

Survey of Problems in Kampo Curriculum and the Need for Interdisciplinary Collaboration Education in Japanese Medical, Pharmacy, Dental, and Nursing Departments

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Highlights

- Interdisciplinary collaboration is required in Kampo curriculum.
- Medical, dental, and nursing departments have problems with a lack of instructors and the number of curriculum hours.
- Universities offering Kampo medicine curriculum require collaboration with medical and pharmacy departments.

Abstract

In recent years, there has been a lot of research on the effectiveness of Kampo medicine. New findings from modern medicine are also being delivered in addition to traditional education in Japanese University. Kampo treatment covers a wide range of disorders. To achieve multidisciplinary cooperation in Kampo treatment, it is necessary to have an education system in which pharmacy, nursing, medicine and dentistry collaborate. The purpose of this study was to investigate the current status of Kampo classes in Japanese universities to clarify the problems experienced by each department and the needs for a system of interdisciplinary collaboration, and to examine what a new curriculum should encompass. We conducted a questionnaire survey of the Kampo curriculum at all medical, pharmaceutical, dental and nursing schools at universities in Japan. The target respondents were faculty members and administrators in charge of Kampo lectures. Multivariate analysis and correspondence analysis were conducted for multiple response items. Fisher's exact test and Cochran's Q test were used to compare response frequency among departments and desired collaborators in each faculty, respectively. The results showed that the lack of instructors and the number of hours in the curriculum were problems in the departments of medicine, dentistry, and nursing. Medical, nursing, and dental departments cited the lack of time in their curriculum as a problem. The departments of medicine and pharmacy wished to further incorporate experiential learning (active learning) and problem-based learning/tutorial teaching methods. Incorporating an interdisciplinary collaboration system in the Kampo curriculum was required by a large percentage of respondents from all four academic departments. We identified trends in the problems and needs of each individual department, and this has given us direction for the development of Kampo curriculum in the future. Based on these findings, a new curriculum that includes interdisciplinary collaboration is required.

Keywords

Interdisciplinary collaboration education, Kampo education, core curriculum, Kampo medicine, questionnaire survey, medicine, dentistry, pharmacy, nursing

1. Introduction

In recent years, there has been a growing global demand for traditional medicine (TM) and complementary and alternative medicine (CAM), including herbal medicine (Stratton et al., 2007). The Revision of the International Classification of Diseases (ICD) was approved at the 72nd World Health Assembly in May 2019, and a new chapter on traditional medicine, Supplementary Chapter Traditional Medicine Conditions--Module I, was added. Kampo is a Japanese traditional medicine that is classified in the International Classification of Diseases 11th Revision (ICD-11) (World Health Organization, 2018). In recent years, there also has been a lot of research on the effectiveness of Kampo medicine (Fujitsuka et al., 2016; Uto et al., 2018). Animal studies have shown that Kampo medicines that improve debilitating conditions can help improve sarcopenia and cachexia (Ohsawa et al., 2021). Kampo medicines such as Ninjin'yoeito and Rikkunshito stimulate ghrelin-neuropeptide Y orexigenic axis, thereby improving appetite and sarcopenia (Uto et al., 2018). These new findings from modern medicine are also being delivered in addition to traditional education in Japanese University. In Japan, unlike China, medical education is centralized, which allows doctors to prescribe both Western and Kampo medicine (Gao et al., 2012). In a 2011 survey, 89% of Japanese doctors prescribed Kampo medicine (Japan Kampo Medicines Manufacturers Association, 2011), and dentists also use Kampo medicine for treatment (Wang and Kaneko, 2018). Kampo medicines are widely used in the Japanese healthcare system.

Kampo treatment covers a wide range of disorders including autonomic dysfunction, depression, infertility, dysmenorrhea, glossalgia, atypical facial pain, eating disorders, functional gastrointestinal disorders, tinnitus, and vertigo. At university hospitals with Kampo treatment centers, diseases that are difficult for individual departments to treat alone are examined through interdisciplinary cooperation (Amitani et al., 2016). The combined use of Ninjin'yoeito and rehabilitation therapy has been shown not only to improve dizziness, but also frailty (Arai, 2021). There is a growing need for multidisciplinary cooperation in Kampo treatment.

In Japanese medical, pharmaceutical, dental, and nursing education, the Model Core Curriculum, which is an educational attainment goal created by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), specifies Kampo medicine, team medicine, and collaboration with multiple professions (Medical Education Model Core Curriculum Coordination Committee, 2016; The Pharmaceutical Society of Japan, 2015; Model Core Curriculum Revision Coordination Committee, 2016; Committee for Fostering Human Resources in Nursing Education, 2017). Interdisciplinary education has been attracting attention around the world (Cooper et al., 2001) and interdisciplinary collaboration has become an inseparable part of Kampo education. Some universities have asked lecturers from other fields to give lectures on Kampo curriculum at undergraduate schools for contents that are insufficiently covered by lecturers in their own field (Nakada and Arai, 2018; Nogami et al., 2021). In our previous research,

we did not find any papers on the interdisciplinary collaboration system in Kampo medicine curriculum.

The purpose of this study was to investigate the current status of Kampo classes in medical, pharmacy, dentistry, and nursing departments nationwide, to clarify the problems each department has in Kampo classes and the needs for a system of interdisciplinary collaboration, and to examine what a new curriculum should encompass.

2. MATERIALS AND METHODS

2.1. Study sample and data collection

The questionnaire was sent by mail and email to all medical (82 schools), pharmacy (84 schools), dental (29 schools), and nursing (277 schools) schools at universities in Japan between August 2019 and July 2021. Respondents were instructors in charge of classes or those in charge of teaching affairs at each university. This study was reviewed by the Ethics Committee for Epidemiological Studies at Kagoshima University, and was determined not to be subject to ethical review. This study conformed to the principles of the Helsinki Declaration.

2.2. Questionnaire survey

The contents of the questionnaire on Kampo curriculum were as follows: (1) number of Kampo classes (compulsory, elective) and minutes per class; (2) number of Kampo classes on campus, off campus, and by instructor's specialty; (3) content of Kampo curriculum currently offered; (4) Kampo curriculum teaching strategy currently offered; (5) content of curriculum desired to be introduced in the future; (6) Kampo curriculum teaching strategies desired to be introduced in the future; (7) problems encountered in implementing the Kampo curriculum; (8) existence of current interdisciplinary collaboration system and collaborators; (9) whether you feel the need for interdisciplinary collaboration; (10) preferred collaborators; and (11) desired content of collaboration.

2.3. Data analysis

Multivariate analysis is necessary for data with multiple response items; we conducted a correspondence analysis (van Dam et al., 2021). Fisher's exact test was used to compare response frequency among departments. The Cochran's Q test was used for paired data to compare the frequency of responses of the desired collaborators in each faculty. Data were analyzed using R software, version 4.0.3.

3. RESULTS

The status of the Kampo curriculum in each department and whether or not they wished to

collaborate with departments at other Japanese universities are presented in Table 1.

3.1. Content of classes currently being offered in Kampo curriculum

The content of classes currently being offered in the Kampo curriculum is shown in Table 2. Statistically significant differences in curriculum implementation rates were found among the faculties, except for conceptual differences with Western medicine, drug prices, acupuncture and moxibustion. Distributional evaluation showed that in the department of pharmaceutical sciences, implementation of the items in the curriculum was generally higher than in other departments, especially the implementation of crude drugs. The implementation rate of the items on clinical experience by medical specialists was low in the pharmacy and dentistry departments, and high in the medicine department. In the department of nursing, the overall implementation rate was low.

3.2. Teaching strategies currently implemented in Kampo curriculum

Figure 1 shows the relationship among the teaching methods currently being implemented in the Kampo curriculum. On the axis of dimension 1, where the contribution rate is high (72.5%), it was shown that teaching methods could be divided into two groups: nursing/dentistry and pharmacy/medicine. Hands-on practice/learning, case studies, flipped classrooms, and tutorials/problem-based learning (PBL) tended to be implemented in the departments of medicine and pharmacy more than in the departments of dentistry and nursing. In addition, lectures tended to be given priority in the dental and nursing departments.

3.3. Problems that each university encountered in implementing Kampo curriculum

The relationship among problems that each university encountered in implementing the Kampo curriculum is shown in Figure 2. On the axis of dimension 1, where the contribution rate is high (76.9%), it was shown that the problems could be divided into two groups: nursing/pharmacy and medicine/dentistry. A lack of instructors tended to be a problem in the departments of medicine and nursing, with a particularly strong tendency for this problem in the department of medicine. Both the medical and nursing departments tended to see the lack of teaching materials as a problem. The departments of medicine and nursing tended to cite the inability to secure enough hours in the curriculum as a problem, with a particularly strong tendency in the school of nursing. In addition, students in the department of pharmaceutical sciences tended to indicate that there were no problems more than other departments. The department of dentistry tended to be more concerned about the lack of instructors, the inability to secure enough hours, and the lack of teaching materials in the curriculum more than the department of pharmacy.

3.4. Content of classes that are not currently offered that departments hope to introduce into the curriculum in the future

Figure 3 shows the relationship among the content of classes that are not currently offered that departments hope to introduce into the curriculum in the future. The contribution was 60.3% on the first axis (dimension 1) and 35.5% on the second axis (dimension 2), indicating a two-dimensional distribution. It is suggested that nursing is characterized on the first axis and medicine is characterized on the second axis. The nursing department tended to want to incorporate basic theories, differences from Western medicine, how patients should take Kampo medicine, and side effects into the curriculum. The medical department tended to want to incorporate how to decoct Kampo medicines, therapy in accordance with oriental medical syndromes, drug prices, and crude drugs into the Kampo curriculum. There was a tendency in the dentistry department, and particularly in the department of pharmacy, to want to incorporate the clinical experience of specialists into the Kampo curriculum.

3.5. Teaching strategies that are not currently being implemented, but that departments would like to incorporate in the future

The relationship among the teaching strategies that are not currently being implemented, but that departments would like to incorporate in the future is shown in Figure 4. On the axis of dimension 1, where the contribution rate is high (70.8%), it was shown that teaching strategies could be divided into two groups: nursing/dentistry and pharmacy/medicine. Medical and pharmaceutical sciences departments tended to want to incorporate types of class methods in which students are actively involved, such as tutorials/PBL and hands-on practice/learning, into their curricula. In addition, the department of dentistry tended to want to incorporate case studies into the curriculum. The nursing department tended to want to implement lectures.

3.6. Interdisciplinary collaboration system in schools that are implementing Kampo curriculum

Table 3 shows the percentage of departments that are currently collaborating in the Kampo curriculum, as well as the percentage of departments that wish to collaborate in the future. The results of Cochran's Q test in each department showed that there was a difference in the frequency of departments that wanted to collaborate. A large percentage of respondents in the departments of medicine, dentistry, and nursing wanted to collaborate with the department of pharmacy. A large percentage of students in the departments of pharmacy, dentistry, and nursing were seeking collaboration with the department of medicine.

3.7. Departments that wish to collaborate in the Kampo curriculum

Figure 5 shows the relationship among the departments that wish to collaborate in the Kampo curriculum. The contribution was 62.7% on the first axis (dimension 1) and 28.7% on the second axis (dimension 2), indicating a two-dimensional distribution. The departments of medicine, dentistry, and nursing wished to collaborate with the department of pharmacy. The departments of pharmacy, dentistry, and nursing wished to collaborate with the department of medicine. In addition, the department of medicine wished to collaborate with the department of nursing.

3.8. Interdisciplinary collaboration system in schools that are implementing Kampo curriculum

Table 4 shows the requests each department had for collaborators. The cooperation of the instructor in charge of classes was highest request in each field. The items for which there was a statistically significant difference in the frequency of requests in each department were an instructor in class and guidance on crude drugs. Requests for an instructor in class were more frequent in the nursing and pharmacy departments than in the departments of medicine and dentistry. In addition, requests for guidance on crude drugs and medication were higher in the medical and dental departments than in the department of pharmacy.

3.9. Tendency of desired collaborators and desired contents of collaboration

Figure 6-a shows the collaboration that medical schools seek from each department. Medical departments tend to seek lecturers in charge of classes, consultation on curriculum development, and guidance on crude drugs from the faculties of pharmacy and dentistry. The department of medicine tended to want to collaborate with nursing departments to provide medication guidance.

Figure 6-b shows the tendency of desired collaborators and desired contents of collaboration by the department of pharmacy. Pharmacy departments tended to seek lecturers in charge of classes from the department of medicine.

Figure 6-c shows the tendency of desired collaborators and desired contents of collaboration by the department of dentistry. The department of dentistry tended to seek lecturers in charge of classes, consultation on curriculum development, how to take Kampo medicine, and guidance on crude drugs from the faculties of pharmacy and medicine.

Figure 6-d shows the tendency of desired collaborators and desired contents of collaboration by the department of nursing. The department of nursing tended to seek lecturers in charge of classes, how to take Kampo medicine, and guidance on crude drugs from the faculties of pharmacy and the medicine.

4. Discussion

We identified trends in what each academic department is looking for in what areas, and this has given us some direction for the development of Kampo curriculum in the future. To the best

of our knowledge, this is the first study to identify such trends.

The call for interdisciplinary education and practice permeates most academic venues and is supported by many policy initiatives around the world (Resnick, 2015). Currently, interdisciplinary education is being implemented in medical colleges globally (Hall and Weaver, 2001). In order to educate students about Kampo, it is important to understand the pharmacological mechanisms of Kampo, as well as how to take Kampo medicine, as it is composed of several crude drugs. In addition, Kampo medicine is used clinically not only by doctors but also by dentists. Therefore, it is necessary to have an educational system in which pharmacy, nursing, medicine, and dentistry collaborate, which will also be useful for future multi-professional collaboration regarding Kampo medicine. Incorporating an interdisciplinary collaboration system in the Kampo curriculum was required by a large percentage of respondents from the departments of medicine, pharmacy, dentistry, and nursing. Kampo medicine is composed of multiple crude drugs, and learning is not easy for students because of the difficult terminology and the complexity of examination methods and concepts (Nakada et al., 2018; Nakano et al., 2013). In addition, the training of instructors who have the correct knowledge of Kampo is also a problem (Nakada and Arai, 2018). In this study, it became clear that the lack of instructors was a problem in the departments of medicine, dentistry, and nursing, and that interdisciplinary collaboration is important.

There were many requests for collaboration and cooperation with the departments of medicine and pharmacy in the present study. The department of medicine has many clinical cases of Kampo administration (Akamaru et al., 2015; Oteki et al., 2016). In this study, the medical department had a high rate of clinical experience and case studies performed by medical specialists in their Kampo curriculum. In addition, clinical cases can be used for PBL, and simulators are used more often than in other departments. There is a report that the contents regarding clinical use of Kampo in the department of pharmacy curriculum is inadequate (Nakada and Arai, 2018), and that some pharmacy students have expressed a desire for clinical lectures such as case studies and drug interactions with Western drugs (Atsumi et al., 2015). In addition, the use of Kampo in the dental field is still low and clinical cases are scarce (Wang and Kaneko, 2018). The implementation rate of clinical experience by medical specialists in the curriculum was low in the departments of pharmacy, dentistry, and nursing in the present study. Since there were many requests for implementation in the future, it will be important to share clinical cases in collaboration with the department of medicine.

Our study showed many requests for collaboration with respect to the guidance on crude drugs and medication from the departments of medicine, dentistry, and nursing. Kampo medicines are made up of some crude drugs, and each crude drug has its own effects (Ataka et al., 2020). For physicians and dentists who are in a position to prescribe Kampo medicine, pharmacological

knowledge of the constituent crude drugs is necessary. The Model Core Curriculum for Medical Education explicitly states that students should be able to outline the pharmacological effects of Kampo medicines (Model Core Curriculum for Medical Education). The Model Core Curriculum for Dental Education also states the following in the section on pharmacological effects, “Understand basic information about the effects of drugs (including Kampo)” (Model Core Curriculum Revision Coordination Committee, 2016). Moreover, the Model Core Curriculum for Nursing Education states, “Explain the actions, mechanisms, indications, and adverse events of major Wakan-yaku (Kampo medicines)” (Committee for Fostering Human Resources in Nursing Education, 2017). Not only doctors, dentists, and pharmacists, but also nurses need to know about Kampo medicine so that they can judge and report the effects and adverse events of medication and treatment. In this survey, the department of pharmaceutical sciences had by far the highest number of hours for conducting Kampo classes, while most of the medical, nursing, and dental schools, in contrast, cited the lack of time in their curriculum as a problem. The department of pharmacy, which allows students to spend a certain amount of time learning about Kampo medicine, including pharmacognosy, medicinal botany, and pharmacology, has an advantage over other medical departments in understanding Kampo medicine (Homma, 2016; Matsuda, 2016; Nakada and Arai, 2018). It is important to utilize such knowledge in the department of pharmacy in collaborative education with the departments of medicine, dentistry, and nursing in the future.

Our study revealed that the departments of medicine and pharmacy wished to further incorporate experiential learning (active learning) and PBL/tutorial teaching methods, in which students can actually taste and smell Kampo medicines and experience the decoction of Kampo medicines. In Kampo education, learning the techniques and effects of Kampo through hands-on experience can increase learning efficiency and student motivation (Kinoue et al., 2020), which has been attracting attention in recent years. It has been reported that students in pharmacy schools hope to have experiential lectures in their classes (Atsumi et al., 2015). However, since PBL/tutorials and experiential learning require multiple instructors to teach students, it is difficult to implement them in schools that lack instructors, and it is important to establish a collaborative system.

The rate of implementation of Kampo curriculum is still low in the nursing department, while nearly 90% of doctors prescribe Kampo medicine (Japan Kampo Medicines Manufacturers Association, 2011). The number of schools implementing the Kampo curriculum in nursing departments has gradually increased when compared to the 2011-2012 data (Nakano, 2013). While the rate of implementation of Kampo curriculum in the department of nursing was 21.65%, 59.46% of the respondents answered that interdisciplinary collaboration is necessary for Kampo curriculum. Considering the fact that 85.71% of the nursing departments that are currently implementing Kampo curriculum have a collaboration system, it can be said that interdisciplinary

collaboration is required for the implementation of Kampo curriculum. In addition, the content of the current curriculum is almost exclusively lectures, but there were many requests for future Kampo curriculum. In this study, we found that the departments of medicine and nursing mutually desire interdisciplinary collaboration in the Kampo curriculum. By building a system of interdisciplinary collaboration in the future, it will be possible to cover a variety of teaching methods.

As a limitation of this study, we were not able to collect questionnaires from all universities. Therefore, the opinions of all universities are not reflected in this study. It is necessary to consider improvement measures to increase the collection rate in the future. Each university may have different attitudes toward interdisciplinary collaboration, depending on whether or not there are departments within the university that can collaborate. We will continue our research with additional surveys. It is also conceivable that there may be differences in the current state of the Kampo curriculum and desired future collaborations depending on the problems faced by each university. Although the present study was limited to comparisons between faculties, we plan to proceed with analysis within faculties in the future.

5. Conclusion

We examined Kampo education from different perspectives of medical, pharmacy, dentistry, and nursing departments, and identified the need for collaboration among them. We identified trends in what each individual department is looking for in specific areas, and this has given us a direction for the development of Kampo curriculum in the future. Based on these findings, a new curriculum that includes interdisciplinary collaboration is required.

Author contributions

MA, NU, and AA designed the study. NU, SK, YK, and MS conducted the investigation and data curation. HA created the figures and tables. AA, AI, TO, HS participated in the discussion. NU and MA wrote the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The Pharmacological Department of Herbal Medicine, Kagoshima University Graduate School of Medical and Dental Sciences is a joint research department with Kracie Pharma, Ltd.

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Table 1: Status of the Kampo curriculum in each department at Japanese universities

	Department				P-value for all group	
	Medicine	Pharmacy	Dentistry	Nursing		
Number of responding schools / Total number of schools	73 / 82	48 / 84	27 / 29	97 / 277	-	
Response rate (%)	89.02	57.14	93.1	35.02	<0.001	α
Kampo curriculum implementation rate (%)	98.63	100	70.37	21.65	<0.001	α
Has an interdisciplinary collaboration (%) ^{a)}	36.11	39.58	42.11	85.71	<0.001	α
Interdisciplinary collaboration system is necessary (%)	65.75	70.83	59.26	59.46	0.560	α
Total time of required classes (min) ^{a)}	634.24 ± 593.31	1618.13 ± 1603.09	291.84 ± 456.02	132.86 ± 185.53	<0.001	β
Total time of elective classes (min) ^{a)}	219.38 ± 724.91	784.38 ± 1308.97	0.00 ± 0.00	115.71 ± 282.68	<0.001	β
Total time of on-campus instructor classes (min) ^{a)}	429.79 ± 469.53	1872.50 ± 2154.89	217.50 ± 287.92	80.00 ± 203.33	<0.001	β
Total time for off-campus instructor classes (min) ^{a)}	220.35 ± 221.64	286.04 ± 521.65	57.37 ± 200.73	132.14 ± 234.93	<0.001	β

a) Calculated only for schools implementing Kampo curriculum.

P-value: α , chi-squared test; β , Kruskal Wallis test.

Table 2: Content of classes currently being offered in the Kampo curriculum

	Department				P-value for all group
	Medicine (%)	Pharmacy (%)	Dentistry (%)	Nursing (%)	
Efficacy of typically formulated medicine	83.33	95.83	89.47	61.90	0.003
Basic theories	80.56	95.83	73.68	66.67	0.013
Differences from Western medicine	75.00	89.58	73.68	33.33	<0.001
Side effects	75.00	97.92	78.95	38.10	<0.001
Examination methods in Kampo medicine	72.22	79.17	73.68	28.57	<0.001
History	68.06	93.75	89.47	28.57	<0.001
Clinical experience with medical specialists	65.28	39.58	21.05	14.29	<0.001
Therapy in accordance with the oriental medical syndromes	63.89	87.50	63.16	23.81	<0.001
EBM	62.50	77.08	36.84	14.29	<0.001
How to take Kampo medicine	59.72	81.25	52.63	28.57	<0.001
Crude drugs	58.33	95.83	47.37	23.81	<0.001
Kampo prescription by symptom	55.56	79.17	68.42	14.29	<0.001
How to decoct Kampo medicine	31.94	72.92	10.53	4.76	<0.001
Conceptual differences with Western medicine	1.39	0.00	0.00	0.00	0.746
Drug prices	8.33	14.58	5.26	4.76	0.470
Acupuncture and moxibustion	2.78	0.00	0.00	0.00	0.480
Other	0.00	0.00	10.53	0.00	0.002
Unknown as there is no one in charge	9.72	2.08	0.00	4.76	0.206

P-value: chi-squared test

Table 3: Departments that are currently collaborating in the Kampo curriculum, as well as the departments that wish to collaborate in the future

Department	Interdisciplinary collaborator				P-value for all group
	Medicine (%)	Pharmacy (%)	Dentistry (%)	Nursing (%)	
Medicine	10.96 (11.11)	49.32 (23.61)	6.85 (5.56)	30.14 (1.39)	<0.001
Pharmacy	72.92 (27.08)	14.58 0.00	0 0.00	10.42 (2.08)	<0.001
Dentistry	44.44 (26.32)	51.85 (21.05)	0 (5.26)	7.41 (5.26)	<0.001
Nursing	43.28 (42.86)	50.75 (52.38)	5.97 (4.76)	8.96 0.00	<0.001

() is percentage of interdisciplinary collaborations currently in place at universities implementing the Kampo curriculum.

P-value: Cochran's Q test.

Table 4: What each department wants from collaborators

	An instructor in class (%)	Consultation on curriculum development (%)	Instruction on clinical training (%)	Group discussion leader (%)	Guidance on crude drugs (%)	Medication guidance (%)
Medicine	36.99	28.77	19.18	6.85	34.25	28.77
Pharmacy	52.08	22.92	20.83	12.50	4.17	16.67
Dentistry	30.77	19.23	3.85	3.85	30.77	23.08
Nursing	64.00	20.00	16.00	16.00	16.00	28.00
P-value for all group	<0.001	0.508	0.242	0.132	<0.001	0.420

P-value: chi-squared test

Figure 1

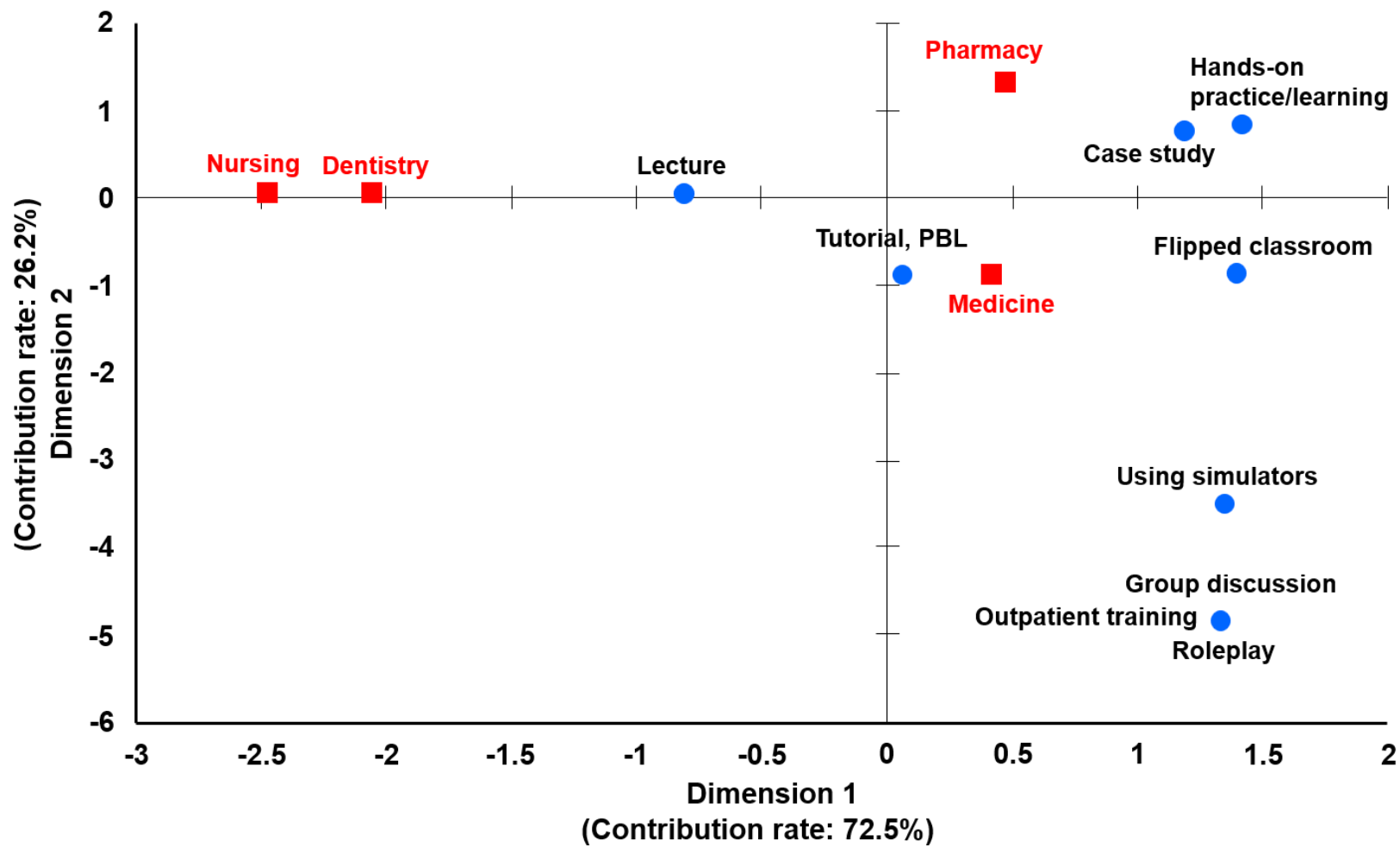


Figure 2

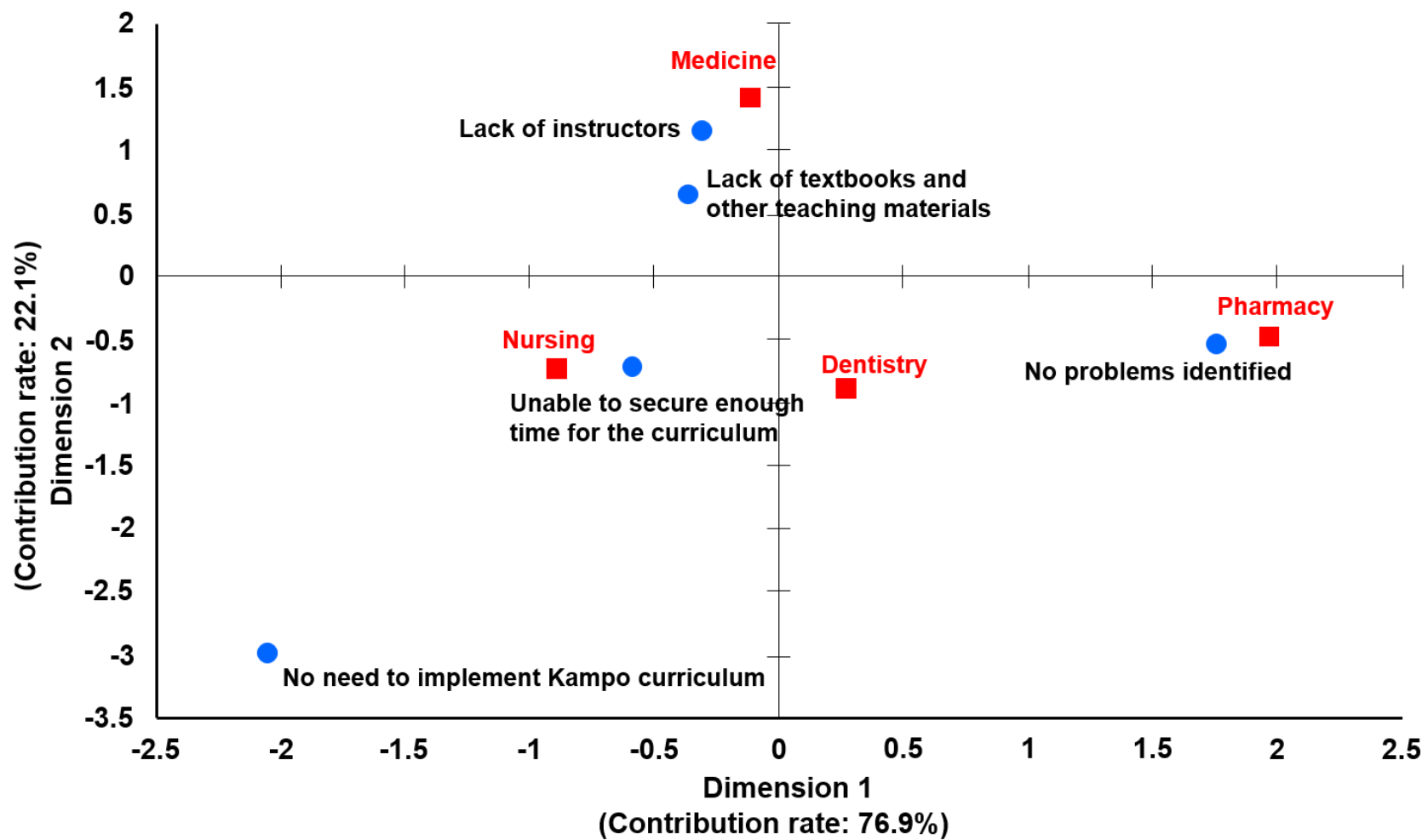


Figure 3

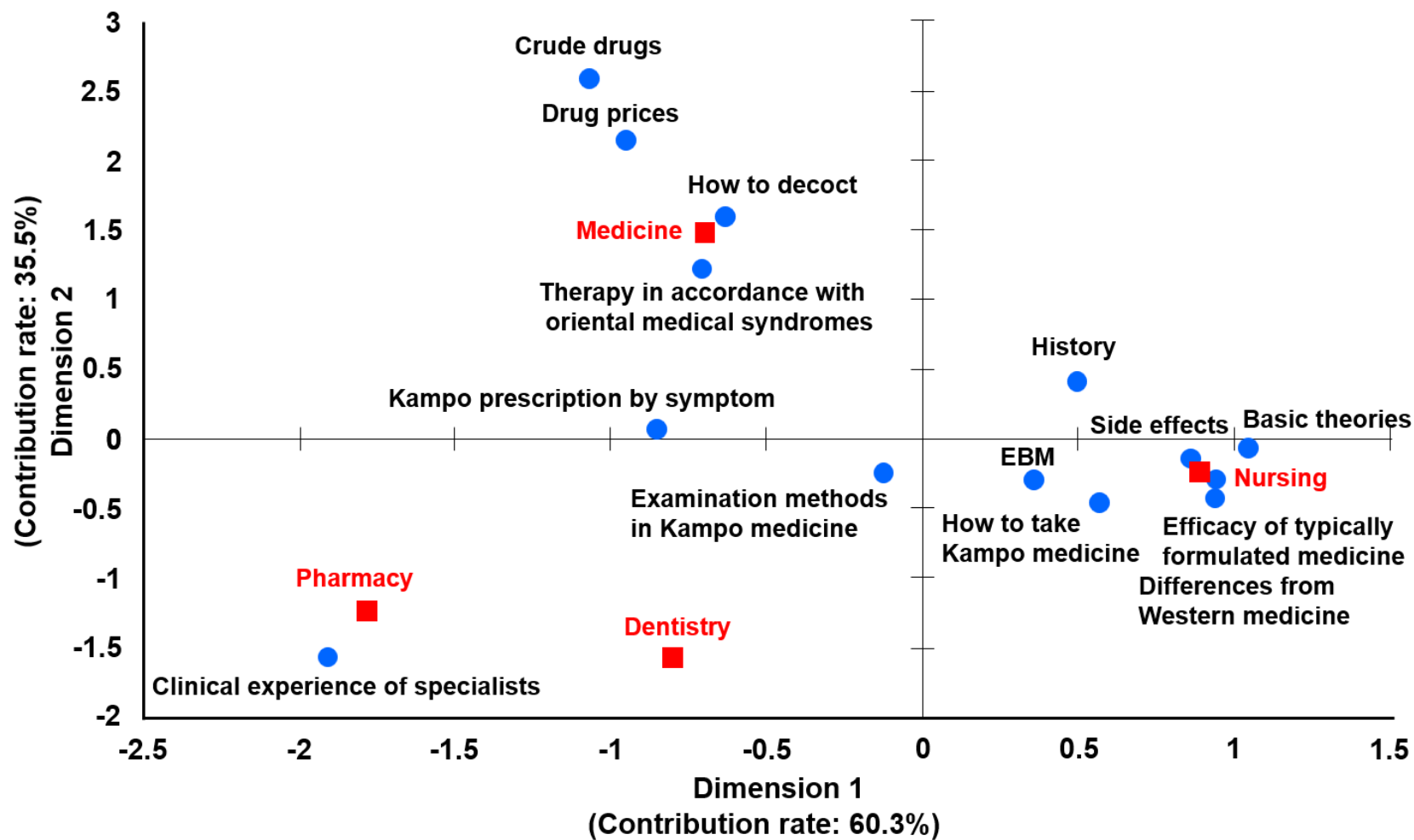


Figure 4

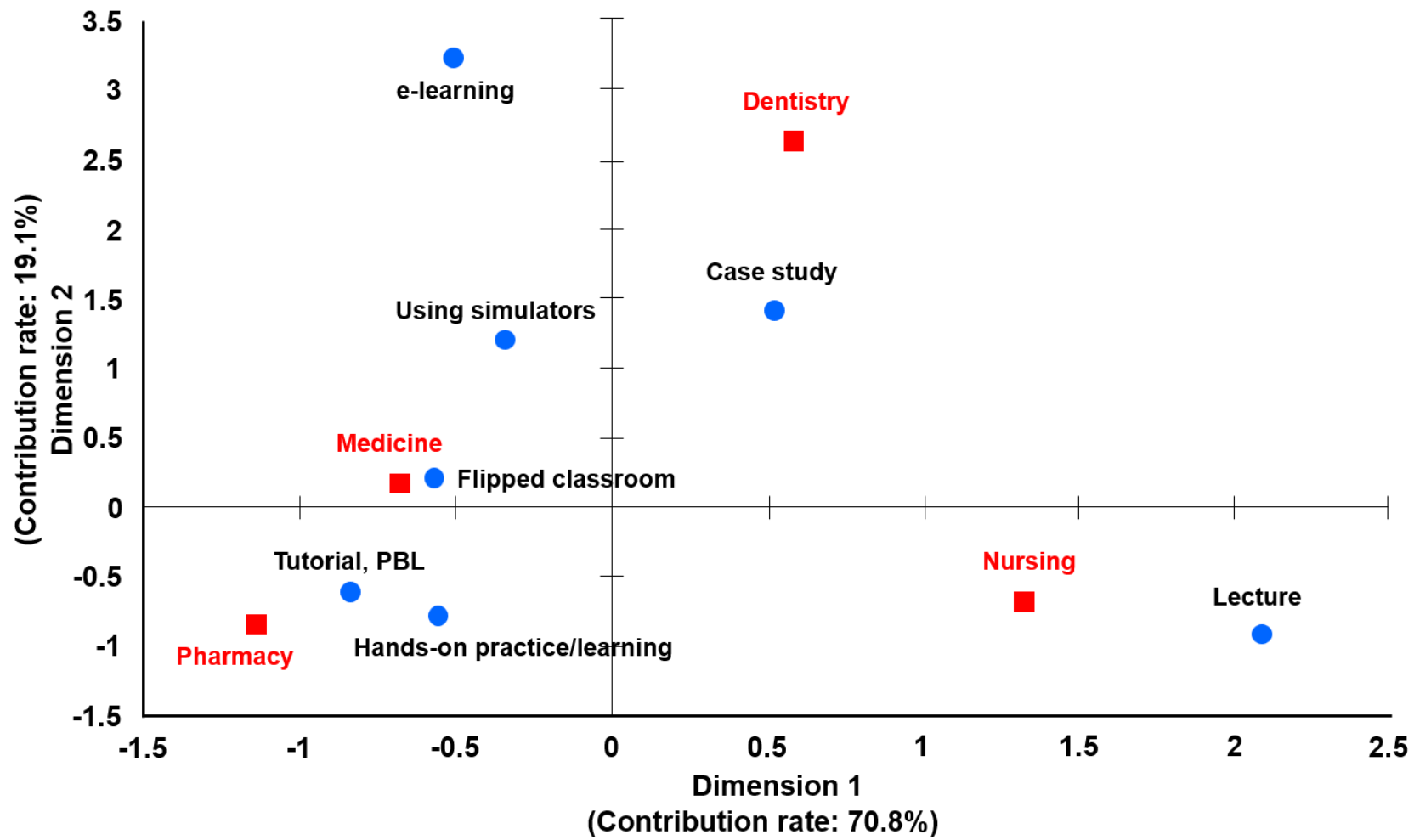


Figure 5

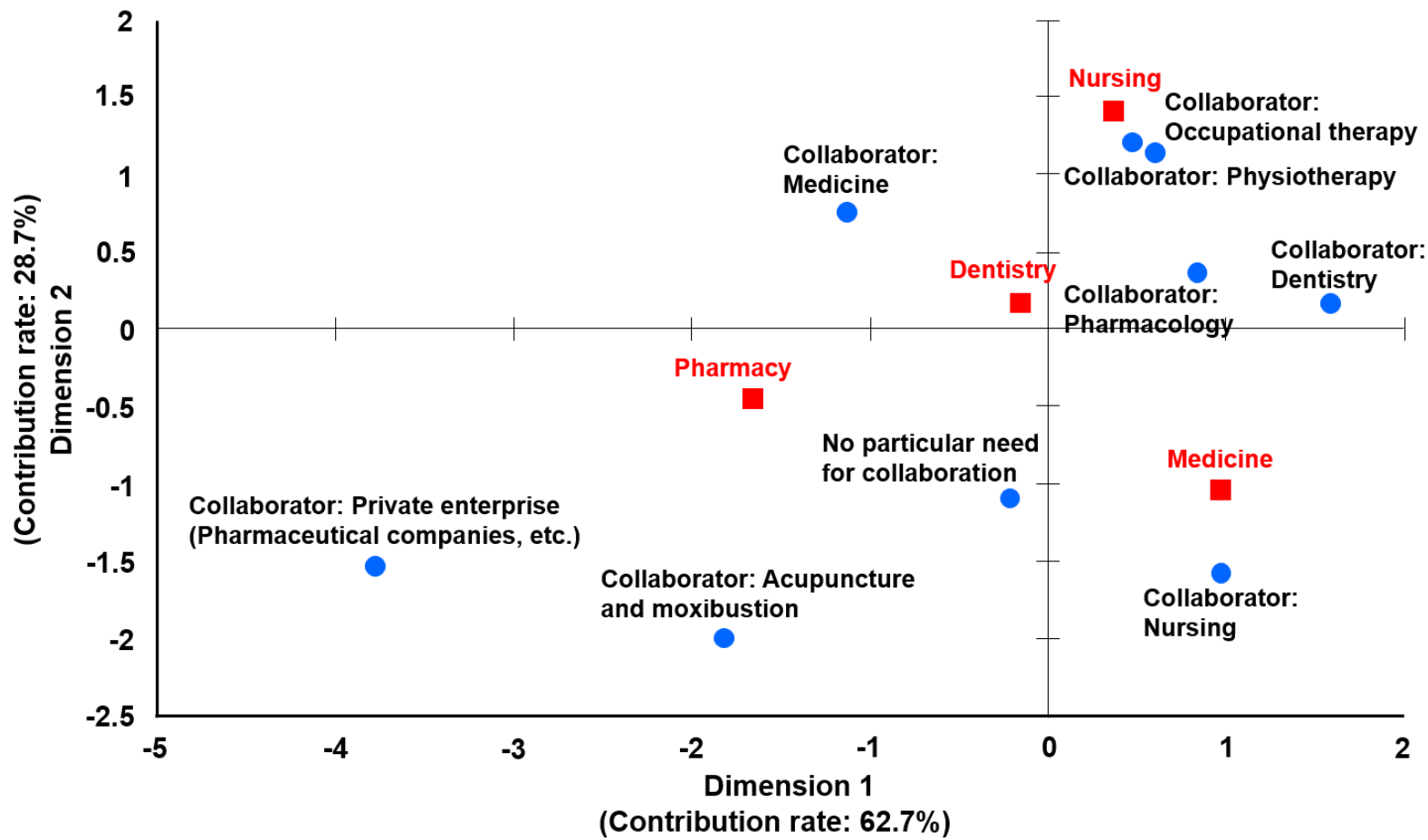
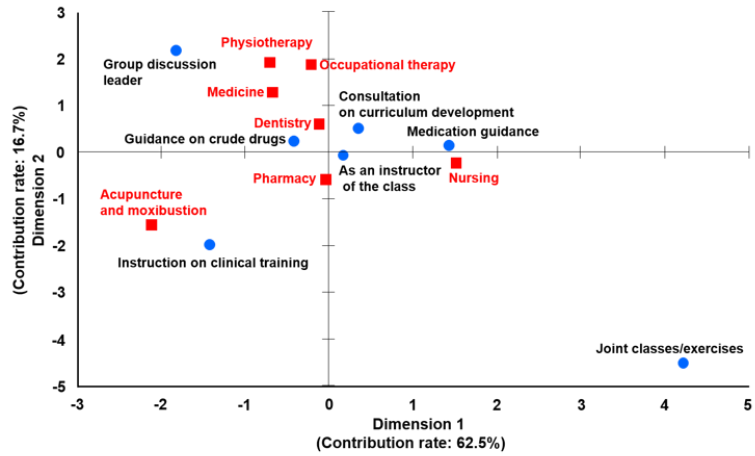
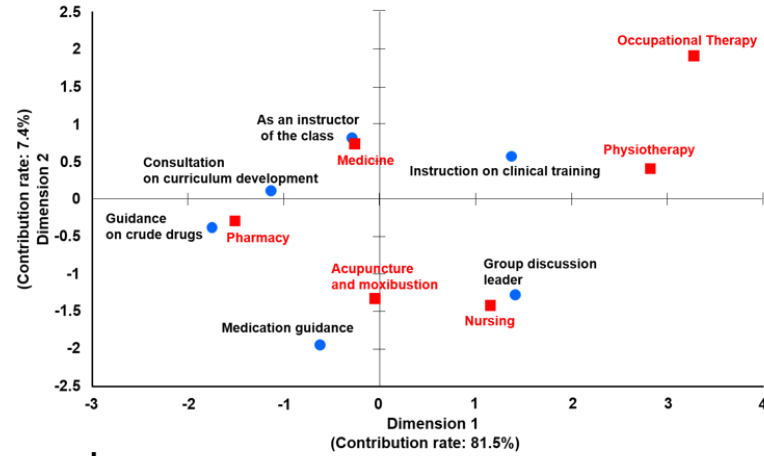


Figure 6

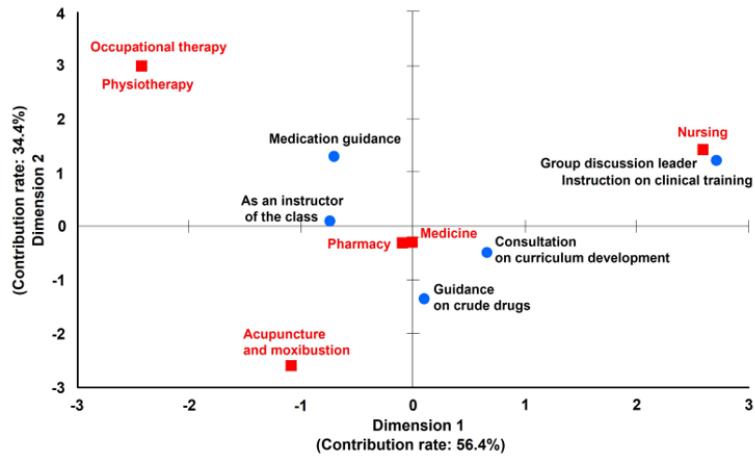
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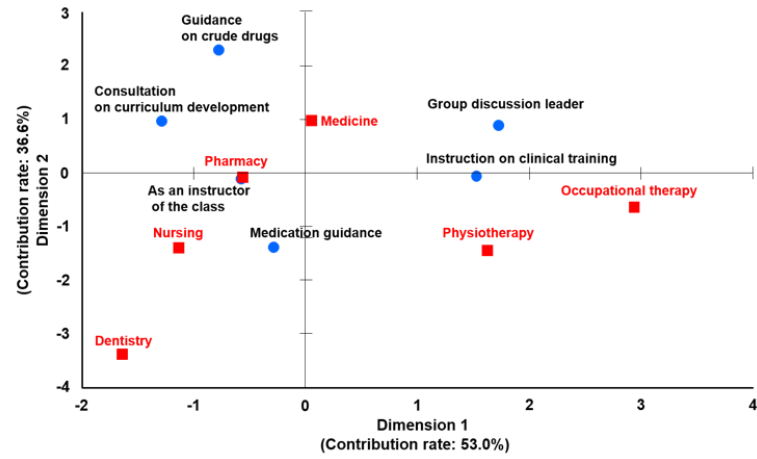
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Figure legends

Figure 1: The relationship among the teaching methods currently being implemented in the Kampo curriculum. Scatter plots using correspondence analysis to evaluate the correspondence between departments and educational policies. Red squares: departments, blue circles: teaching methods. PBL: problem-based learning.

Figure 2: The relationship among the problems that each university encountered in implementing the Kampo curriculum. Scatter plots using correspondence analysis to evaluate the correspondence between departments and the problems that each university encountered in implementing. Red squares: departments, blue circles: problems that each university encountered in implementing the Kampo curriculum. PBL: problem-based learning.

Figure 3: The relationship among the content of classes that are not currently offered, but that departments hope to introduce into the curriculum in the future. Scatter plots using correspondence analysis to evaluate the correspondence between departments and the content of classes that departments hope to introduce into the curriculum in the future. Red squares: departments, blue circles: the content of classes that departments hope to introduce into the curriculum in the future. EBM: evidence-based medicine.

Figure 4: The relationship among the class methods that are not currently being implemented, but that departments would like to incorporate in the future. Scatter plots using correspondence analysis to evaluate the correspondence between departments and the class methods that departments would like to incorporate in the future. Red squares: departments, blue circles: the class methods that departments would like to incorporate in the future. PBL: problem-based learning.

Figure 5: The relationship among the departments that wish to collaborate in the Kampo curriculum. Scatter plots using correspondence analysis to evaluate the correspondence between departments and the departments that wish to collaborate. Red squares: departments, blue circles: the departments that wish to collaborate.

Figure 6: Scatter plots using correspondence analysis. a-d) Tendency of desired collaborators and desired contents of collaboration from the perspective of each department. 6-a is for the department of medicine. 6-b is for the department of pharmacy. 6-c is for the department of dentistry. 6-d is for the department of nursing. Red squares: collaborators, blue circles: contents of collaboration.