an outline of acupuncture and moxibustion that was handed out. Regarding the written examination, two directives

on basic knowledge were given on the final day of the lectures to clarify, in the students' minds, the direction of study, as follows: "Explain the concept of QBF and related disorders in Kampo medicine" and "Explain the concept of the 'deficiency-excess pattern' in Kampo medicine."

All of the 4th-year students were divided into nine groups (12–14 students per group) for a 3-hour EBL course consisting of a 1-hour session for each of three subjects: Kampo medicine, acupuncture and moxibustion, and crude drugs. Three instructors and three part-time assistants were responsible for the overall teaching, and teams of one instructor and one assistant were in charge of each subject. The training was given to three groups per day and completed in three days.

For Kampo medicine training, the students self-evaluated the condition of their own QBF system using the QBF pattern scores of Terasawa, *et al.* [2, 3] for the purpose of clinical application of the knowledge obtained from the lectures and the examinations. Students used the basic examination methods of Kampo medicine, the "tongue examination," "pulse examination," and "abdominal examination," required for calculating the scores under the direction of an instructor. To practice acupuncture and moxibustion, all the students experienced needle insertion and application of moxa on a human patient simulator following a mini-lecture on "the major meridian points," i.e., specific acupuncture points for the needling techniques and moxa application trigger spots. In addition, the instructor actually performed acupuncture on a few volunteers so that the students could experience its efficacy firsthand. In the practice of decoction of two Kampo formulas, Keishito and Goreisan, the students learned the characteristics of crude drug components for these formulas. The students examined the main components of these formulas, including cinnamon bark of various grades from various districts producing it, comparing its color, odor, and taste [4].

Questionnaires were used to measure the students' interest levels in Kampo medicine before the lectures and after EBL (Appendices A and B). For statistical analyses, Wilcoxon's signed-rank test was used to compare changes in awareness before and after the lectures, and the Mann-Whitney U test was used to examine the relationship between the students' interest in Kampo medicine and their examination scores.

## RESULTS

### Study population

All of the 117 4th-year students of Tokai University School of Medicine participated in the lecture series on Kampo medicine, the written examinations, and the EBL sessions. Of all the students, 111 (94.9%) responded to the questionnaires before the lectures, 115 (98.3%) after the EBL sessions, and 109 students (93.1%) responded to both questionnaires.

### Overall evaluation of the Kampo training course

The results of 115 students who responded to the questionnaire after the EBL sessions were analyzed. Regarding understanding the contents of the training, 64% of the students thought that the lectures before the EBL sessions were "Very helpful," 33% thought

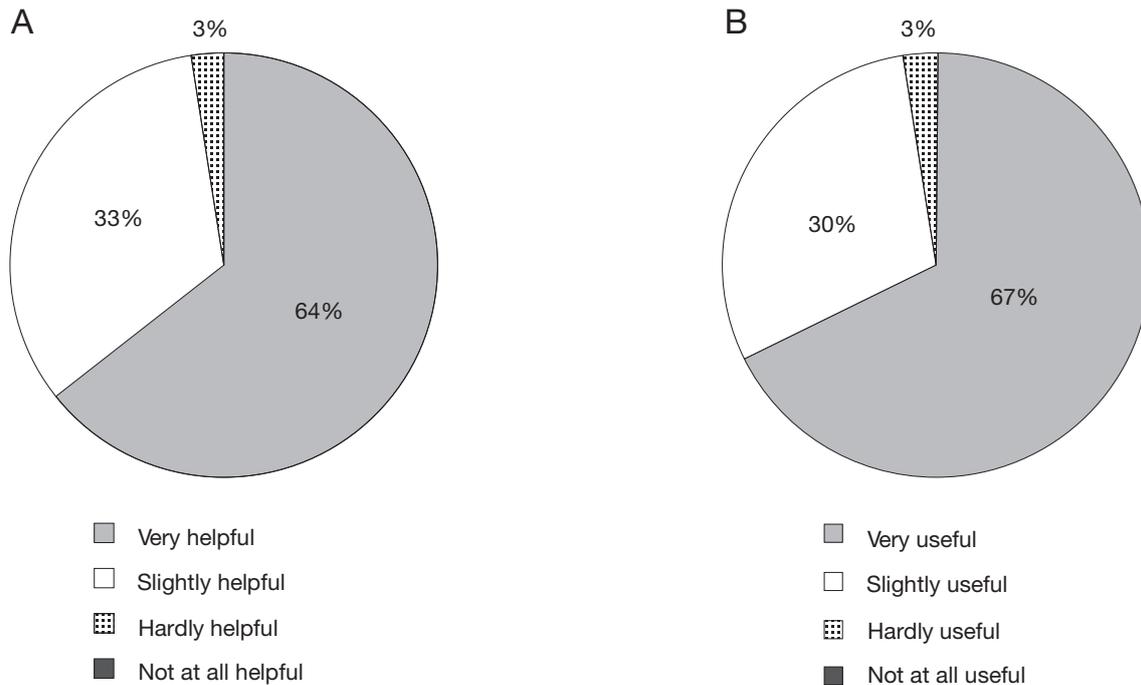
"Slightly helpful," 3% thought "Hardly helpful," and no one thought "Not at all helpful." As a beginning for the continuing study of Kampo medicine after becoming a practicing physician, 67% of the students thought that a lecture series and EBL sessions would be "Very useful," 30% thought "Slightly useful," 3% thought "Hardly useful," and no one thought "Not at all useful" (Fig. 1).

### Changes in awareness of Kampo medicine

Changes in awareness of Kampo medicine before the lectures and after the EBL sessions were analyzed using Wilcoxon's signed-rank test for the 109 students who responded to both questionnaires. To the question about the general impression of Kampo medicine, "Very good" was selected by 26% before the course and 39% after, "Slightly good" by 41% and 55%, "Neither good nor bad" by 32% and 6%, "Not very good" by 1% and 0%, and "Not good at all" by 0% and 0%, respectively. The overall impression of Kampo medicine was significantly improved after the lectures and the EBL sessions ( $p < 0.01$ ). Regarding interest in Kampo medicine, "Very interested" was selected by 26% and 42%, "Slightly interested" by 60% and 56%, "Hardly interested" by 11% and 2%, and "Not interested at all" by 3% and 0% of the responders before and after the course, respectively, showing a significant increase in the interest in Kampo medicine after the lectures and the EBL sessions ( $p < 0.01$ ). All of the 94 students who responded that they were interested (Very interested or Slightly interested) in Kampo medicine before the lectures remained interested after the EBL sessions. Of the 15 students who responded that they had no interest (Hardly interested or Not interested at all) before the lectures, 13 showed interest after the EBL sessions. Regarding prescribing Kampo formulas in the future, "Would mainly prescribe Kampo medicine" was selected by 1% before the course and 3% after, "Would mainly practice Western medicine and actively incorporate Kampo medicine" was selected by 54% and 68%, "Would mainly practice Western medicine and partly incorporate Kampo medicine" by 26% and 22%, "No intention of using Kampo formulas" by 2% and 1%, and "Do not know" by 17% and 6% of responders, respectively. Analysis of 86 students, after excluding 23 students who responded, "Do not know" to both questionnaires, showed an increase in the proportion of students who would be actively involved with Kampo medicine in their own practice of medicine in the future ( $p < 0.01$ ) (Fig. 2).

### Correlation of interest in Kampo medicine and examination results

Of the 109 students who responded to both questionnaires before the lectures and after the EBL sessions, those who were not interested in Kampo medicine before the lectures scored significantly lower compared with those who were interested ( $p < 0.05$ ). Most of the students (98%) showed interest after the EBL sessions, irrespective of their examination scores. No differences were observed in examination scores between those who selected "Hardly interested" and "Not interested at all" in Kampo medicine, between "Very interested" and "Slightly interested" before the



**Fig. 1** Overall evaluation of the Kampo training course  
 A. The percentages of the degree to which the lectures before the EBL sessions helped students understand the contents of the training  
 B. The percentages of the degree to which the lecture series and EBL sessions will be useful as a beginning for continuing study of Kampo medicine after becoming a practicing physician  
 n = 115

lectures or between those who selected “Very interested” and “Slightly interested” after the EBL sessions (Fig. 3).

#### Evaluation of the necessity of EBL sessions

There were 109 students who responded to both questionnaires before the lectures and after the EBL sessions. To the question concerning the necessity of EBL sessions for medical students, “All medical students should experience Kampo medicine as a required subject” was selected by 39% of the students before the lectures and 58% after the EBL sessions, “Need not be a required subject if Kampo medicine is available to all who wish to study it” by 53% and 37%, respectively, “Sufficient as an elective subject that can be taken by about a quarter of the students (30 students)” by 5% and 4%, and “Kampo medicine is a subject to be studied on one’s own therefore need not be included in the medical curriculum” by 3% and 1%, respectively. The number of students who thought it necessary to participate in the EBL sessions of Kampo medicine significantly increased after the EBL sessions compared with before the lectures ( $p < 0.01$ ) (Fig. 4).

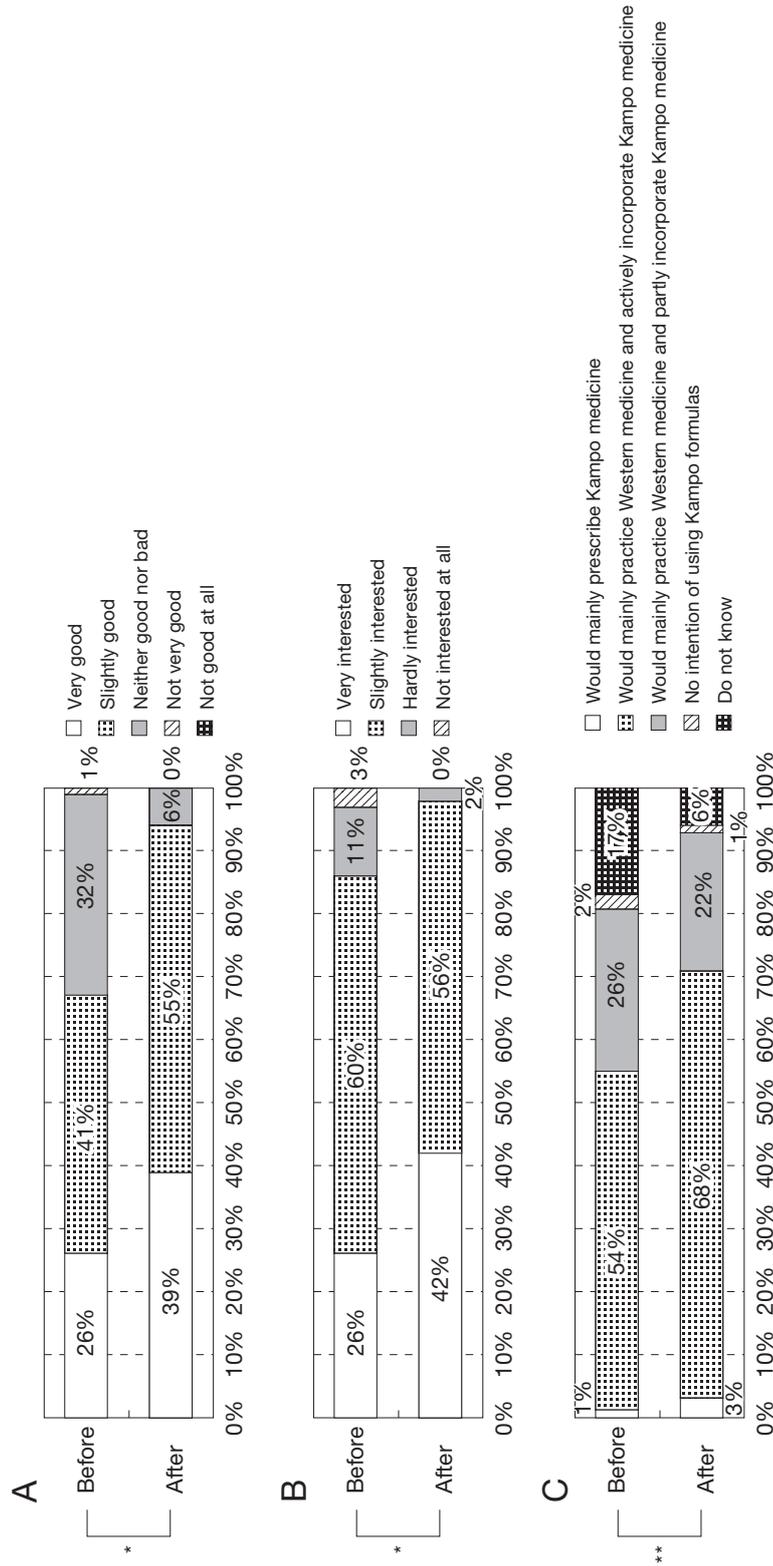
#### DISCUSSION

The Japanese Ministry of Education, Culture, Sports, Science and Technology announced in 2001 that instruction of basic Kampo medicine was to be incorporated into the medical education model core curricula. Since then, among all of the 80 Japanese universities with medical schools, an increasing number of them have integrated Kampo medicine into their curricula [5]. However, the motive to do so

varies greatly among schools because the contents to be taught are based on the discretion of each school and no questions on Kampo medicine have ever been asked on the National Medical Licensing Examination (NMLE) [6]. To promote Kampo education at medical schools, the instructors responsible for teaching it should recognize the need to implement the following items [7]: 1) curriculum standardization, 2) preparation of simple textbooks, 3) introduction of early hands-on learning, 4) improvement of educational environment to promote clinical training, 5) introduction of Kampo education into postgraduate clinical training, and 6) training instructors responsible for Kampo education.

The need for Kampo formulas is very high, based on the reports that 97% of physicians use Kampo formulas in the clinical setting [8]. Many medical students are very interested in Kampo medicine, as shown by the present survey: 86% of the students had already shown interest in Kampo medicine before the start of the lecture series, and more than 80% of the students showed interest in previous surveys [9–12]. These results are obviously higher than the 53% of those persons interested in Kampo medicine as discovered in a 2010 survey taken of the general public [13]. Moreover, it was previously reported that 66% of the medical students interested in Kampo medicine have a negative or skeptical image of it because it is suspicious and difficult to understand [9].

To increase their motivation to study Kampo medicine, an accurate concept of it should be conveyed and taught in university medical schools to all students in order to better train physicians to use Kampo medi-



**Fig. 2** Changes in awareness of Kampo medicine before the lectures and after the EBL sessions

A. General impression of Kampo medicine

B. Interest in Kampo medicine

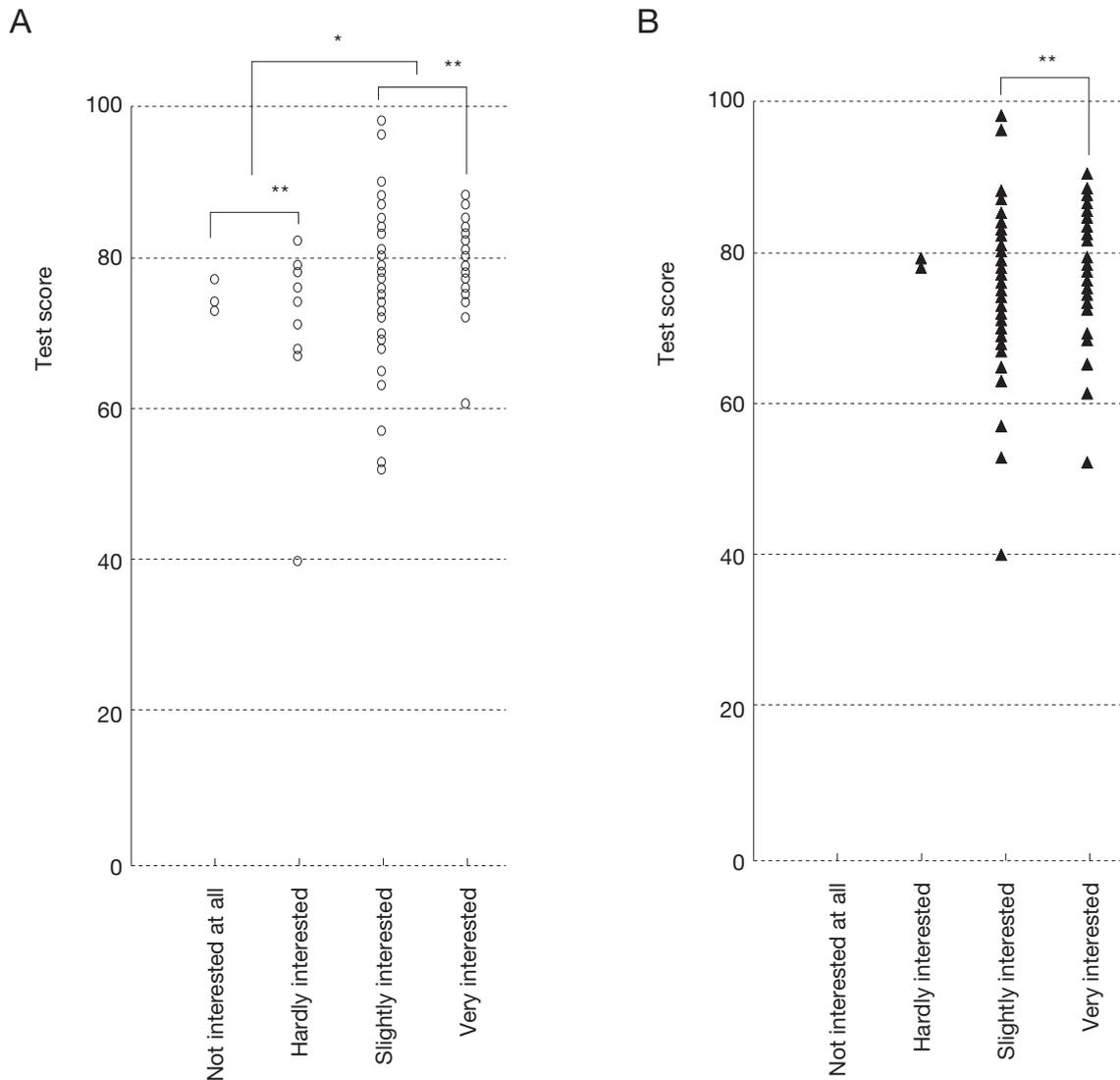
C. Would you prescribe Kampo formulas in the future as a practicing physician?

Wilcoxon's signed-rank test, n = 109, \* p < 0.01, \*\* n.s.

cine appropriately in clinical settings.

To properly teach Kampo medicine within the limited 9-hour course allocated by Tokai University, we selected the two basic concepts of QBF and the “deficiency-excess pattern” as the focal points of our lecture series and EBL sessions as the most important basic concepts of Kampo medicine. After the introductory detailed lectures on these two concepts, the students could confirm their own personal knowledge by studying for the written examinations and obtained

concrete ideas of clinical application of Kampo medicine in the EBL sessions. The above methods were considered to enable in-depth education, even though the scope was limited. QBF and the “deficiency-excess pattern” were announced before the examination as the themes of the descriptive written examinations in order to specify the points of study. These methods were also expected to help improve the students’ motivation to study Kampo medicine, which tends to be low mainly because it is currently not likely to be cov-



**Fig. 3** Correlation of interest in Kampo medicine and examination results evidenced by responders to both questionnaires (A) before the lectures and (B) after the EBL sessions  
Mann-Whitney U test,  $n = 109$ , \* $p < 0.05$ , \*\*n.s.

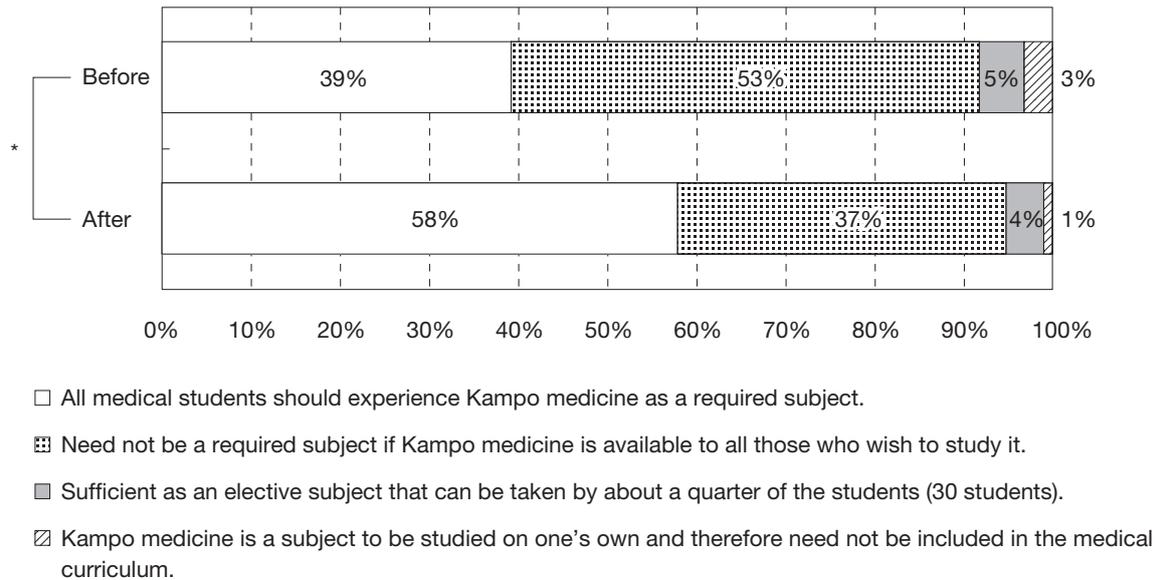
ered on the NMLE. To our knowledge, there has yet to be a report about such a curricular style of Kampo education in Japan; and, therefore, it is considered a unique feature of this study of medical education.

Nearly all the students (97%) in the present study responded that the lectures before the EBL sessions helped the students understand the contents of the practice, as in another survey in which 92% of the students reported that the lectures before the EBL sessions were helpful [14]. Thus, the training methods in the present study proved successful. Moreover, 97% of the students responded that a lecture series and EBL sessions would be helpful as a beginning to study Kampo medicine and then continue it in the future when they become practicing physicians. This can be interpreted to imply that they would not hesitate to start studying Kampo medicine when the necessity arises, even though the system is completely different from that of Western medicine.

The students' general impressions and interest in Kampo medicine were significantly improved after the lectures and EBL sessions ( $p < 0.01$ ). Regarding

the students' attitudes towards Kampo medicine in the future, the percentage of students who would mainly prescribe Kampo medicine or mainly practice Western medicine and actively incorporate Kampo medicine increased from 55% to 71% after the course, indicating that their intentions to actively use Kampo medicine in their practice became clearer and more firm ( $p < 0.01$ ). However, this tendency is observed with Kampo education in general [12] and may not actually be a characteristic result of this method.

QBF and the "deficiency-excess pattern" were selected as the two main themes of this educational method among the basic concepts of Kampo medicine including "yin and yang," the "deficiency-excess pattern," "exterior and interior," "cold and heat," QBF, the "six stages of disease transformation," and the "five viscera," among others. The reasons we selected these two concepts were that objective diagnoses using the scoring system of Terasawa, *et al.* [2, 3] were possible with QBF. The score of which partially included "tongue inspection," "pulse examination," and "abdominal examination." These were also among



**Fig. 4** Evaluation of the necessity of EBL sessions on Kampo medicine for medical students evidenced by responders to both questionnaires before the lectures and after the EBL sessions  
Wilcoxon's signed-rank test,  $n = 109$ ,  $*p < 0.01$

the check items to be scored, which facilitated their application to the EBL sessions. Many students were expected to have a disorder of QBF themselves due to stress and/or menstrual disorder. And we selected the "deficiency-excess pattern" because it was also included among the check items. Moreover, we felt that other concepts, such as "cold and heat" and the "six stages of disease transformation" would not be appropriate as main themes of this educational method because of the difficulty in making objective diagnoses using them.

Having the EBL sessions in small groups is considered to efficiently enhance students' motivation to study in a short time [4, 14] and would be a useful measure worth introducing into Kampo education. The 117 students of the present study were divided into 9 groups of 12 to 14 students per group, and a team of an instructor and a part-time assistant was in charge of one of the three subjects, Kampo medicine, acupuncture and moxibustion, and crude drugs. In my personal opinion, as an educator of this program, and having seen the results of it firsthand, the greatest advantage of using this educational method is that it assures careful guidance by being able to reach each student not only in large lecture classes but also in small groups and individually.

The fact that the number of students who recognized the necessity of EBL sessions significantly increased after the EBL sessions ( $p < 0.01$ ) suggested that the EBL sessions made a strong impression upon the students. They responded in the questionnaires that the lectures before the EBL sessions were helpful to better understand the contents of the training, so the organic relationship of the prior lectures and written examinations followed up with the EBL sessions was considered one of the reasons the students evaluated this training so highly.

The students uninterested in Kampo medicine before the lectures scored significantly lower on the written examinations compared with those who expressed

an interest in Kampo medicine, even though the questions on the written examinations were hinted at and announced in advance ( $p < 0.05$ ). However, most of the students showed an interest after taking part in the EBL sessions. These findings suggest that interest in Kampo medicine was enhanced with the EBL sessions even among the students who were uninterested in the beginning of the course.

It was pointed out that this method was also advantageous for instructors, because practice in small groups facilitated communication with students and enhanced their motivation to study Kampo medicine [15]. The instructors' change in awareness was considered another of the reasons this study was evaluated so highly.

One of the advantages of introducing a registered form into the questionnaires in this study was that it provided detailed analysis of the correlation between the examination results and the questionnaires, and the changes in awareness before and after the lecture series. It is, however, a possible limitation of this study that the findings might not accurately reflect the actual circumstances when the questionnaires are signed by the responders due to information bias in the responses, particularly when the instructors are entitled to know the results of the questionnaires [16]. To address this problem, I attempted to reduce bias by specifying at the top of the questionnaires that the students' replies on the questionnaires are not related to the final assessment regarding their academic achievement and sufficiently explained as much to them before they filled out the questionnaires.

The significance of incorporating Kampo medicine into the medical education is to train Japanese physicians clinically capable of using Kampo medicine comfortably in light of their background in Western medicine. The results of this questionnaire showed that more than 90% of the students would incorporate Kampo medicine in their future medical practice, but postgraduate training in Kampo medicine is very

limited [17] and inadequately addresses the needs of Kampo medicine therapies in actual clinical settings. Although there are so few Kampo class meetings for medical students in Japan, a standard curriculum should be prepared in reference to this training method and model. It would be possible to widely practice Japanese integrated medicine in the future by commencing a continuous Kampo education program beginning with education for medical students followed up with continued training throughout their careers in medicine.

It should also be noted that there were some students, who expressed a desire to specialize in Kampo medicine. In the current situation in which there is a shortage of instructors responsible for teaching Kampo medicine [5], it is desirable to recruit such personnel and quickly establish a specialized postgraduate Kampo education system to train them.

### Conclusions

Japanese medical schools currently only offer students traditional Japanese Kampo medicine education for an extremely limited amount of time. Even in such conditions, it was suggested that it would be possible to significantly improve the students' impressions of and interest in Kampo medicine, and to greatly enhance their motivation to study it by focusing on the basic themes in a lecture series, written examinations, and EBL sessions on the two most important basic concepts of QBF and the "deficiency-excess pattern," and by providing in-depth education starting with the selected core concepts moving up to clinical applications of Kampo medicine therapies. It was considered most appropriate to provide the lectures mainly on the QBF concept, which enables objective diagnoses by a simple, yet effective, scoring system. In consideration of this current educational situation for medical students, this unique educational method has been shown to be useful and provides an efficient beginning to the continuing training in Kampo medicine.

### Competing interests

I, Makoto Arai, personally have no competing financial or non-financial interests in this study; however, the Department of Oriental Medicine, Tokai University School of Medicine, did receive a grant from Tsumura, a Japanese manufacturer of Kampo medicine.

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**Appendix A:** Questionnaire to measure students' interest in Kampo medicine Before the lectures

The purpose of this questionnaire is not to test or evaluate your personal knowledge of Kampo medicine. The results of the questionnaire will be used solely as references and for reviewing the Kampo education program in the future through presentations at academic society meetings and for no other purposes. Confidential information will not be disclosed, and your privacy will be protected. You will not be disadvantaged even if you do not consent to respond to this questionnaire.

- 1) What is your general impression of Kampo medicine?
  1. Very good
  2. Slightly good
  3. Neither good nor bad
  4. Not very good
  5. Not good at all
  
- 2) Are you interested in Kampo medicine?
  1. Very interested
  2. Slightly interested
  3. Hardly interested
  4. Not interested at all
  
- 3) Would you prescribe Kampo formulas in the future after you have become a practicing physician?
  1. Would mainly prescribe Kampo medicine
  2. Would mainly practice Western medicine and actively incorporate Kampo medicine
  3. Would mainly practice Western medicine and partly incorporate Kampo medicine
  4. No intention of using Kampo formulas
  5. Do not know
  
- 4) Do you think practical experience of Kampo medicine is necessary for medical students?
  1. All medical students should experience Kampo medicine as a required subject.
  2. Need not be a required subject if Kampo medicine is available to all those who wish to study it.
  3. Sufficient as an elective subject that can be taken by about a quarter of the students (30 students).
  4. Kampo medicine is a subject to be studied on one's own therefore need not be included in the medical curriculum.

**Appendix B:** Questionnaire to measure students' interest in Kampo medicine After the EBL sessions

The purpose of this questionnaire is not to test or evaluate your personal knowledge of Kampo medicine. The results of the questionnaire will be used solely as references and for reviewing the Kampo education program in the future through presentations at academic society meetings and for no other purposes. Confidential information will not be disclosed, and your privacy will be protected. You will not be disadvantaged even if you do not consent to respond to this questionnaire.

- 1) What is your general impression of Kampo medicine?
  1. Very good
  2. Slightly good
  3. Neither good nor bad
  4. Not very good
  5. Not good at all
  
- 2) Are you interested in Kampo medicine?
  1. Very interested
  2. Slightly interested
  3. Hardly interested
  4. Not interested at all
  
- 3) Would you prescribe Kampo formulas in the future when you have become a practicing physician?
  1. Would mainly prescribe Kampo medicine
  2. Would mainly practice Western medicine and actively incorporate Kampo medicine
  3. Would mainly practice Western medicine and partly incorporate Kampo medicine
  4. No intention of using Kampo formulas
  5. Do not know
  
- 4) Were the clinical lectures before the EBL sessions helpful to understand the contents of the training?
  1. Very helpful
  2. Slightly helpful
  3. Hardly helpful
  4. Not at all helpful
  
- 5) Do you think that a lecture series and EBL sessions would be useful as a beginning for the continuing study of Kampo medicine after you have become a practicing physician?
  1. Very useful
  2. Slightly useful
  3. Hardly useful
  4. Not at all useful
  
- 6) Do you think practical experience of Kampo medicine is necessary for medical students?
  1. All medical students should experience Kampo medicine as a required subject.
  2. Need not be a required subject if Kampo medicine is available to all those who wish to study it.
  3. Sufficient as an elective subject that can be taken by about a quarter of the students (30 students).
  4. Kampo medicine is a subject to be studied on one's own therefore need not be included in the medical curriculum.