

# Questionnaire-Based Development of an Educational Program of Traditional Japanese Kampo Medicine

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Traditional Japanese Kampo medicine has been widely used in clinical practice in Japan. Though it is a compulsory subject in Japanese medical schools, a standard educational program in Kampo medicine does not exist. Tohoku University has incorporated Kampo medicine into clinical education via didactic lectures since 2003; however, student evaluations have been lower for Kampo than for all other clinical specialties. We administered a questionnaire about a Kampo medicine course for fifth-year students from 2009 to 2012 and developed an educational program based on feedback obtained. The questionnaire consisted of nine questions (a clear training plan; opportunities for learning, practice, and patient contact; acquisition of medical knowledge and physical examination; learning professionalism; understanding the specialty; overall assessment) that were rated on a 5-point Likert scale along with open-ended questions about the course's strengths and weaknesses. The students responded to the questionnaire after clinical practice in Kampo medicine and other clinical specialty courses. Scores for Kampo medicine and the average of other clinical specialties were compared. All 389 students who participated in Kampo clinical practice answered the questionnaire. In 2009, scores for Kampo medicine for nine questions were lower than for the average of the other clinical specialties. After curriculum reformation involving hands-on training in 2012, all scores except "opportunities to learn about clinical cases" and "opportunities to practice involvement" were higher than the average of all other clinical specialties. In conclusion, we have successfully developed a Kampo medicine educational program for our university through this survey study.

**Keywords:** education; Japan; Kampo medicine; perception; program

Tohoku J. Exp. Med., 2016 October, 240 (2), 123-130. © 2016 Tohoku University Medical Press

## Introduction

Traditional Japanese medicine, known as Kampo medicine, originated in China and was imported to Japan in the 5th and 6th centuries (Kosoto 2003). Over time, original Chinese medicine had been modified and developed as "Kampo," which means "Chinese manner or methods" in Japanese, and was the only medicine in Japan until the middle of 19th century. Based on the original concept, Kampo was applied to numerous diseases using its own physical examination system. Kampo medicine examines three major domains including "qi" (vital energy), "blood," and

"fluid." Additionally, important components of the original physical examination include "tongue diagnosis," "pulse diagnosis," and "abdominal diagnosis." Knowledge about these diagnostic and treatment approaches has been handed down to doctors over a long period. However, after the restoration of Imperial rule in 1867, the Japanese government adopted Western medicine as Japan's primary form of medicine. Subsequently, the Japanese government eliminated Kampo from medical education in 1883, and Kampo has not been taught in Japanese medical schools for over 100 years (Imazu et al. 2012). On the other hand, Kampo formulae known as Kampo extract preparations were permit-

Received June 30, 2016; revised and accepted September 14, 2016. Published online September 28, 2016; doi: 10.1620/tjem.240.123.

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ted by Japanese insurance policies in 1972. As a result, Japanese doctors could use Kampo formulae as basic prescriptions that were covered by national Japanese government health insurance (Imazu et al. 2012). In addition to the quality of the medicines, Kampo extract preparations have advantages such as transportability, ease of preparation, and suitability for conservation (Akiba 2010). Furthermore, a substantial amount of evidence about the efficacy of Kampo extract preparations has recently accumulated (Iwasaki et al. 2005; Kubo and Nishimura 2007; Tatsumi et al. 2009; Mukaida et al. 2011; Nabeshima et al. 2012; Numata et al. 2014a, b). A recent investigation of the use of Kampo in Japan reported that over 80% of Japanese doctors used Kampo preparations (Imanishi et al. 1999; Suzuki 2004), suggesting the importance of Kampo medicine in patient treatment. However, another study reported that only 8% of Japanese medical schools included Kampo medicine in their curricula in 1987 (Yakazu et al. 1987) and 26% in 1997 (Kawagoe et al. 2000). These circumstances

indicate that Kampo medical education has not met the necessary requirements for Japanese clinical settings.

Based on the history of Kampo education and the current status of Kampo preparation use, the need for Kampo medical education in Japan has been highlighted. In 2001, the Japanese Ministry of Education, Culture, Sports, Science and Technology revised Japanese medical education to include Kampo as an essential part of the curriculum (Ministry of Education, Culture, Sports, Science and Technology-Japan 2001). Consequently, by 2007, Kampo medicine was incorporated into medical education in all 80 Japanese medical schools (Sato 2008). However, there has never been a standard educational program for Kampo medicine.

Studies from Japanese medical schools report that lectures or training about Kampo medicine could improve students' understanding (Nakano et al. 1996; Asaoka 2000; Imanishi et al. 2002; Yamamoto and Yoshida 2002; Itoh et al. 2011; Iizuka et al. 2012). However, there is no standard

Table 1. Kampo medicine curriculum.

2009 to 2011	<p><b>Third and fourth years</b></p> <p>Lectures (one hour each)</p> <ol style="list-style-type: none"> <li>1. Basic pharmacology</li> <li>2. Kampo formulae</li> <li>3. History and concept of Kampo medicine</li> <li>4. Qi concept and abnormalities</li> <li>5. Blood concept and abnormalities</li> <li>6. Water concept and abnormalities</li> <li>7. Kampo treatment based on evidence-based medicine for elderly patients</li> </ol> <p><b>Fifth year (one-day clinical practice)</b></p> <p>Clinical attachment (one day)</p> <p>Lectures (one hour each)</p> <ol style="list-style-type: none"> <li>1. Concept of Kampo medicine</li> <li>2. Evidence for acupuncture</li> </ol> <p>Practice (one hour each)</p> <ol style="list-style-type: none"> <li>1. Student decoction of Kampo formulae</li> <li>2. Students practice acupuncture on each other</li> </ol>
2012 to present	<p><b>Third and fourth years</b></p> <p>Lectures: same contents as 2009–2011</p> <p><b>Fifth year (one-day clinical practice)</b></p> <p>Lectures (one hour each)</p> <ol style="list-style-type: none"> <li>1. Usage of Kampo preparations in current clinical settings</li> <li>2. Evidence for acupuncture</li> </ol> <p>Practice (one hour each)</p> <ol style="list-style-type: none"> <li>1. Students practice decoction of Kampo formulae</li> <li>2. Students practice acupuncture on each other</li> <li>3. Students practice Kampo medicine physical examinations on each other (tongue diagnosis, pulse diagnosis, and abdominal diagnosis)</li> <li>4. Students participate by taking a new patient's history and conducting a physical examination</li> </ol>

Sixth-year students can choose Kampo clinical attachment as an elective course.

curriculum for Kampo medicine in terms of content, time allocated, and style (Sato 2004). Thus, learner input is necessary to develop a standard Kampo education curriculum. The diagnostic procedure of Kampo medicine is different from that of Western medicine, and therefore, it is important to understand the whole process of Kampo treatment. Our university has incorporated Kampo medicine into clinical education via didactic lectures since 2003; however, student evaluations have been lower for Kampo than for all other clinical specialties. To understand the whole process of Kampo treatment, it is important to introduce holistic education, such as hands-on training, rather than didactic lectures.

In this study, we administered a questionnaire assessing the perceptions of medical students in Kampo medicine, and developed an educational program based on responses to the questionnaire.

## Methods

### *Kampo curriculum*

Our university introduced Kampo medicine into its curriculum in 2003. The curriculum consists of a total of seven hours of preclinical lectures for third- and fourth-year students, and one day of clinical practice in the fifth year. The fifth year of the Kampo clinical curriculum was originally passive and lecture-based. However, in 2011 it was reformed to be more active by incorporating hands-on training. This practical training included using Kampo to record patients' histories and conduct physical examinations, and this change was implemented in 2012 (Table 1). Since 2009, three university doctors who

are board-certified by the Japan Society of Oriental Medicine have been responsible for administering all Kampo medicine-related lectures and clinical training.

### *Course evaluation*

A total of 389 fifth-year students (328 males, 61 females) had completed Kampo clinical practice between 2009 and 2012. To obtain students' evaluations and comments regarding clinical attachment courses, the university provided a common evaluation form. The form consisted of nine questions that were rated on a 5-point Likert scale as well as space to answer open-ended questions about the course's strengths and areas for improvement (Table 2). This evaluation form was used to evaluate both the Kampo medicine course as well as all other clinical attachment courses (e.g., internal medicine, surgery, pediatrics). Students filled out the evaluation form at the end of each course and submitted it to the office of medical education (OME). The OME semiannually compiled all evaluation data and returned it to each clinical department. Information that could lead to student identification was excluded. For each of the nine questions, we compared the average Kampo medicine course scores with those from all other specialty courses before and after Kampo curriculum reformation.

### *Qualitative analysis of students' written comments*

We performed a thematic analysis of students' written responses to open-ended questions about the Kampo curriculum. Three researchers from this study (ST, SI, and FT) first read the comments and then independently analyzed the data to extract themes. Subsequently, the three researchers compared the results of their analyses and reached approximately 70% agreement in data interpreta-

Table 2. Fifth-year students' evaluation of small group training courses.  
Nine questions rated on a five-point Likert scale

	5: strongly agree	4: agree	3: neither agree nor disagree	2: disagree	1: strongly disagree		
Q1: statement of a clear training plan	(	5	4	3	2	1	)
Q2: opportunities to learn about clinical cases	(	5	4	3	2	1	)
Q3: acquisition of medical knowledge	(	5	4	3	2	1	)
Q4: learning professionalism from physicians	(	5	4	3	2	1	)
Q5: understanding the Kampo specialty	(	5	4	3	2	1	)
Q6: opportunities to practice involvement	(	5	4	3	2	1	)
Q7: opportunities for patient contact	(	5	4	3	2	1	)
Q8: acquisition of physical examination skills	(	5	4	3	2	1	)
Q9: overall assessment	(	5	4	3	2	1	)
<u>Open-ended questions</u>							
1) What are the strengths of this course?							
2) What areas of this course could be improved?							
3) What impressive events have you have experienced in this course?							

Table 3. Comparisons of students' evaluations of the nine questions about the Kampo course in 2009, 2010, and 2012.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Average
	4.00	3.00	4.00	3.00	4.00	3.00	2.00	3.00	3.00	3.22
<b>2009</b>	(3.00– 5.00)	(2.00– 3.00)	(3.00– 4.00)	(3.00– 4.00)	(3.00– 5.00)	(2.00– 3.00)	(1.00– 3.00)	(3.00– 4.00)	(3.00– 4.00)	(2.89– 3.67)
	4.00	3.00*	4.00	4.00	4.00	3.00*	3.00*	3.00	4.00	3.56*
<b>2010</b>	(4.00– 5.00)	(3.00– 4.00)	(3.00– 5.00)	(3.00– 4.50)	(4.00– 5.00)	(3.00– 4.00)	(2.00– 4.00)	(3.00– 4.00)	(3.00– 4.00)	(3.11– 4.00)
	5.00* **	4.00* **	5.00* **	5.00* **	5.00* **	4.00* **	4.00* **	4.00* **	5.00* **	4.33* **
<b>2012</b>	(4.00– 5.00)	(3.00– 5.00)	(4.00– 5.00)	(4.00– 5.00)	(4.00– 5.00)	(3.00– 5.00)	(3.00– 5.00)	(4.00– 5.00)	(4.00– 5.00)	(3.89– 4.94)

Values indicate the median and 25th and 75th percentiles.

\*Significant difference compared to 2009.

\*\*Significant difference compared to 2010.

tion. The researchers iteratively reread the comments, discussed the themes again, and reached final agreement about key themes that emerged from the comments.

#### Statistical analysis

Each year multiple Kruskal-Wallis and Steel-Dwass tests were conducted to evaluate comparisons of students' evaluations of the Kampo medicine course (Table 3). The significance level was set at less than 5%.

#### Ethical considerations

The study procedures adhered to the tenets of the Declaration of Helsinki in its revised version of 1975 and its amendments of 1983, 1989, and 1996, and were approved by the Institutional Review Board of our university (No. 2013-1-242). The Office of Medical Education to OME, Tohoku University School of Medicine, obtained comprehensive agreement from students.

## Results

#### Students' Kampo practice

Fig. 1 shows the fifth-year students' Kampo medicine clinical attachment practice, which consists of decoction of Kampo formulae (Fig. 1A), Kampo physical examinations (tongue diagnosis, pulse diagnosis, and abdominal diagnosis) (Fig. 1B), acupuncture (Fig. 1C), and taking patients' histories and conducting a physical examination (Fig. 1D).

#### Students' course evaluations

Fifth-year students' response rate for the Kampo medicine course was 100%, and ranged from 98% to 100% for other clinical specialties that they attended during the observation period. Fig. 2 shows the results of students' course evaluations before (Fig. 2A, B) and after (Fig. 2C) the curriculum reformation of the Kampo clinical course. Evaluation scores for Kampo clinical attachment for all the questions except question 1 ("statement of a clear training plan") were remarkably lower than average scores for all

clinics in 2009 and 2010. However, there was marginal improvement in scores for "opportunities to learn about clinical cases," "opportunities to practice involvement," and "opportunities for patient contact" in 2010 (Fig. 2A, B). After the 2012 curriculum reformation, students' evaluation of the Kampo course dramatically improved for all nine questions, and the mean score was identical to the average score for all clinics (Fig. 2C). Specifically, the mean score for all questions about the Kampo course improved from 3.3 in 2009 to 4.3 in 2012 (Fig. 2A, C). It is notable that the mean scores for all clinics showed continuous improvement, with scores of 3.8, 4.0, and 4.3 for 2009, 2010, and 2012, respectively (Fig. 2A-C). Statistical analysis showed that students' evaluation of the 2012 Kampo course significantly improved for all questions compared with those in 2009 and 2010 ( $p < 0.05$  for all nine questions) (Table 3). The major reasons for the differences between the Kampo medical clinic and all other clinical specialties were lack of opportunities to practice and contact with patients. These points were improved through the introduction of hands-on training in clinical practice as part of the curriculum reformation based on feedback from the questionnaire. Unfortunately, academic testing with respect to Kampo medicine was not performed during this period among fifth-grade students. Therefore, we cannot show improvement in understanding of Kampo medicine for students.

#### Thematic analysis of students' comments

Thematic analysis of students' comments in 2009 and 2010 revealed that a major weakness of Kampo clinical attachment was "no opportunity to visit clinics." In contrast, in 2012, the major strengths of the program were "decoction of Kampo formulae and opportunity to try acupuncture" and "comprehensive understanding of Kampo medicine."

A.



B.



C.



D.



Fig. 1. Methods of hands-on teaching.

A. Kampo medicine formulae decoction training. B. Kampo medicine physical examination training. C. Acupuncture training. D. Participation in practice.

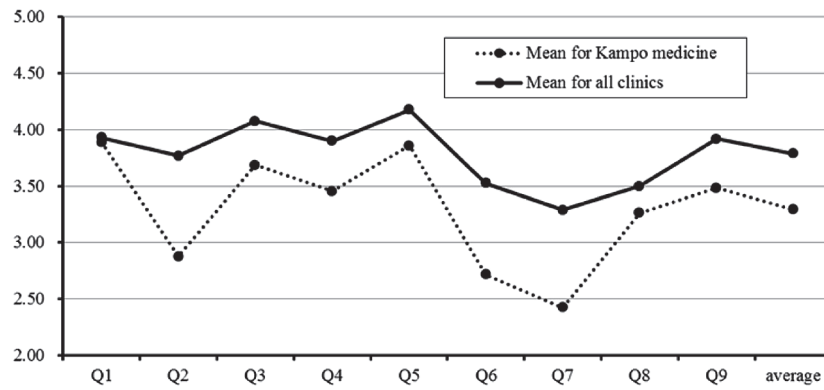
### Discussion

In this report, we introduced the reformation of Kampo medical education at our university based on students' opinions about Kampo clinical education over a four-year period.

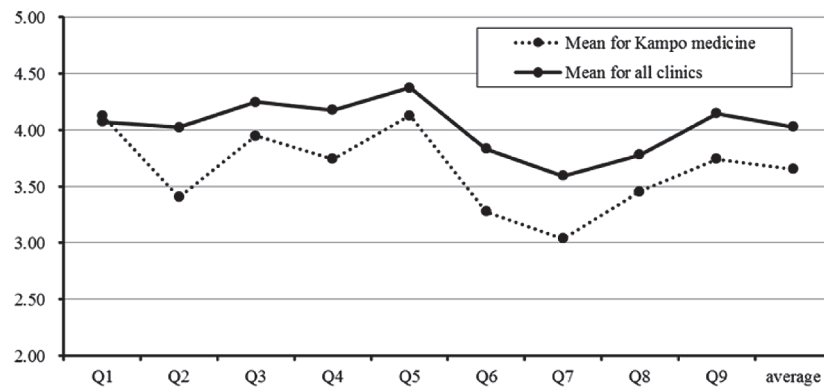
Students' assessment scores for Kampo clinical education at the inception of this program in 2009 were low compared to the average scores for other clinical courses. The scores for three questions, "opportunities to learn about

clinical cases," "opportunities to practice involvement," and "opportunities for patient contact" were particularly lower than the average. Thematic analysis of students' comments in 2009 revealed that the major weakness of Kampo clinical education was "no opportunity to visit clinics." Based on these results, we restructured the program by increasing opportunities for clinic visits, which resulted in minor improvements in the scores for "opportunities to learn about clinical cases," "opportunities to practice involvement," and "opportunity for patient contact" in 2010, although the

A.



B.



C.

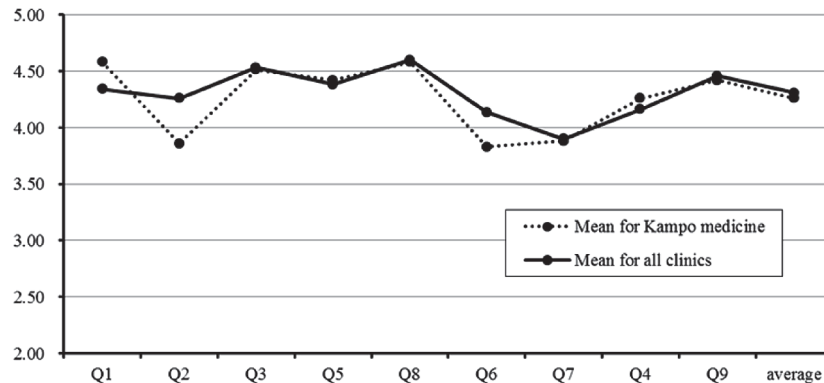


Fig. 2. Scores by students' evaluation of Kampo medicine. A. Results of questionnaire comparing 2009 Kampo medicine clinic with all clinics. B. Results of questionnaire comparing 2010 Kampo medicine clinic with all clinics. C. Results of questionnaire comparing 2012 Kampo medicine clinic with all clinics.

mean score of all nine questions remained unsatisfactory. In 2012, we again restructured the Kampo curriculum by incorporating more hands-on experiences for students such

as conducting Kampo medical interviews and physical examinations. This major curriculum reformation yielded a significant improvement in students' assessment scores for

“statement of clear training plan,” “opportunities to learn about clinical cases,” and “opportunities to practice involvement” in 2012, and the mean score became consistent with the average for all other clinical courses. In course evaluations, some 2012 students commented, “I hope for more detailed learning about Kampo” and “I would like more time to learn Kampo.” We had not seen these affirmative comments demonstrating students’ motivation to learn about Kampo medicine before 2012, and we assume that the introduction of hands-on experience with Kampo worked effectively to increase students’ interest in this specialized area. Thematic analysis indicated that, “training of Kampo decoction and acupuncture” and “comprehensive understanding of Kampo medicine” were the strengths of Kampo clinical education. These results suggest that combination of knowledge and skills domains imparted a synergistic effect to the new 2012 Kampo curriculum.

In Japan, the number of compulsory Kampo-related classes during the six years of medical school have been reported to range between 0 and 25, with a median of 6 classes (Arai et al. 2012). In the 2011 survey of Arai et al. (2012), two universities reported no Kampo classes in the curriculum; one university was on the road to a new curriculum, while in the other university, Kampo was offered in liberal arts and science courses. Accordingly, Kampo medicine was incorporated into the medical curriculum at the 78 medical schools (98% of the 80 medical schools) in 2011. This seems to contradict the Sato’s report (Sato 2008), as described in Introduction; however, the situation of medical education changes each year. The number of Kampo classes with over 8 class meetings made up 44%, practical training made up 21%, and clinical clerkship made up 26% in Japanese medical schools with a class meeting ranging from 45 to 100 minutes. The reformed curriculum of Kampo medicine shown in this study included 2 hours of lecture and 4 hours of practice in fifth-year students. In Tohoku university, 7 hours of compulsory Kampo lectures were also conducted for third- and fourth-year students. In total, students can receive 13 hours of lecture and practice in the reformed curriculum. Furthermore, sixth-year students can select an additional elective clinical clerkship for a month in Kampo medicine. These show that the complete educational program of our university in Kampo medicine incorporated many classes with lectures, hands-on training, and clinical practice, compared with other universities.

Recently, the Japan Geriatric Society published “Guidelines for Medical Treatment and its Safety in the Elderly,” which includes Kampo medicine (Takayama and Iwasaki 2016; Kojima et al. 2016). As such, appropriate administration of Kampo medicine will be widely spread in general medicine. Furthermore, the World Federation for Medical Education Global Standards for Quality Improvement evaluates the education of complementary and alternative medicine, including traditional medicine in each university of Japan (Kitamura et al. 2015). With

respect to Kampo medical education in particular, further qualitative and quantitative evaluation is needed.

There are a number of limitations to this study. First, department educators conducted the survey. Moreover, the evaluations were limited in terms of how questionnaires scores were compared before and after training. Specifically, continuous evaluation and feedback about Kampo medical education over a period of years has not yet been reported. However, the questionnaire for all clinics was conducted by the OME and included complete coding of all student responses. As a result, it can determine students’ true perceptions. Consequently, we can gain useful feedback through between-clinic content comparisons. Additionally, this is the first report to evaluate and gather feedback about students’ perceptions regarding Kampo medical education.

Since 2001, Kampo medical education has been introduced into the medical education model for the core curriculum in Japan. However, the education program is currently based on trial and error. We investigated medical students’ perceptions of the Kampo medicine course and have successfully developed an educational program based on feedback obtained.

### Acknowledgments

This study was supported by our university’s administration fund. We thank all students who responded to our questionnaire.

### Authors Contributions

Shin Takayama participated in planning the study, performed Kampo medicine education, and wrote the manuscript. Takehiro Numata, Akiko Kikuchi, Soichiro Kaneko, Tetsuharu Kamiya, Hitoshi Nishikawa, Yuka Ikeno, and Takashi Takeda participated in study planning and Kampo medicine education. Natsumi Saito, Ryutaro Arita, Minoru Ohsawa, Junichi Tanaka, Hitoshi Kuroda, and Michiaki Abe supported the preparation of the manuscript. Seiichi Ishii and Fumie Takahashi conducted qualitative and quantitative data collection and analyses. Nobuo Yaegashi and Tadashi Ishii were responsible for study design and execution as well as assisting in writing the manuscript. All authors read and approved the final manuscript.

### Conflict of Interest

We declare no conflict of interest. However, Shin Takayama, Nobuo Yaegashi, and Tadashi Ishii received grants from TSUMURA (pharmaceutical company), outside the submitted work. Takashi Takeda received grants from TSUMURA (pharmaceutical company), BAYER (pharmaceutical company), and OTSUKA (pharmaceutical company), outside the submitted work. Minoru Ohsawa received a lecture fee from TSUMURA, outside the submitted work.

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