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Complete List of Authors:	Seki, Masayasu; Jikei University School of Medicine, Department of Internal Medicine Fujinuma, Yasuki; Centre for Family Medicine Development, Japanese Health and Welfare Co-operative, family medicine Matsushima, Masato; Jikei University School of Medicine, Division of Clinical Epidemiology Joki, Tatsuhiro; The Jikei University School of Medicine, Department of Internal Medicine Okonogi, Hideo; The Jikei University School of Medicine, Department of Internal Medicine Miura, Yasuhiko; The Jikei University School of Medicine, Department of Internal Medicine Ohno, Iwao; The Jikei University School of Medicine, Department of Internal Medicine Hiramoto, Jun; The Jikei University School of Medicine, Department of Internal Medicine
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Use of a problem-based learning approach to change Japanese physicians' attitudes to learning primary care: a qualitative study

Masayasu Seki[1]*, Yasuki Fujinuma[2, 3], Masato Matsushima[4], Tatsuhiro Joki[1], Hideo Okonogi[5], Yasuhiko Miura[1], Iwao Ohno[1], Jun Hiramoto[1]

[1]Division of General Medicine, Department of Internal Medicine, The Jikei University School of Medicine, Tokyo, Japan

[2]Centre for Family Medicine Development, Japanese Health and Welfare Co-operative Federation, Tokyo, Japan

[3]Seikyo-ukima Clinic, Japanese Health and Welfare Co-operative Federation, Tokyo, Japan

[4]Division of Clinical Epidemiology, The Jikei University School of Medicine, Tokyo, Japan

[5]Division of Nephrology and Hypertension, Department of Internal Medicine, The Jikei University School of Medicine, Tokyo, Japan

*Corresponding author:

Masayasu Seki, MD, PhD

Lecturer

Division of General Medicine, Department of Internal Medicine, The Jikei University School of Medicine, 3-25-8 Nishi-shimbashi, Minato-ku, Tokyo 105-8461, Japan

Email: masayasu-seki@jikei.ac.jp

Tel.: +81-3-3433-1111

Fax.: +81-3-5400-1267

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ABSTRACT

Objective

To evaluate changes in learning attitudes of primary care physicians.

Design

Qualitative study of a focus group interview using the Steps for Coding and Theorization (SCAT) method.

Setting

Japan.

Participants

Eight primary care physicians who completed a 2-year continuing professional development (CPD) program using a problem-based learning (PBL) approach, focused on acquiring the skills needed to practice as primary care physicians in the community.

Results

Participants described positive changes in their attitudes and behaviors as a result of the training program. These changes were grouped into three main themes: "changes in learning methods regarding medical practice," "encounters with diverse perspectives and values, and confidence gained from those encounters," and "showing one's attitude towards learning and its influence on others." The experienced practitioners participating in this study reported that the program helped them apply their skills more broadly; for example, searching the literature for psychosocial aspects of practice and engaging more comfortably with diverse perspectives. They reported the positive impact of their learning on others with whom they were working.

Conclusion

A 2-year CPD program using PBL can influence primary care physicians' attitudes and learning-related behaviors. Further research is needed to determine which specific aspects of the program are the most effective and whether the changes in attitudes and behaviors described affect patient care.

KEYWORDS: primary care, learning attitudes, qualitative, continuing professional development (CPD), problem-based learning.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This study examined changes in learning attitudes among primary care physicians following a CPD program.
- This study had a small sample size.
- The study was a single focus group interview involving all participants, which was conducted four years ago.
- It is unclear whether changes in learning attitudes among participants have led to improved quality of patient care.

INTRODUCTION

Medical education continues from undergraduate education to continuing professional development (CPD), with doctors working in various roles as practitioners, researchers, and teachers.[1] CPD responds not only to the development of the doctors' personal professional development, but also the needs of patients, their families, and their community.[2] Family medicine and primary care are disciplines that provide long-term care centered on people of all ages and situations.[3] It is comprehensive, continuing from pre-natal care to palliative care.[3] No training program – regardless of its duration or content – can provide the postgraduate medical trainee with all competencies needed for primary care.3 Primary care physicians need to commit to life-long learning with a deliberate CPD plan to practice with an expert level of clinical skills.[4]

General practitioners (GPs) in Japan may become family practitioners or hospitalists.[5] Approximately one-third of physicians in Japan are in charge of primary care at their own private clinic after 5–10 years of specialist practice training at university hospitals or city general hospitals.[6] Many physicians do not have public primary care training but independently undertake learning and training in this area. Unlike physicians in many other countries, they do not need to participate in a specific CPD program on primary care to maintain licensure.[7] The Japan Primary Care Association, established in 2010, is responsible for board certification of senior residents who complete their training program.[5, 8] The Japanese Medical Specialty Board (distinct from the Japan Primary Care Association) was newly established in 2017 to manage the certification of GPs in Japan.[5] Board-certified GPs were recognized as a new specialist category under a board certification senior resident training program that began in 2018.[8, 9] Although an education program for senior residents is now in place, educational support for veteran primary care physicians whose training was focused on specific organ systems is inadequate. Therefore, we considered that the CPD of primary care physicians in Japan should be supported.

We started a 2-year Family Medicine Brush-up Program in April 2016, which is an interactive CPD program for primary care physicians with a problem-based learning (PBL) approach. The program aimed to enable participants to discuss and learn about issues encountered in primary care by studying scenarios based on themes such as those found in Appendix 1.[10] We conducted a qualitative study to clarify participants' training needs and inform the program content.[10] Three categories of participant statements were established: "no standard re-education program for primary care physicians to respond to changes in the clinical and practice setting," "problems with undergraduate and postgraduate medical education in primary care," and "content of primary care CPD."[10] This study led to the need to examine the changes that participants experienced as a result of the program.[10] CPD programs such as our Family Medicine Brush-up Program are often assessed with the Kirkpatrick model.[1, 11] Ideally, a CPD program for physicians should be assessed for its

effects on Kirkpatrick level 4 patients. Assessment of the effects on level 4 patients is hindered by factors such as the education effects requiring time to become apparent and the large number of confounders.[1] A study regarding CPD programs has suggested that a PBL approach can improve physicians' performance and patient care.[12, 13] In addition, team-based CPD activities, consistent with the nature of our program, are considered to elicit positive responses from participants, and positive changes in their awareness and attitudes, views of teamwork, and knowledge and collaboration skills.[14] Thus, the study demonstrated the effects of team-based CPD activities corresponding to levels 1, 2a, and 2b in the Kirkpatrick model. However, few studies have reported results related to individual behavior, organizational practice, or benefits to patients. Changes reported in previous studies include positive changes in interactions among individual practitioners (level 3), positive changes in team-based referral practice and work style, and increased motivation regarding organizational improvement (level 4a).[14] However, it is unclear whether participation in our program yields the same changes in learners as in previous studies.

Therefore, we surveyed participants in our program to examine the changes they experienced in their attitudes to learning, corresponding to levels 2 and 3 of the Kirkpatrick model. We chose not to directly assess organizational changes and patient outcomes, which correspond to level 4, given the difficulty in surveying the medical staff and patients at the participants' workplaces. Interview surveys, considered appropriate for assessing Kirkpatrick model level 3, can also be used to assess items relevant to level 2-equivalent learning.[1] We chose to conduct a qualitative study based on interviews with participants, aiming to clarify how our program changed the attitudes to learning.

METHODS

Study design and participants

On completion of the program (January 2018), we conducted a single focus group interview with program participants to investigate the changes that had occurred during the program. Interviews are considered effective for assessing changes in behavior and correspond to Kirkpatrick level 3.[1, 14, 15]

Eight participants completed the Family Medicine Brush-up Program targeting physicians who had not undertaken specialist training in family medicine and had qualified at least 10 years previously. The interview was conducted at the end of the program with the eight physicians (A–H, Table 1). This study was approved by the Institutional Review Board of the Jikei University School of Medicine (Study number: 27-277[8162]). All participants provided written informed consent to participate in this study. The results were presented following the COREQ guidelines for reporting qualitative studies[16] (Appendix 2).

Table 1. Attributes of participants

	Age	Sex	Setting	Medical specialty
A	50s	M	Private clinic	Cardiology
B	40s	M	Private clinic	Emergency medicine
C	30s	M	City general hospital	Rheumatology and connective tissue disease
D	30s	F	City general hospital	Internal medicine
E	30s	F	Private clinic	General medicine and primary care
F	40s	F	University hospital	General medicine and primary care
G	40s	M	City general hospital	Internal medicine
H	40s	F	Private clinic	Anesthesiology

Data collection

The participants received an explanation of how to record and conduct the interview, and consented to be interviewed. The focus group interview was conducted with the guiding questions: 1) "What kind of changes do you have in your awareness and behavior after taking this program?"; and 2) "Do you notice any change in the behavior or attitude of staff at your workplace?"

The participants were interviewed in a quiet room undisturbed by daily activities, using a digital recorder. Three authors (MS, YF, and TJ), all primary care physicians, managed the interviews. YF had the most experience with interviewing and was therefore the main interviewer, with MS and TJ assisting and make field notes. These three authors had also managed the program and facilitated the participants' learning over the past 2 years.

The interview time was set to 60 minutes. When one participant responded to a question, several others typically added their opinions. YF asked all the participants questions using the guide questions in chronological order and encouraged participants with relatively few responses to provide additional opinions. In actuality, the interview took 72 minutes. At that point, the interviewer agreed that theoretical saturation had been achieved without any further opinions from the participants.

Data analysis

We analyzed the interview records with the Steps for Coding and Theorization (SCAT) method.[17] SCAT is an analytical method that adds codes in a four-step process, from raw interview data to themes (Table 2).[17, 18] We used this method when conducting a previous study on the needs of participants for the program.[10] SCAT is suitable for the analysis of relatively small samples, such as those used in the previous study, and it was considered appropriate to use SCAT for this study of similarly small samples.[17] Using the tape transcription, two authors (MS and TJ) independently coded the text for SCAT Steps 1 to 3.[17] The two authors conferred about conflicting opinions about the content of the code until they reached a joint consensus. Three authors (MS, TJ, and HO) independently conducted the coding for SCAT Step 4.[17] The three authors again conferred and agreed on common themes and constructs about the content of the code. Transcripts were not returned to participants, and we did not provide feedback on the findings.

Table 2. Four steps following the SCAT (Steps for Coding and Theorization) method

	Analysis procedure	Examples
Step 0	Raw interview data	"I was able to learn systematically, not only biomedical issues but also psychosocial ones, by finding learning topics in scenarios, searching for literature, and considering it logically."
Step 1	Notable words in Step 0	"learn systematically," "biomedical issues," "psychosocial ones," "searching for literature," "consider logically"
Step 2	Words that are not in the data to paraphrase Step 1	Principles of family medicine, critical thinking
Step 3	Words to explain Step 2	Experience of being able to apply evidence-based learning methods that were applicable to biological problems to psychosocial problems

Step 4	Themes and constructs that emerge from Step 3	Changes in learning methods regarding medical practice

Patient and public involvement

There was no patient or public involvement in the design or carrying out of this study.

RESULTS

The participants' interview records were organized into three categories: "changes in learning methods regarding medical practice," "encounters with diverse perspectives and values, and confidence gained from those encounters," and "showing one's attitude towards learning and its influence on others" (Table 3). This section presents excerpts from focus group interviews on these categories.

Table 3. Themes and constructs about changes in behaviors

Themes and constructs	Phrases
Changes in learning methods regarding medical practice	Psychosocial problem, search for material and literature.
Encounters with diverse perspectives and values, and confidence gained from those encounters	Confidence, tolerance of diversity, no judgment attitude for another's opinion, loneliness about own practice, no standard re-education program.
Showing one's attitude towards learning and its influence on others	Active transformation of colleagues' learning motivation.

Changes in learning methods regarding medical practice

"I had never given much thought to my routine practice before, but the program made me dig deeper again into questions such as what guidelines said and what kind of literature there was." (B)

"Now I search not only for secondary materials but also primary materials." (C, D)

"All of us in the program gave presentations and had discussions based on statistics we looked up for ourselves." (G)

"I was able to learn systematically, not only biomedical issues but also psychosocial ones, by finding learning topics in scenarios, searching for literature, and considering it logically." (A)

Encounters with diverse perspectives and values, and confidence gained from those encounters

"I felt like I would be judged for my presentation, but there was no critical atmosphere around presentations at all. It was an environment where I could research my learning topic freely and get feedback from everyone." (D)

"I recognized that it's not really about whether someone is right or wrong, but that maybe there can be all kinds of physicians." (E)

"I dove right into practicing family medicine without training in it. I had no confidence in myself, and I worried about what I should do and how I should study. The first thing that changed in me through participating in this program was meeting all kinds of physicians and encountering many ways of living. The program reminded me of the truth of how enjoyable it is to learn, even though my daily work as a physician is overwhelming, to think hard about my next own learning topic and compare it with what I actually see in my own patients." (H)

"In the clinic, in my position as the manager, even when I get lonely or worry about my relationships with my staff, I have no one to turn to for advice where my clinic is located. The only choice I ever had was to sort things out in my own head. However, by going to a place far away from my clinic and opening up to the people I met there, I learned that I'm not the only one who feels lonely." (H)

"I have the impression that the level of learning varies quite a bit depending on how much someone opens themself up." (C)

Showing one's attitude towards learning and its influence on others

"My staff told me that seeing me hard at work researching issues between examinations showed them that it's possible to learn even when you're busy. They said that when they saw how I studied, it made them want to work harder too." (H)

"I now make it a point to tell all of my staff everything I learned about in this program. I make sure to jot down what I learned and put it up in the meeting room." (A)

"For instance, I have the staff at my clinic actually write out genograms based on what I learn from my patients. I think it's given my staff the ability to look at things from the perspective of the families and lifestyles of our patients." (A)

DISCUSSION

The first behavioral change that emerged in the participants' statements was a change in learning method. Our PBL approach yielded results for the participants' learning similar to those in previous studies. One participant stated that their literature searches and logical reasoning had changed not only regarding biological issues, but also psychosocial issues. Psychosocial problem-solving is a core competence in family medicine and primary care.[19] The participants in our program have a great deal of practical experience as specialists of different organs and are well-versed in literature searches and logical reasoning for biological issues. In addition to this capacity, our results suggested that completing our program may help participants acquire literature search and logical reasoning capacities for psychosocial issues.

The second behavioral change that emerged was related to encounters with diverse perspectives and values and the confidence gained from those encounters. As previous studies have found, the absence of re-education programs often leads to learning in a solitary environment.[6, 20] In Japan, many private physicians engaged in primary care have solo practices.[21] By providing participants with an arena for learning, our program may have encouraged positive changes in the participants' attitudes. However, it is unclear whether adopting a PBL approach is what led to the positive changes. Providing an arena for learning and forming a learning community may be important, regardless of learning style. Further study is necessary to determine whether confidence, a specific change in the participants' attitudes, results from the learning format.

Participants spoke favorably about our program being held away from the locations where they practice. However, for physicians in rural areas, traveling to such programs is often considered an obstacle to participation.[13] Holding programs online facilitates participation from remote areas. In comparisons of online and on-site education, results are mixed.[22] One participant in the present study stated that it is difficult to consult with other medical professionals in her own community about issues encountered with patients. For learning about content highly relevant to the participants' practices, providing a learning community away from the areas where they practice may foster better learning. However, given the current COVID-19 pandemic, hosting the program online would reduce the risk of infection. Further study is necessary to determine whether an online program would yield

the same results.

Another participant in our study noted that discussions regarding the results of learning topics and participants' practices and values did not lead to a judgmental atmosphere. A positive atmosphere in classes and groups is considered to bring about cooperative learning, while positive discussions and a learner culture are thought to diversify learning, encourage flexible thinking, and increase creativity.[23] In East Asia, the learning style in medical education is based on Confucian culture.[24] The communication style is expressed as "cultural reticence"[25] – a tendency to not actively express what you know or feel.[25] Relevant to the comment that the level of learning may change depending on the degree to which someone opens themself up, the program facilitator was called upon to provide a safe discussion atmosphere in which the participants' presentations would not be judged as right or wrong and which promoted self-disclosure. Currently, no formal training exists for such facilitators. Going forward, training to help facilitators promote discussion should be conducted while the program is administered.

The last behavioral change was the influence on others. Few studies have demonstrated that participation in a program such as ours leads to behaviors that improve organizational care.[15] The present study suggested that program participants can promote a positive attitude towards learning in their workplace staff and others around them by demonstrating their own attitude towards learning and sharing what they have learned. In East Asia, where Confucian influences are strong, students respect teachers, learn from them, and imitate their attitudes.[24] Such a cultural background may also improve the learning attitude of the workplace staff. However, it is unclear whether staff actually put their learning into practice in patient care. Further examination of the effects of learning programs will require surveys of the participants' staff and confirmation of changes in patient care.

Limitations

Although our program took place over 2 years, one participant dropped out after only 1 year. Participation in the program was no longer possible because of changes in the medical practice hours. The interview in the present study may not necessarily reflect all changes in the attitudes to learning among the program participants, and it would also have been helpful to include the views of the non-completing participant.

This study is an analysis of a single focus group interview with all participants who completed the program. It is unclear whether multiple focus group interviews with the participants would have yielded similar results. Future research will require multiple focus groups with larger numbers of participants.

The interview was conducted by facilitators who had been involved with the program for its 2-year duration. Close involvement in the learning process may have enabled the facilitators to encourage deeper discussion than an interviewer without such involvement. Conversely, the

involvement of the interviewers in the learning process may have influenced the discussion about the effective outcomes of the program, as participants might not have wanted to offend the facilitators.

CONCLUSIONS

This study confirmed that participation in our 2-year CPD program changed participants' learning attitudes and education-related behavior. Our results suggest that support of CPD for primary care physicians requires the preparation of a learning community based on diverse values and perspectives, and the capacity for facilitation to foster the learning community.

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STATEMENTS

Contributorship statement

MS conceived the study, contributed to the development of its design, received the JSPS KAKENHI grant, collected the data, and analyzed the qualitative data. YF conceived the study, contributed to the development of the design and interviewed the participants. MM conceived the study, contributed to the design, and facilitated the focus group interview. TJ facilitated the focus group interview and analyzed the qualitative data. HO analyzed the qualitative data and contributed to the design. YM, IO and JH conceived the study and contributed to the design. All authors contributed to the drafting of the manuscript, and read and approved the final manuscript.

Competing interests

MM received lecture fees and lecture travel fees from the Centre for Family Medicine Development of the Japanese Health and Welfare Co-operative Federation. MM is an adviser for the Centre for Family Medicine Development Practice-Based Research Network. The other authors report no conflict of interest.

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Data sharing statement

Because of the nature of this study, participants did not agree that their data could be shared publicly, so supporting data are not available.

Patient consent for publication

Not required

Ethics approval

This study was approved by the Institutional Review Board of the Jikei University School of Medicine (Study number: 27-277[8162]).

Provenance and peer review

Not commissioned; externally peer reviewed.

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APPENDIX 1

Primary care themes covered in the Family Medicine Brush-up Program

I. Typical health problems in primary care

Child – old age care	Palliative care	Women's health
Rehabilitation	Mental health problems	Vaccination
Chinese medicine	Common emergencies	Musculoskeletal problem
Surgery	Ophthalmology	Otorhinolaryngology

II. The principles of family medicine

Patient-centered clinical method	Family-oriented care	
Biopsychosocial model	Interprofessional work	
Prevention and health promotion	Ethics and law	Patient-clinician relationship
Healthcare context and continuity	Behavior modification	
Complexity and uncertainty	Reflective learning	

III. Interpersonal and communication skills

Medical interview	Laboratory tests in the clinic
Clinical problem solving	Evidence-based medicine
Professionalism	Minorities and socially vulnerable
Facility management	Practice guidelines

APPENDIX 2

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

No	Item	Guide questions/description	
Domain 1: Research team and reflexivity			
Personal Characteristics			
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group?	Yasuki Fujinuma conducted the focus group interview. Masayasu Seki and Tatsuhiro Joki assisted. Page 6.
2.	Credentials	What were the researchers' credentials? *E.g., PhD, MD*	Masayasu Seki, MD, PhD Yasuki Fujinuma, MD Masato Matsushima, MD, PhD, MPH Tatsuhiro Joki, MD, PhD Hideo Okonogi, MD, PhD Yasuhiko Miura, MD, PhD Jun Hiramoto, MD, PhD Iwao Ohno, MD, PhD. Page 1.

No	Item	Guide questions/description	
3.	Occupation	What was their occupation at the time of the study?	All researchers were primary care physician. Page 1.
4.	Gender	Was the researcher male or female?	All researchers were male. Page 1.
5.	Experience and training	What experience or training did the researcher have?	We conducted this research using the same analysis as for a previous study. Page 4.
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Participants were interviewed after taking the Family Medicine Brush-up Program for two years. Interviewers facilitated the program. Page 5, 6.
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e.*g.*,	The participants received an explanation of the taped focus group interview process and gave their consent to participate. Page 5, 6.

No	Item	Guide questions/description	
		personal goals, reasons for doing the research	
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g., *Bias, assumptions, reasons and interests in the research topic*	The main interviewer (Yasuki Fukumuma) was practicing primary care and was engaged in research and education activities in family medicine. Page 6.
Domain 2: study design			
Theoretical framework			
9.	Methodological orientation and theory	What methodological orientation was stated to underpin the study? *e.g., grounded theory, discourse analysis, ethnography,*	The content of the interview was analyzed with the Steps for Coding and Theorization (SCAT) method. Page 7.

No	Item	Guide questions/description	
		phenomenology, content analysis	
Participant selection			
10.	Sampling	How were participants selected? *e.g., purposive, convenience, consecutive, snowball*	Participants were all those who had completed the two-year program. Page 5, 6.
11.	Method of approach	How were participants approached? e.*g., face-to-face, telephone, mail, email*	Face-to-face. Page 6.
12.	Sample size	How many participants were in the study?	8 participants. Page 5, 6.
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	None. Page 5, 6.

No	Item	Guide questions/description	
Setting			
14.	Setting of data collection	Where was the data collected? e.g., *home, clinic, workplace*	The participants were interviewed in a quiet room undisturbed by daily activities. Page 6.
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	No. Page 6.
16.	Description of sample	What are the important characteristics of the sample? *e.g., demographic data, date*	Eight participants completed the Family Medicine Brush-up Program targeting physicians who had not undertaken specialist training in family medicine and had qualified at least 10 years previously. Page 5.
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	The interview was conducted using the guiding questions and was not pilot tested. Page 6.

No	Item	Guide questions/description	
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	A single focus group interview was conducted. Page 6.
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data?	The interview was audio-recorded using a digital recorder. Page 5.
20.	Field notes	Were field notes made during and/or after the interview or focus group?	Yes. Page 6.
21.	Duration	What was the duration of the interviews or focus group?	72 minutes. Page 6.
22.	Data saturation	Was data saturation discussed?	Saturation was defined as the point with no new comments from the participants. Page 6.
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No. Page 7.

No	Item	Guide questions/description	
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	Two. Page 7.
25.	Description of the coding tree	Did authors provide a description of the coding tree?	Yes (see results). Page 7, 8.
26.	Derivation of themes	Were themes identified in advance or derived from the data?	Themes were derived from the data. Page 7, 8.
27.	Software	What software, if applicable, was used to manage the data?	Not applicable. Page 7.
28.	Participant checking	Did participants provide feedback on the findings?	No. Page 7.

No	Item	Guide questions/description	
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes/ findings? Was each quotation identified? e.*g.*, *participant number*	Yes, quotations are presented and identified. Page 8, 9.
30.	Data and findings consistent	Was there consistency between the data presented and the findings?	Yes. Page 8, 9.
31.	Clarity of major themes	Were major themes clearly presented in the findings?	Yes. Page 8.
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Yes. Page 8, 9.

APPENDIX 2

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

No	Item	Guide questions/description	
Domain 1: Research team and reflexivity			
Personal Characteristics			
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group?	Yasuki Fujinuma conducted the focus group interview. Masayasu Seki and Tatsuhiro Joki assisted. Page 6.
2.	Credentials	What were the researchers' credentials? *E.g., PhD, MD*	Masayasu Seki, MD, PhD Yasuki Fujinuma, MD Masato Matsushima, MD, PhD, MPH Tatsuhiro Joki, MD, PhD Hideo Okonogi, MD, PhD Yasuhiko Miura, MD, PhD Jun Hiramoto, MD, PhD Iwao Ohno, MD, PhD. Page 1.

No	Item	Guide questions/description	
3.	Occupation	What was their occupation at the time of the study?	All researchers were primary care physician. Page 1.
4.	Gender	Was the researcher male or female?	All researchers were male. Page 1.
5.	Experience and training	What experience or training did the researcher have?	We conducted this research using the same analysis as for a previous study. Page 4.
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Participants were interviewed after taking the Family Medicine Brush-up Program for two years. Interviewers facilitated the program. Page 5, 6.
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e.*g.*,	The participants received an explanation of the taped focus group interview process and gave their consent to participate. Page 5, 6.

No	Item	Guide questions/description	
		personal goals, reasons for doing the research	
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g., *Bias, assumptions, reasons and interests in the research topic*	The main interviewer (Yasuki Fujinuma) was practicing primary care and was engaged in research and education activities in family medicine. Page 6.
Domain 2: study design			
Theoretical framework			
9.	Methodological orientation and theory	What methodological orientation was stated to underpin the study? *e.g., grounded theory, discourse analysis, ethnography,*	The content of the interview was analyzed with the Steps for Coding and Theorization (SCAT) method. Page 7.

No	Item	Guide questions/description	
		phenomenology, content analysis	
Participant selection			
10.	Sampling	How were participants selected? *e.g., purposive, convenience, consecutive, snowball*	Participants were all those who had completed the two-year program. Page 5, 6.
11.	Method of approach	How were participants approached? e.*g., face-to-face, telephone, mail, email*	Face-to-face. Page 6.
12.	Sample size	How many participants were in the study?	8 participants. Page 5, 6.
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	None. Page 5, 6.

No	Item	Guide questions/description	
Setting			
14.	Setting of data collection	Where was the data collected? e.*g., home, clinic, workplace*	The participants were interviewed in a quiet room undisturbed by daily activities. Page 6.
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	No. Page 6.
16.	Description of sample	What are the important characteristics of the sample? *e.g., demographic data, date*	Eight participants completed the Family Medicine Brush-up Program targeting physicians who had not undertaken specialist training in family medicine and had qualified at least 10 years previously. Page 5.
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	The interview was conducted using the guiding questions and was not pilot tested. Page 6.

No	Item	Guide questions/description	
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	A single focus group interview was conducted. Page 6.
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data?	The interview was audio-recorded using a digital recorder. Page 5.
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21.	Duration	What was the duration of the interviews or focus group?	72 minutes. Page 6.
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Domain 3: analysis and findings			
Data analysis			
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27.	Software	What software, if applicable, was used to manage the data?	Not applicable. Page 7.
28.	Participant checking	Did participants provide feedback on the findings?	No. Page 7.

No	Item	Guide questions/description	
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes/ findings? Was each quotation identified? e.*g.*, *participant number*	Yes, quotations are presented and identified. Page 8, 9.
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Use of *a 2-year continuing professional development program* to change Japanese physicians' attitudes to learning primary care: a qualitative study

Masayasu Seki[1]*, Yasuki Fujinuma[2, 3], Masato Matsushima[4], Tatsuhiro Joki[1], Hideo Okonogi[5], Yasuhiko Miura[1], Iwao Ohno[1], Jun Hiramoto[1]

[1]Division of General Medicine, Department of Internal Medicine, The Jikei University School of Medicine, Tokyo, Japan

[2]Centre for Family Medicine Development, Japanese Health and Welfare Co-operative Federation, Tokyo, Japan

[3]Seikyo-ukima Clinic, Japanese Health and Welfare Co-operative Federation, Tokyo, Japan

[4]Division of Clinical Epidemiology, The Jikei University School of Medicine, Tokyo, Japan

[5]Division of Nephrology and Hypertension, Department of Internal Medicine, The Jikei University School of Medicine, Tokyo, Japan

*Corresponding author:

Masayasu Seki, MD, PhD

Lecturer

Division of General Medicine, Department of Internal Medicine, The Jikei University School of Medicine, 3-25-8 Nishi-shimbashi, Minato-ku, Tokyo 105-8461, Japan

Email: masayasu-seki@jikei.ac.jp

Tel.: +81-3-3433-1111

Fax.: +81-3-5400-1267

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ABSTRACT

Objective

To evaluate changes in the learning attitudes of primary care physicians.

Design

Qualitative study of a focus group interview using the Steps for Coding and Theorization (SCAT) method.

Setting

Japan.

Participants

Eight primary care physicians who completed a 2-year continuing professional development (CPD) program using a problem-based learning (PBL) approach, focused on acquiring the skills needed to practice as primary care physicians in the community.

Results

Participants described positive changes in their attitudes and behaviors as a result of the training program. These changes were grouped into three main themes: "changes in learning methods regarding medical practice," "encounters with diverse perspectives and values, and confidence gained from those encounters," and "showing one's attitude towards learning and its influence on others." The experienced practitioners participating in this study reported that the program helped them apply their skills more broadly; for example, searching the literature for psychosocial aspects of practice and engaging more comfortably with diverse perspectives. They reported the positive impact of their learning on their co-workers.

Conclusion

A 2-year CPD program using PBL can influence primary care physicians' attitudes and learning-related behaviors. Further research is needed to determine which specific aspects of the program are the most effective and whether the changes in attitudes and behaviors described affect patient care.

KEYWORDS: primary care, learning attitudes, qualitative, continuing professional development (CPD), problem-based learning.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This study evaluated a Family Medicine Brush-up Program that was implemented as a CPD program for experienced primary care physicians.
- This study examined changes in learning attitudes of the Kirkpatrick model level 3 among primary care physicians following a 2-year CPD program.
- This study had a small sample size and was a single focus group interview conducted in 2018.
- It is unclear whether changes in learning attitudes among participants have led to improved quality of patient care.
- Bias may have occurred due to the fact that the program facilitator was the main interviewer.

INTRODUCTION

Medical education continues from undergraduate education to continuing professional development (CPD), with doctors working in various roles as practitioners, researchers, and teachers [1]. CPD responds not only to the development of the doctors' personal professional development, but also to the needs of patients, their families, and their community [2]. Family medicine and primary care are disciplines that provide long-term care centered on people of all ages and situations [3]. It is comprehensive, continuing from pre-natal care to palliative care [3]. No training program – regardless of its duration or content – can provide the postgraduate medical trainee with all competencies needed for primary care [3]. Primary care physicians need to commit to lifelong learning with a deliberate CPD plan to practice with an expert level of clinical skills [4].

General practitioners (GPs) in Japan may become family practitioners or hospitalists [5]. Approximately one-third of physicians in Japan are in charge of primary care at their own private clinic after 5–10 years of specialist practice training at university hospitals or city general hospitals [6]. Many physicians do not have public primary care training but independently undertake learning and training in this area. Unlike physicians in many other countries, they do not need to participate in a specific CPD program on primary care to maintain licensure [7]. The Japan Primary Care Association, established in 2010, is responsible for board certification of senior residents who complete their training program [5, 8]. The Japanese Medical Specialty Board (distinct from the Japan Primary Care Association) was newly established in 2017 to manage the certification of GPs in Japan [5]. Board-certified GPs were recognized as a new specialist category under a board certification senior resident training program that began in 2018 [8, 9]. Although an education program for senior residents is now in place, educational support for veteran primary care physicians, whose training was focused on specific organ systems, is inadequate. Therefore, we consider that the CPD of primary care physicians in Japan should be supported.

In April 2016, we started a 2-year Family Medicine Brush-up Program, which is an interactive CPD program for primary care physicians with a problem-based learning (PBL) approach. The program aimed to enable participants to discuss and learn about issues encountered in primary care by studying scenarios based on themes such as those found in Appendix 1 [10]. Through the program, we aimed to develop the ability to identify problems in the practice of medicine and to continue learning to solve them. The PBL approach allows learners to actively participate in group activities and helps learners develop into reflective practitioners [11]. The field of primary care is fraught with complex problems and uncertainties that make it difficult to arrive at a single correct management pathway [12]. We believe that primary care physicians who grow through repeated reflection have a strong affinity with lifelong learning, and for this reason we have adopted the PBL approach for this program. We conducted a qualitative study to clarify participants' training needs and

inform the program content [10]. Three categories of participant statements were established: "no standard re-education program for primary care physicians to respond to changes in the clinical and practice setting," "problems with undergraduate and postgraduate medical education in primary care," and "content of primary care CPD" [10]. This study led to the need to examine the changes that participants experienced as a result of the program [10]. After the 2-year program that started in 2016 was completed, we considered evaluating the program to see how the participants had changed.

The Kirkpatrick model is used to evaluate educational programs, including CPD programs such as our Family Medicine Brush-up Program [1, 13]. The model focuses on the outcomes of the program, not just learner satisfaction [14]. The Kirkpatrick model was proposed in the 1950s, and a modified model (The New World Kirkpatrick model) was introduced in the 2000s [13]. The model consists of four levels [1, 11]. Level 1 is reaction and satisfaction: Do learners respond favorably to the program? Level 2 is learning measures: Do learners acquire the intended knowledge? Level 3 is behavioral change: Do learners apply what they learned? Level 4 is results and impact: Do the expected outcomes occur? [1, 13, 14]. The evaluation of how the participants' learning changed is equivalent to level 3 in this model. Related to the evaluation of level 3 in this model, a review by Samuel et al. reported outcomes that affected health care practitioners' behavioral changes and patient outcomes [15]. In this review, changes in prescribing patterns and modification of test ordering behavior are discussed in terms of level 3 outcomes [15]. Most of the findings reported at level 4 of the Kirkpatrick model were not statistically significant [15]. Online learning, e-learning, and computer-aided learning are reported as effective modalities for CPD to achieve the learning objectives, and interventions such as lectures, interactive sessions, audits, and feedback were also used [15]. In terms of the educational approach used in CPD, Al-Azri et al. and Dowling et al. reported that a PBL approach can improve physicians' performance and patient care [16, 17]. A variety of modalities and interventions have been used for CPD [15]. Traditional face-to-face lectures are preferred by many participants, and there are no set recommendations for CPD modalities and interventions [15]. It is also unclear whether participation in our program yields the same changes in learners as those reported in previous studies.

Therefore, we surveyed participants in our program to examine the changes they experienced in their attitudes to learning, corresponding to Kirkpatrick level 3. It is helpful to use an interview survey and portfolio to evaluate the behavioral change corresponding to level 3 of this model [1, 13]. To elicit detailed insights from individual participants, we chose to conduct a qualitative study based on interviews with participants, aiming to clarify how our program changed their attitudes to learning.

METHODS

Study design and participants

On completion of the program (January 2018), we conducted a single focus group interview with program participants to investigate the changes that had occurred during the program. Interviews are considered effective for assessing changes in behavior and correspond to Kirkpatrick level 3 [1].

Eight participants completed the Family Medicine Brush-up Program targeting physicians who had not undertaken specialist training in family medicine and had qualified at least 10 years previously. The interview was conducted at the end of the program with the eight physicians (A–H, Table 1). This study was approved by the Institutional Review Board of the Jikei University School of Medicine (Study number: 27-277[8162]). All participants provided written informed consent to participate in this study. The results were presented following the COREQ guidelines for reporting qualitative studies [18] (Appendix 2).

Table 1. Attributes of participants

	Age	Sex	Setting	Medical specialty
A	50s	M	Private clinic	Cardiology
B	40s	M	Private clinic	Emergency medicine
C	30s	M	City general hospital	Rheumatology and connective tissue disease
D	30s	F	City general hospital	Internal medicine
E	30s	F	Private clinic	General medicine and primary care
F	40s	F	University hospital	General medicine and primary care
G	40s	M	City general hospital	Internal medicine
H	40s	F	Private clinic	Anesthesiology

Data collection

The participants received an explanation of how the interview would be recorded and conducted, and consented to be interviewed. The focus group interview was conducted with the

guiding questions: 1) “What kind of changes do you have in your awareness and behavior after taking this program?”; and 2) “Do you notice any change in the behavior or attitude of staff at your workplace?”

The participants were interviewed in a quiet room undisturbed by daily activities, using a digital recorder. Three authors (MS, YF, and TJ), all primary care physicians, managed the interviews. In this study, we considered it important to use and analyze the interactions generated by group discussions, and adopted the focus group interview method. Focus group interviews are also suitable for investigating attitudes and experiences [19, 20]. This method is reported to encourage people to talk about difficult content and voice critical opinions [19, 20]. In such cases, rather than having a third party act as an interviewer, the authors who run the program and facilitate the participants can act as interviewers to promote group dynamics and elicit discussions among the participants. Therefore, the authors acted as interviewers for the focus group interviews. YF had the most experience with interviewing and was therefore the main interviewer, with MS and TJ assisting. These three authors had also managed the program and facilitated the participants’ learning over the past 2 years.

The interview time was set at 60 minutes. When one participant responded to a question, several others typically added their opinions. YF asked all the participants questions using the guide questions in chronological order and encouraged participants with relatively few responses to provide additional opinions. In actuality, the interview took 72 minutes. At that point, the interviewer decided that theoretical saturation had been achieved without any further opinions from the participants.

Data analysis

We analyzed the interview records with the Steps for Coding and Theorization (SCAT) method, which is a grounded theory-based thematic analysis approach. SCAT is an analytical method that adds codes in a four-step process, from raw interview data to themes (Table 2) [21, 22, 23]. We used this method when conducting a previous study on the needs of participants for the program [10]. SCAT is suitable for the analysis of relatively small samples, such as those used in the previous study, and it was considered appropriate to use SCAT for this study with a similarly small sample [21, 23]. The SCAT method improves reflexivity by looking back at each step, and can be expected to improve the possibility of falsifiability by clarifying the analysis process [21, 22, 23]. Therefore, the SCAT method was selected as the analysis method of this study. Using the tape transcript, two authors (MS and TJ) independently coded the text for SCAT steps 1 to 3 [21, 23]. The two authors conferred on conflicting opinions about the content of the code until they reached a joint consensus. Three authors (MS, TJ, and HO) independently conducted the coding for SCAT step 4 [21, 23]. The three authors again conferred and agreed on common themes and constructs about the content of the code.

Table 2. Four steps following the SCAT (Steps for Coding and Theorization) method

	Analysis procedure	Examples
Step 0	Raw interview data	"I was able to learn systematically, not only biomedical issues but also psychosocial ones, by finding learning topics in scenarios, searching for literature, and considering it logically."
Step 1	Notable words in step 0	"learn systematically," "biomedical issues," "psychosocial ones," "searching for literature," "consider logically"
Step 2	Words that are not in the data to paraphrase step 1	Principles of family medicine, critical thinking
Step 3	Words to explain step 2	Experience of being able to apply evidence-based learning methods that were applicable to biological problems to psychosocial problems
Step 4	Themes and constructs that emerge from step 3	Changes in learning methods regarding medical practice

Patient and public involvement

There was no patient or public involvement in the design or implementation of this study.

RESULTS

Although our program took place over 2 years with nine participants enrolled, one participant dropped out after only 1 year because of changes in the participant's medical practice hours. Eight persons completed this program, and all agreed to participate in the interview. The participants' interview records were organized into three categories: "changes in learning methods regarding medical practice," "encounters with diverse perspectives and values, and confidence gained from those encounters," and "showing one's attitude towards learning and its influence on others" (Table 3). This section presents excerpts from focus group interviews on these categories.

Table 3. Themes and constructs about changes in behaviors

Themes and constructs	Phrases
Changes in learning methods regarding medical practice	Search for material and literature, psychosocial problem
Encounters with diverse perspectives and values, and confidence gained from those encounters	Confidence, no judgment attitude for another's opinion, tolerance of diversity, loneliness about own practice, no standard re-education program
Showing one's attitude towards learning and its influence on others	Active transformation of colleagues' learning motivation

Changes in learning methods regarding medical practice

The phrases "search for material and literature" and "psychosocial problem" came from a collection of opinions on this theme.

Search for material and literature:

Participants in the program had the opportunity to relearn the practice they normally engage in.

"I had never given much thought to my routine practice before, but the program made me dig deeper again into questions such as what guidelines said and what kind of literature there was." (B)

Participants emphasized that they searched for raw data, such as statistical data about their learning tasks.

"Now I search not only for secondary materials but also primary materials." (C, D)

The content of the program, which is to study and discuss the learning topics, has led to changes in search methods.

"All of us in the program gave presentations and had discussions based on statistics we looked up for ourselves." (G)

Psychosocial problem:

Participants had little experience searching the literature for psychosocial factors.

"I was able to learn systematically, not only biomedical issues but also psychosocial ones, by finding

learning topics in scenarios, searching for literature, and considering it logically." (A)

Encounters with diverse perspectives and values, and confidence gained from those encounters

The phrases "confidence", "no judgment attitude for another's opinion", "tolerance of diversity", "loneliness about own practice", "no standard re-education program" came from a collection of opinions on this theme.

Confidence, no judgment attitude for another's opinion:

Setting the learning task in the discussion between the participants led to confidence in the presentation and prevented the attitude of judging the presentation to be correct or incorrect.

"I felt like I would be judged for my presentation, but there was no critical atmosphere around presentations at all. It was an environment where I could research my learning topic freely and get feedback from everyone." (D)

Tolerance of diversity:

It is important to understand diversity and not to judge the correct answer or the error unequivocally. The participating doctors also felt this way.

"I recognized that it's not really about whether someone is right or wrong, but that maybe there can be all kinds of physicians." (E)

No standard re-education program:

The lack of a standard re-education program has led to the burden of engaging in the field of primary care while still immature. It is difficult for such a practitioner to notice the connection.

"I dove right into practicing family medicine without training in it. I had no confidence in myself, and I worried about what I should do and how I should study. The first thing that changed in me through participating in this program was meeting all kinds of physicians and encountering many ways of living. The program reminded me of the truth of how enjoyable it is to learn, even though my daily work as a physician is overwhelming, to think hard about my next own learning topic and compare it with what I actually see in my own patients." (H)

Loneliness about own practice:

The loneliness of the participants was due to the fact that they were placed in managerial or administrative positions in the clinic, and it was difficult to find a place to learn with other medical practitioners due to their solo practice.

"In the clinic, in my position as the manager, even when I get lonely or worry about my relationships

with my staff, I have no one to turn to for advice where my clinic is located. The only choice I ever had was to sort things out in my own head. However, by going to a place far away from my clinic and opening up to the people I met there, I learned that I'm not the only one who feels lonely." (H)
Participants felt less lonely, and dealing with diversity allowed them to open up. As a result, the participants realized the depth of their learning.

"I have the impression that the level of learning varies quite a bit depending on how much someone opens themself up." (C)

Showing one's attitude towards learning and its influence on others

The phrase "active transformation of colleagues' learning motivation" was contained in this theme.
Active transformation of colleagues' learning motivation:
Showing a learning attitude is linked to the learning motivation of other colleagues.

"My staff told me that seeing me hard at work researching issues between examinations showed them that it's possible to learn even when you're busy. They said that when they saw how I studied, it made them want to work harder too." (H)
Showing colleagues the learning content increases their motivation to learn. Presenting the learning content is not about planning a study session for colleagues.

"I now make it a point to tell all of my staff everything I learned about in this program. I make sure to jot down what I learned and put it up in the meeting room." (A)
Having colleagues know what the participants have learned is linked not only to their motivation for learning but also to their behavior related to actual medical care.

"For instance, I have the staff at my clinic actually write out genograms based on what I learn from my patients. I think it's given my staff the ability to look at things from the perspective of the families and lifestyles of our patients." (A)

DISCUSSION

The first behavioral change that emerged in the participants' statements was a change in learning method. One participant stated that their literature searches and logical reasoning had changed regarding not only biological issues, but also psychosocial issues. Psychosocial problem-solving is a core competence in family medicine and primary care [24]. The participants in our program have a great deal of practical experience as specialists of different organs and are well-versed in literature

searches and logical reasoning for biological issues. In addition to this capacity, our results suggested that completing our program may help participants acquire literature search and logical reasoning capacities for psychosocial issues.

The second behavioral change that emerged was related to encounters with diverse perspectives and values and the confidence gained from those encounters. As previous studies have found, the absence of re-education programs often leads to learning in a solitary environment [6, 25]. In Japan, many private physicians engaged in primary care have solo practices [26]. By providing participants with an arena for learning, our program may have encouraged positive changes in the participants' attitudes. Providing an arena for learning and forming a learning community may be important, regardless of learning style. Further study is necessary to determine whether confidence, a specific change in the participants' attitudes, results from the PBL approach.

Participants spoke favorably about our program being held away from the locations where they practice. However, for physicians in rural areas, traveling to such programs is often considered an obstacle to participation [17]. Holding programs online facilitates participation from remote areas. In comparisons of online and on-site education, results are mixed [27]. One participant in the present study stated that it is difficult to consult with other medical professionals in her own community about issues encountered with patients. For learning about content highly relevant to the participants' practices, providing a learning community away from the areas where they practice may foster better learning. However, given the current COVID-19 pandemic, hosting the program online would reduce the risk of infection. Additionally, health care utilization in Japan has changed. Aoki et al. highlighted the need to strengthen primary care functions such as support for populations with social isolation and multimorbidity [28]. Further research should consider changing the program to an online format and modifying the primary care learning topics to be covered.

One participant in our study noted that discussions regarding the results of learning topics and participants' practices and values did not lead to a judgmental atmosphere. A positive atmosphere in classes and groups is considered to bring about cooperative learning, while positive discussions and a learner culture are thought to diversify learning, encourage flexible thinking, and increase creativity [29]. In East Asia, the learning style in medical education is based on Confucian culture [30]. The communication style is expressed as "cultural reticence" [31] – a tendency to not actively express what you know or feel [31]. Relevant to the comment that the level of learning may change depending on the degree to which someone opens themself up, the facilitator of learners' presentations and discussions may need skills to provide the learners with a safe discussion atmosphere in which the learners' presentations are not judged as right or wrong and which promotes self-disclosure. Currently, no formal training exists for such facilitators. Going forward, training to help facilitators promote discussion should be conducted while the program is administered.

The last behavioral change was the influence on others. A present study suggests that

program participants can promote a positive attitude towards learning in their workplace staff and others around them by demonstrating their own positive attitude towards learning and sharing what they have learned [32]. In East Asia, where Confucian influences are strong, students respect teachers, learn from them, and imitate their attitudes [30]. Such a cultural background may also improve the learning attitude of the workplace staff. However, it is unclear whether staff actually put their learning into practice in patient care. Further examination of the effects of learning programs will require surveys of the participants' staff and confirmation of changes in patient care.

The Kirkpatrick model was used to evaluate this program [14]. This model is useful because of its clarity in focusing on program outcomes and its clear description of outcomes beyond simple learner satisfaction [14]. However, this model on its own does not provide educators with a complete evaluation of their educational programs [14, 33]. The model has been criticized on the grounds that it does not include intervening variables, such as motivation and learner's entry level, and the relationship between program elements and context [14, 34, 35]. In this interview, a participant commented on the importance of a non-judgmental atmosphere. It is necessary to investigate the intervening variables that have affected prior learning, and then conduct interviews with the intervening variables in mind regarding changes in behavior in the study group.

In terms of the three changes in attitude, we will consider whether attending this program was an effective learning exercise for the participants. The FAIR principles (Feedback, Activity, Individualization, and Relevance) are known to be associated with effective learning [36]. The points of Activity and Individualization are achieved by the use of small groups and a learning strategy in which the learner selects the learning theme using the PBL approach. In addition, the point of Relevance is also satisfied by using a scenario that assumes the site of primary care. Under the conditions of a solo medical practice and learning environment, and with self-judgment of the correctness of learning tasks, appropriate feedback cannot be obtained from facilitators and other participants. The interview results suggest that participating with confidence among participants with a diverse set of values in a non-judgmental environment provided sufficient feedback. Additionally, providing appropriate feedback is one of the competencies required as an educator [37]. Acting as a facilitator is one of the twelve roles of the educator, and feedback is included in this role. The third attitude change applies to participants being viewed as role models. Studying in this program may also enhance participants' ability to support other learners as a faculty member. By observing how participants behave as facilitators or role models in clinical and learning settings, it may be possible to assess level 4 stages of the Kirkpatrick model for this program. This aspect could be a subject for future research. The Kirkpatrick model was used to evaluate this program, but we aimed for an evaluation that went beyond the satisfaction of taking the course. For this reason, the evaluation was set at level 3 instead of 1 or 2. However, we did not evaluate the level 4 stage, which extends to how the program affected patients. Measuring outcomes in terms of patient health and medical economy

may be a future research topic for the CPD program. This would require a survey of individual patients' illnesses and health conditions, as well as a survey of management conditions. The outcomes should also investigate what changes have occurred in the staff of the medical institutions to which the participants belong, using the participants as role models.

Limitations

The interview in the present study may not necessarily reflect all changes in the attitudes to learning among the program participants. It would also have been helpful to include the views of the participant who did not complete the program.

This study is an analysis of a single focus group interview with all participants who completed the program. Although the participants are experienced primary care physicians, they do not all have the same level of medical competence and knowledge on the themes of health problems that are addressed in primary care. In addition, the level of their medical skills and knowledge was not verified beforehand. It is possible that changes in the learning attitude of each participant may have been overestimated or underestimated. Future research will require multiple focus groups with larger numbers of participants divided by their subspecialty.

The interview was conducted by facilitators who had been involved with the program for its 2-year duration. Close involvement in the learning process may have enabled the facilitators to encourage deeper discussion than an interviewer without such involvement. Conversely, the involvement of the interviewers in the learning process may have influenced the discussion about the effective outcomes of the program, as participants might not have wanted to offend the facilitators.

CONCLUSIONS

This study confirmed that participation in our 2-year CPD program changed participants' learning attitudes and education-related behavior. Our results suggest that support of CPD for primary care physicians requires the preparation of a learning community based on diverse values and perspectives, and the capacity for facilitation to foster the learning community.

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STATEMENTS

Contributors

MS conceived the study, contributed to the development of its design, received the JSPS KAKENHI grant, collected the data, and analyzed the qualitative data. YF conceived the study, contributed to the development of the design, and interviewed the participants. MM conceived the study, contributed to the design, and facilitated the focus group interview. TJ facilitated the focus group interview and analyzed the qualitative data. HO analyzed the qualitative data and contributed to the design. YM, IO, and JH conceived the study and contributed to the design. All authors contributed to the drafting of the manuscript, and read and approved the final manuscript.

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Competing interests

MM received lecture fees and lecture travel fees from the Centre for Family Medicine Development of the Japanese Health and Welfare Co-operative Federation. MM is an adviser for the Centre for Family Medicine Development Practice-Based Research Network. The other authors report no conflicts of interest.

Patient consent for publication

Not required

Ethics approval

This study was approved by the Institutional Review Board of the Jikei University School of Medicine (Study number: 27-277[8162]).

Provenance and peer review

Not commissioned; externally peer reviewed.

Data availability statement

Because of the nature of this study, participants did not agree that their data could be shared publicly, so supporting data are not available.

APPENDIX 1

Primary care themes covered in the Family Medicine Brush-up Program

I. Typical health problems in primary care

Child – old age care	Palliative care	Women's health
Rehabilitation	Mental health problems	Vaccination
Chinese medicine	Common emergencies	Musculoskeletal problem
Surgery	Ophthalmology	Otorhinolaryngology

II. The principles of family medicine

Patient-centered clinical method	Family-oriented care	
Biopsychosocial model	Interprofessional work	
Prevention and health promotion	Ethics and law	Patient-clinician relationship
Healthcare context and continuity	Behavior modification	
Complexity and uncertainty	Reflective learning	

III. Interpersonal and communication skills

Medical interview	Laboratory tests in the clinic
Clinical problem solving	Evidence-based medicine
Professionalism	Minorities and socially vulnerable
Facility management	Practice guidelines

APPENDIX 2

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

No	Item	Guide questions/description	
Domain 1: Research team and reflexivity			
Personal Characteristics			
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group?	Yasuki Fujinuma conducted the focus group interview. Masayasu Seki and Tatsuhiro Joki assisted. Page 7.
2.	Credentials	What were the researchers' credentials? *E.g., PhD, MD*	Masayasu Seki, MD, PhD Yasuki Fujinuma, MD Masato Matsushima, MD, PhD, MPH Tatsuhiro Joki, MD, PhD Hideo Okonogi, MD, PhD Yasuhiko Miura, MD, PhD Jun Hiramoto, MD, PhD Iwao Ohno, MD, PhD. Page 1.

No	Item	Guide questions/description	
3.	Occupation	What was their occupation at the time of the study?	All researchers were primary care physician. Page 1.
4.	Gender	Was the researcher male or female?	All researchers were male. Page 1.
5.	Experience and training	What experience or training did the researcher have?	We conducted this research using the same analysis as for a previous study. Page 4.
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Participants were interviewed after taking the Family Medicine Brush-up Program for two years. Interviewers facilitated the program. Page 4, 5, 6.
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e.*g.*,	The participants received an explanation of the taped focus group interview process and gave their consent to participate. Page 5, 6, 7.

No	Item	Guide questions/description	
		personal goals, reasons for doing the research	
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g., *Bias, assumptions, reasons and interests in the research topic*	The main interviewer (Yasuki Fukunuma) was practicing primary care and was engaged in research and education activities in family medicine. Page 7.
Domain 2: study design			
Theoretical framework			
9.	Methodological orientation and theory	What methodological orientation was stated to underpin the study? *e.g., grounded theory, discourse analysis, ethnography,*	We analyzed the interview records with the Steps for Coding and Theorization (SCAT) method, which is a grounded theory-based thematic analysis approach. This method is suitable for the analysis of relatively small samples. The SCAT method improves reflexivity by looking back each

No	Item	Guide questions/description	
		phenomenology, content analysis	steps, and can be expected to improve the possibility of falsifiability by clarifying the analysis process. Page 7, 8.
Participant selection			
10.	Sampling	How were participants selected? *e.g., purposive, convenience, consecutive, snowball*	Participants were all those who had completed the two-year program. Page 5, 6.
11.	Method of approach	How were participants approached? e*.g., face-to-face, telephone, mail, email*	Face-to-face. Page 6, 7.
12.	Sample size	How many participants were in the study?	8 participants. Page 5, 6.
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	None. Page 5, 6.

No	Item	Guide questions/description	
Setting			
14.	Setting of data collection	Where was the data collected? e.*g., home, clinic, workplace*	The participants were interviewed in a quiet room undisturbed by daily activities. Page 7.
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	No. Page 6, 7.
16.	Description of sample	What are the important characteristics of the sample? *e.g., demographic data, date*	Eight participants completed the Family Medicine Brush-up Program targeting physicians who had not undertaken specialist training in family medicine and had qualified at least 10 years previously. Page 5, 6.
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	The interview was conducted using the guiding questions and was not pilot tested. Page 6, 7.

No	Item	Guide questions/description	
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	A single focus group interview was conducted. Page 5, 6.
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data?	The interview was audio-recorded using a digital recorder. Page 5, 6.
20.	Field notes	Were field notes made during and/or after the interview or focus group?	Yes. Page 6, 7.
21.	Duration	What was the duration of the interviews or focus group?	72 minutes. Page 7.
22.	Data saturation	Was data saturation discussed?	Saturation was defined as the point with no new comments from the participants. Page 7.
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No. Page 7.

No	Item	Guide questions/description	
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	Two. Page 7.
25.	Description of the coding tree	Did authors provide a description of the coding tree?	Yes (see results). Page 7, 8.
26.	Derivation of themes	Were themes identified in advance or derived from the data?	Themes were derived from the data. Page 7, 8.
27.	Software	What software, if applicable, was used to manage the data?	Not applicable. Page 7.
28.	Participant checking	Did participants provide feedback on the findings?	No. Page 7.

No	Item	Guide questions/description	
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes/ findings? Was each quotation identified? e.*g.*, *participant number*	Yes, quotations are presented and identified. Page 8, 9.
30.	Data and findings consistent	Was there consistency between the data presented and the findings?	Yes. Page 8, 9, 10, 11.
31.	Clarity of major themes	Were major themes clearly presented in the findings?	Yes. Page 8, 9.
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Yes. Page 8, 9, 10, 11.

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No	Item	Guide questions/description	
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Use of a 2-year continuing professional development program to change Japanese physicians' attitudes to learning primary care: a qualitative study

Masayasu Seki[1]*, Yasuki Fujinuma[2, 3], Masato Matsushima[4], Tatsuhiro Joki[1], Hideo Okonogi[5], Yasuhiko Miura[1], Iwao Ohno[1], Jun Hiramoto[1]

[1]Division of General Medicine, Department of Internal Medicine, The Jikei University School of Medicine, Tokyo, Japan

[2]Centre for Family Medicine Development, Japanese Health and Welfare Co-operative Federation, Tokyo, Japan

[3]Seikyo-ukima Clinic, Japanese Health and Welfare Co-operative Federation, Tokyo, Japan

[4]Division of Clinical Epidemiology, The Jikei University School of Medicine, Tokyo, Japan

[5]Division of Nephrology and Hypertension, Department of Internal Medicine, The Jikei University School of Medicine, Tokyo, Japan

*Corresponding author:

Masayasu Seki, MD, PhD

Lecturer

Division of General Medicine, Department of Internal Medicine, The Jikei University School of Medicine, 3-25-8 Nishi-shimbashi, Minato-ku, Tokyo 105-8461, Japan

Email: masayasu-seki@jikei.ac.jp

Tel.: +81-3-3433-1111

Fax.: +81-3-5400-1267

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ABSTRACT

Objective

To evaluate changes in the learning attitudes of primary care physicians.

Design

Qualitative study through one focus group interview with the program's participants. Analysis of the focus group content using the Steps for Coding and Theorization (SCAT) method.

Setting

Japan.

Participants

Eight primary care physicians who completed a 2-year continuing professional development (CPD) program using a problem-based learning (PBL) approach, focused on acquiring the skills needed to practice as primary care physicians in the community.

Results

Participants described positive changes in their attitudes and behaviors as a result of the training program. These changes were grouped into three main themes: "changes in learning methods regarding medical practice," "encounters with diverse perspectives and values, and confidence gained from those encounters," and "showing one's attitude towards learning and its influence on others." The experienced practitioners participating in this study reported that the program helped them apply their skills more broadly; for example, searching the literature for psychosocial aspects of practice and engaging more comfortably with diverse perspectives. They reported the positive impact of their learning on their co-workers.

Conclusion

A 2-year CPD program using PBL can influence primary care physicians' attitudes and learning-related behaviors. Further research is needed to determine which specific aspects of the program are the most effective and whether the changes in attitudes and behaviors described affect patient care.

KEYWORDS: primary care, learning attitudes, qualitative, continuing professional development (CPD), problem-based learning.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This study examined changes in learning attitudes (Kirkpatrick model level 3) among primary care physicians and the impact of the changes on other staff (Kirkpatrick level 4) following a 2-year CPD program.
- This study had a small sample size and was a single focus group interview conducted in 2018.
- It is unclear whether changes in learning attitudes among participants have led to improved quality of patient care.
- Bias may have occurred because of the fact that the program facilitator was the main interviewer.

INTRODUCTION

Medical education continues from undergraduate education to continuing professional development (CPD), with doctors working in various roles as practitioners, researchers, and teachers [1]. CPD responds not only to the development of the doctors' personal professional development, but also to the needs of patients, their families, and their community [2]. Family medicine and primary care are disciplines that provide long-term care centered on people of all ages and situations [3]. It is comprehensive, continuing from pre-natal care to palliative care [3]. No training program – regardless of its duration or content – can provide the postgraduate medical trainee with all competencies needed for primary care [3]. Primary care physicians need to commit to lifelong learning with a deliberate CPD plan to practice with an expert level of clinical skills [4].

General practitioners (GPs) in Japan may become family practitioners or hospitalists [5]. Approximately one-third of physicians in Japan are in charge of primary care at their own private clinic after 5–10 years of specialist practice training at university hospitals or city general hospitals [6]. Many physicians do not have public primary care training but independently undertake learning and training in this area. Unlike physicians in many other countries, they do not need to participate in a specific CPD program on primary care to maintain licensure [7]. The Japan Primary Care Association, established in 2010, is responsible for board certification of senior residents who complete their training program [5, 8]. The Japanese Medical Specialty Board (distinct from the Japan Primary Care Association) was newly established in 2017 to manage the certification of GPs in Japan [5]. Board-certified GPs were recognized as a new specialist category under a board certification senior resident training program that began in 2018 [8, 9]. Although an education program for senior residents is now in place, educational support for veteran primary care physicians, whose training was focused on specific organ systems, is inadequate. Therefore, we consider that the CPD of primary care physicians in Japan should be supported.

In April 2016, we started a 2-year Family Medicine Brush-up Program, which is an interactive CPD program for primary care physicians with a problem-based learning (PBL) approach. The program aimed to enable participants to discuss and learn about issues encountered in primary care by studying scenarios based on themes such as those found in Appendix 1 [10]. Through the program, we aimed to develop the ability to identify problems in the practice of medicine and to continue learning to solve them. The PBL approach allows learners to actively participate in group activities and helps learners develop into reflective practitioners [11]. The field of primary care is fraught with complex problems and uncertainties that make it difficult to arrive at a single correct management pathway [12]. We believe that primary care physicians who grow through repeated reflection have a strong affinity with lifelong learning, and for this reason we have adopted the PBL approach for this program. The PBL approach we used encompassed working in groups to discuss relevant, real problems. We conducted a qualitative study to clarify participants' training needs and

inform the program content [10]. Three categories of participant statements were established: "no standard re-education program for primary care physicians to respond to changes in the clinical and practice setting," "problems with undergraduate and postgraduate medical education in primary care," and "content of primary care CPD" [10]. . After the 2-year program that started in 2016 was completed, we considered evaluating the program to see how the participants had changed. We felt that the completion of the 2-year program by a number of participants was a good milestone to study the impact of the program on participants' attitudes toward learning primary care.

The Kirkpatrick model is used to evaluate educational programs, including CPD programs such as our Family Medicine Brush-up Program [1, 13]. The model focuses on the outcomes of the program, not just learner satisfaction [14]. The Kirkpatrick model was proposed in the 1950s, and a modified model (The New World Kirkpatrick model) was introduced in the 2000s [13]. The model consists of four levels [1, 11]. Level 1 is reaction and satisfaction: Do learners respond favorably to the program? Level 2 is learning measures: Do learners acquire the intended knowledge? Level 3 is behavioral change: Do learners apply what they learned? Level 4 is results and impact: Do the expected outcomes occur? [1, 13, 14]. The evaluation of how the participants' learning changed is equivalent to level 3 in this model. Related to this evaluation, a review by Samuel et al. reported outcomes that affected health care practitioners' behavioral changes [15]. In this review, changes in prescribing patterns and modification of test ordering behavior are discussed in terms of level 3 outcomes [15]. Most of the findings reported at level 4 of the Kirkpatrick model were not statistically significant [15]. The review found that reports were limited, and it was difficult to assess patient outcomes equivalent to level 4 from the CPD [15].

Online learning, e-learning, and computer-aided learning are reported as effective modalities for CPD to achieve the learning objectives, and interventions such as lectures, interactive sessions, audits, and feedback were also used [15]. In terms of the educational approach used in CPD, Al-Azri et al. and Dowling et al. reported that a PBL approach can improve physicians' performance and patient care [16, 17]. A variety of modalities and interventions have been used for CPD [15]. Traditional face-to-face lectures are preferred by many participants, and there are no set recommendations for CPD modalities and interventions [15]. It is also unclear whether participation in our program yields the same changes in learners as those reported in previous studies. We therefore needed to assess the perceived changes in learners after participating in our program and to discuss whether those changes were comparable with similar changes reported in previous studies.

We surveyed participants in our program to examine the changes they experienced in their attitudes to learning corresponding to Kirkpatrick level 3, and the impact of the changes on other staff present in the workplace, corresponding to Kirkpatrick level 4. It is helpful to use an interview survey and portfolio to evaluate the behavioral change corresponding to level 3 of this model [1, 13]. To elicit

detailed insights from individual participants, we chose to conduct a qualitative study based on interviews with participants, aiming to clarify how our program changed their attitudes to learning. We then used the interview with participants to investigate the impact of participants' changes on their immediate colleagues, corresponding to Kirkpatrick level 4.

METHODS

Study design and participants

On completion of the program (January 2018), we conducted a single focus group interview with program participants to investigate the changes that had occurred during the program. Interviews are considered effective for assessing changes in behavior corresponding to Kirkpatrick level 3 [1]. Interviews were also conducted with participants to investigate the impact on their immediate colleagues, which corresponds to Kirkpatrick level 4.

Eight participants completed the Family Medicine Brush-up Program targeting physicians who had not undertaken specialist training in family medicine and had qualified at least 10 years previously. The interview was conducted at the end of the program with the eight physicians (A–H, Table 1). This study was approved by the Institutional Review Board of the Jikei University School of Medicine (Study number: 27-277[8162]). All participants provided written informed consent to participate in this study. The results were presented following the COREQ guidelines for reporting qualitative studies [18] (Appendix 2).

Table 1. Attributes of participants

	Age	Sex	Setting	Medical specialty
A	50s	M	Private clinic	Cardiology
B	40s	M	Private clinic	Emergency medicine
C	30s	M	City general hospital	Rheumatology and connective tissue disease
D	30s	F	City general hospital	Internal medicine
E	30s	F	Private clinic	General medicine and primary care
F	40s	F	University hospital	General medicine and primary care

G	40s	M	City general hospital	Internal medicine
H	40s	F	Private clinic	Anesthesiology

Data collection

The participants received an explanation of how the interview would be recorded and conducted, and consented to be interviewed. The focus group interview was conducted with the guiding questions: 1) "What kind of changes do you have in your awareness and behavior after taking this program?"; and 2) "Do you notice any change in the behavior or attitude of staff at your workplace?"

The participants were interviewed in a quiet room undisturbed by daily activities, using a digital recorder. Three authors (MS, YF, and TJ), all primary care physicians, managed the interviews. In this study, we considered it important to use and analyze the interactions generated by group discussions, and adopted the focus group interview method. Focus group interviews are also suitable for investigating attitudes and experiences [19, 20]. This method is reported to encourage people to talk about difficult content and voice critical opinions [19, 20]. Interviewers need to establish a positive rapport quickly during in-depth interviews [19]. In response to the interviewer's questions, participants verbalize their own experiences. That verbalization builds on the interactions and social constructions created between the interviewer and the participant [21]. Based on this constructivism recognition, we considered that the authors, who ran the program and facilitated the participants, should act as interviewers, rather than having a third party involved. We felt that this would better promote group dynamics and elicit discussions among the participants [21]. Therefore, the authors acted as interviewers for the focus group interviews. YF had the most experience with interviewing and was therefore the main interviewer, with MS and TJ assisting. These three authors had also managed the program and facilitated the participants' learning over the past 2 years.

The interview time was set at 60 minutes. When one participant responded to a question, several others typically added their opinions. YF asked all the participants questions using the guide questions in chronological order and encouraged participants with relatively few responses to provide additional opinions. In actuality, the interview took 72 minutes. At that point, the interviewer decided that theoretical saturation had been achieved without any further opinions from the participants.

Data analysis

We analyzed the interview records with the Steps for Coding and Theorization (SCAT) method, which is a grounded theory-based thematic analysis approach. SCAT is an analytical method

that adds codes in a four-step process, from raw interview data to themes (Table 2) [22-24]. We used this method when conducting a previous study on the needs of participants for the program [10]. SCAT is suitable for the analysis of relatively small samples, such as those used in the previous study, and it was considered appropriate to use SCAT for this study with a similarly small sample [22, 24]. The SCAT method improves reflexivity by looking back at each step, and can be expected to improve the possibility of falsifiability by clarifying the analysis process [22-24]. Therefore, the SCAT method was selected as the analysis method of this study. Using the tape transcript, two authors (MS and TJ) independently coded the text for SCAT steps 1 to 3 [22, 24]. The two authors conferred on conflicting opinions about the content of the code until they reached a joint consensus. Three authors (MS, TJ, and HO) independently conducted the coding for SCAT step 4 [22, 24]. The three authors again conferred and agreed on common themes and constructs about the content of the code.

Table 2. Four steps following the SCAT (Steps for Coding and Theorization) method

	Analysis procedure	Examples
Step 0	Raw interview data	"I was able to learn systematically, not only biomedical issues but also psychosocial ones, by finding learning topics in scenarios, searching for literature, and considering it logically."
Step 1	Notable words in step 0	"learn systematically," "biomedical issues," "psychosocial ones," "searching for literature," "consider logically"
Step 2	Words that are not in the data to paraphrase step 1	Principles of family medicine, critical thinking
Step 3	Words to explain step 2	Experience of being able to apply evidence-based learning methods that were applicable to biological problems to psychosocial problems

Step 4	Themes and constructs that emerge from step 3	Changes in learning methods regarding medical practice

Patient and public involvement

There was no patient or public involvement in the design or implementation of this study.

RESULTS

Although our program took place over 2 years with nine participants enrolled, one participant dropped out after only 1 year because of changes in the participant's medical practice hours. Eight persons completed this program, and all agreed to participate in the interview. The participants' interview records were organized into three categories: "changes in learning regarding medical practice," "encounters with diverse perspectives and values, and confidence gained from those encounters," and "showing one's attitude towards learning and its influence on others" (Table 3). This section presents excerpts from focus group interviews on these categories.

Table 3. Themes and constructs about changes in behaviors

Themes and constructs	Phrases
I: Changes in learning regarding medical practice	I-i: Search for material and literature, I-ii: psychosocial problems
II: Encounters with diverse perspectives and values, and confidence gained from those encounters	II-i: Confidence, no judgment attitude for another's opinion, II-ii: tolerance of diversity, II-iii: no standard re-education program, II-iv: loneliness about own practice
III: Showing one's attitude towards learning and its influence on others	III-i: Active transformation of colleagues' learning motivation

I: Changes in learning regarding medical practice

This theme was subdivided into "search for material and literature (I-i)" and "psychosocial

problems (I-ii)". The participants talked about how they moved from investigating biomedical problems in their daily practice to investigating problems involving biomedical and psychosocial factors.

I-i: Search for material and literature

As primary care physicians, the participants are solving clinical problems related to individual patient consultations. They had few opportunities to reflect on their practice, such as the evidence behind their treatment choices.

"I had never given much thought to my routine practice before, but the program made me dig deeper again into questions such as what guidelines said and what kind of literature there was." (B)

Secondary materials were often used to search for evidence to support daily practice and to resolve clinical problems. A change in participants' learning occurred in their search for primary materials and raw data, such as statistical data about their learning tasks.

"Now I search not only for secondary materials but also primary materials." (C, D)

Searching for primary materials was a shift in attitude toward generating opinions based on the participants' own ideas, to present their findings to other participants for discussion.

"All of us in the program gave presentations and had discussions based on statistics we looked up for ourselves." (G)

I-ii: Psychosocial problems

Participants were experienced in searching mainly secondary materials about biomedical problems. However, they had limited experience in searching material for information about psychosocial problems. Participants' learning attitude toward problem solving for various clinical problems changed.

"I was able to learn systematically, not only biomedical issues but also psychosocial ones, by finding learning topics in scenarios, searching for literature, and considering it logically." (A)

II: Encounters with diverse perspectives and values, and confidence gained from those encounters

This theme was subdivided into "confidence, non-judgmental attitude about other's opinions (II-i)", "tolerance of diversity (II-ii)", "no standard re-education program (II-iii)" and "loneliness about own practice (II-iv)". Participants who were inexperienced in primary care and operated in isolation at their workplaces described how they had changed after attending the program.

Ii-i: Confidence, non-judgmental attitude about other's opinions

When presenting their ideas to others, participants were concerned that they would be judged on whether they were correct or incorrect in their presentations. However, the non-judgmental atmosphere supported participants' learning.

"I felt like I would be judged for my presentation, but there was no critical atmosphere around presentations at all. It was an environment where I could research my learning topic freely and get feedback from everyone." (D)

II-ii: Tolerance of diversity

The non-judgmental attitude was based on an attitude of respecting individual values and tolerating diversity. These attitudes also encouraged participants to use primary materials and express their own ideas.

"I recognized that it's not really about whether someone is right or wrong, but that maybe there can be all kinds of physicians." (E)

II-iii: No standard re-education program

One of the reasons participants lacked confidence in their own thinking and were afraid of being judged was that they had not received standard retraining in primary care. They gained knowledge and skills in primary care by attending the program, but also rediscovered the joy of learning through encounters with diverse values.

"I dove right into practicing family medicine without training in it. I had no confidence in myself, and I worried about what I should do and how I should study. The first thing that changed in me through participating in this program was meeting all kinds of physicians and encountering many ways of living. The program reminded me of the truth of how enjoyable it is to learn, even though my daily work as a physician is overwhelming, to think hard about my next own learning topic and compare it with what I actually see in my own patients." (H)

II-iv: Loneliness about own practice

Another reason for the lack of confidence and fear of judgment was the loneliness that participants felt in their daily practice. They were generally administrators in their own health care organizations and had no colleagues to talk to about various issues such as patient care, staff management and their own concerns. Encountering diverse values helped to alleviate this loneliness.

"In the clinic, in my position as the manager, even when I get lonely or worry about my relationships with my staff, I have no one to turn to for advice where my clinic is located. The only choice I ever had was to sort things out in my own head. However, by going to a place far away from my clinic and opening up to the people I met there, I learned that I'm not the only one who feels lonely." (H)

Participants felt less lonely, and dealing with diversity allowed them to open up. As a result, the participants realized the depth of their learning.

"I have the impression that the level of learning varies quite a bit depending on how much someone opens themself up." (C)

III: Showing one's attitude towards learning and its influence on others

This theme had only one subtheme, "active transformation of colleagues' learning motivation (III-i)". Participants saw their own learning change, gained confidence, and also shared their learning with their colleagues. Their own development led others to change too.

III-i: Active transformation of colleagues' learning motivation

Even without setting up a formalized learning session, showing a learning attitude is linked to the learning motivation of other colleagues.

"My staff told me that seeing me hard at work researching issues between examinations showed them that it's possible to learn even when you're busy. They said that when they saw how I studied, it made them want to work harder too." (H)

Showing colleagues the learning content increases their motivation to learn.

"I now make it a point to tell all of my staff everything I learned about in this program. I make sure to jot down what I learned and put it up in the meeting room." (A)

Based on the needs of the medical facility to which participants belong and the needs of their colleagues, the sharing of their learning content also led to changes in patient care.

"For instance, I have the staff at my clinic actually write out genograms based on what I learn from my patients. I think it's given my staff the ability to look at things from the perspective of the families and lifestyles of our patients." (A)

DISCUSSION

The first behavioral change that emerged in the participants' statements was a change in learning (Theme I). One participant stated that their literature searches and logical reasoning had changed regarding not only biological issues, but also psychosocial issues. Psychosocial problem-solving is a core competence in family medicine and primary care [25]. The participants in our program have a great deal of practical experience as specialists of different organs and are well-versed in literature searches and logical reasoning for biological issues. In addition to this capacity, our results suggested that completing our program may help participants acquire literature search and logical

reasoning capacities for psychosocial issues.

The second behavioral change that emerged was related to encounters with diverse perspectives and values and the confidence gained from those encounters (Theme II). As previous studies have found, the absence of re-education programs often leads to learning in a solitary environment [6, 26]. In Japan, many private physicians engaged in primary care have solo practices [27]. By providing participants with an arena for learning, our program may have encouraged positive changes in the participants' attitudes. Providing an arena for learning and forming a learning community may be important, regardless of learning style. Further study is necessary to determine whether confidence, a specific change in the participants' attitudes, results from the PBL approach.

Participants spoke favorably about our program being held away from the locations where they practice. However, for physicians in rural areas, traveling to such programs is often considered an obstacle to participation [17]. Holding programs online facilitates participation from remote areas. In comparisons of online and on-site education, results are mixed [28]. One participant in the present study stated that it is difficult to consult with other medical professionals in her own community about issues encountered with patients. For learning about content highly relevant to the participants' practices, providing a learning community away from the areas where they practice may foster better learning. However, given the current COVID-19 pandemic, hosting the program online would reduce the risk of infection. Additionally, health care utilization in Japan has changed. Aoki et al. highlighted the need to strengthen primary care functions such as support for populations with social isolation and multimorbidity [29]. Further research should consider changing the program to an online format and modifying the primary care learning topics to be covered.

One participant in our study noted that discussions regarding the results of learning topics and participants' practices and values did not lead to a judgmental atmosphere. A positive atmosphere in classes and groups is considered to bring about cooperative learning, while positive discussions and a learner culture are thought to diversify learning, encourage flexible thinking, and increase creativity [30]. In East Asia, the learning style in medical education is based on Confucian culture [31]. The communication style is expressed as "cultural reticence" [32] – a tendency to not actively express what you know or feel [32]. Relevant to the comment that the level of learning may change depending on the degree to which someone opens themself up, the facilitator of learners' presentations and discussions may need skills to provide the learners with a safe discussion atmosphere in which the learners' presentations are not judged as right or wrong and which promotes self-disclosure. Currently, no formal training exists for such facilitators. Going forward, training to help facilitators promote discussion should be conducted while the program is administered.

The last behavioral change was the influence on others (Theme III). A present study suggests that program participants can promote a positive attitude towards learning in their workplace staff and others around them by demonstrating their own positive attitude towards learning and sharing what

they have learned [33]. In East Asia, where Confucian influences are strong, students respect teachers, learn from them, and imitate their attitudes [31]. Such a cultural background may also improve the learning attitude of the workplace staff. However, it is unclear whether staff actually put their learning into practice in patient care. Further examination of the effects of learning programs will require surveys of the participants' staff and confirmation of changes in patient care.

In this interview, we explored the changes among staff at the participants' health care organizations, corresponding to Kirkpatrick level 4. However, it would be helpful to survey these staff to determine if the outcomes identified in the interviews actually occurred.

The Kirkpatrick model was used to evaluate this program [14]. This model is useful because of its clarity in focusing on program outcomes and its clear description of outcomes beyond simple learner satisfaction [14]. However, this model on its own does not provide educators with a complete evaluation of their educational programs [14, 34]. The model has been criticized on the grounds that it does not include intervening variables, such as motivation and learner's entry level, and the relationship between program elements and context [14, 35, 36]. In this interview, a participant commented on the importance of a non-judgmental atmosphere. It is necessary to investigate the intervening variables that have affected prior learning, and then conduct interviews with the intervening variables in mind regarding changes in behavior in the study group.

In terms of the three changes in attitude, we will consider whether attending this program was an effective learning exercise for the participants. The FAIR principles (Feedback, Activity, Individualization, and Relevance) are known to be associated with effective learning [37]. The points of Activity and Individualization were achieved by the use of small groups and a learning strategy in which the learner selects the learning theme using the PBL approach. These points are evident from both the observed change in attitude toward the learning group shown in Theme II and the change in learning shown in Theme I as a result of the learning environment. In addition, the point of Relevance is also satisfied by using a scenario that assumes the site of primary care. This was evident from the fact that the program became a place to learn about problems faced in clinical practice, as described in Theme II. Under the conditions of a solo medical practice and learning environment, and with self-judgment of the correctness of learning tasks, appropriate feedback cannot be obtained from facilitators and other participants. The interview results on Theme II suggest that participating with confidence among participants with a diverse set of values in a non-judgmental environment provided sufficient feedback. Additionally, providing appropriate feedback is one of the competencies required as an educator [38]. Acting as a facilitator is one of the twelve roles of the educator, and feedback is included in this role. The third attitude change in Theme III applies to participants being viewed as role models. Studying in this program may also enhance participants' ability to support other learners as a faculty member. By observing how participants behave as facilitators or role models in clinical and learning settings, it may be possible to assess level 4 stages of the Kirkpatrick model for this

program. This aspect could be a subject for future research. The Kirkpatrick model was used to evaluate this program, but we aimed for an evaluation that went beyond the satisfaction of taking the course. For this reason, the evaluation was set at level 3 instead of 1 or 2. However, we did not evaluate the level 4 stage, which extends to how the program affected patients. Measuring outcomes in terms of patient health and medical economy may be a future research topic for the CPD program. This would require a survey of individual patients' illnesses and health conditions, as well as a survey of management conditions. The outcomes should also investigate what changes have occurred in the staff of the medical institutions to which the participants belong, using the participants as role models.

Limitations

The interview in the present study may not necessarily reflect all changes in the attitudes to learning among the program participants. It would also have been helpful to include the views of the participant who did not complete the program.

This study is an analysis of a single focus group interview with all participants who completed the program. Although the participants are experienced primary care physicians, they do not all have the same level of medical competence and knowledge on the themes of health problems that are addressed in primary care. In addition, the level of their medical skills and knowledge was not verified beforehand. It is possible that changes in the learning attitude of each participant may have been overestimated or underestimated. Future research will require multiple focus groups with larger numbers of participants divided by their subspecialty.

The interview was conducted by facilitators who had been involved with the program for its 2-year duration. Close involvement in the learning process may have enabled the facilitators to encourage deeper discussion than an interviewer without such involvement. Conversely, the involvement of the interviewers in the learning process may have influenced the discussion about the effective outcomes of the program, as participants might not have wanted to offend the facilitators.

CONCLUSIONS

This study confirmed that participation in our 2-year CPD program changed participants' learning attitudes and education-related behavior. Our results suggest that support of CPD for primary care physicians requires the preparation of a learning community based on diverse values and perspectives, and the capacity for facilitation to foster the learning community.

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STATEMENTS

Contributors

MS conceived the study, contributed to the development of its design, received the JSPS KAKENHI grant, collected the data, and analyzed the qualitative data. YF conceived the study, contributed to the development of the design, and interviewed the participants. MM conceived the study, contributed to the design, and facilitated the focus group interview. TJ facilitated the focus group interview and analyzed the qualitative data. HO analyzed the qualitative data and contributed to the design. YM, IO, and JH conceived the study and contributed to the design. All authors contributed to the drafting of the manuscript, and read and approved the final manuscript.

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Competing interests

MM received lecture fees and lecture travel fees from the Centre for Family Medicine Development of the Japanese Health and Welfare Co-operative Federation. MM is an adviser for the Centre for Family Medicine Development Practice-Based Research Network. The other authors report no conflicts of interest.

Patient consent for publication

Not required

Ethics approval

This study was approved by the Institutional Review Board of the Jikei University School of Medicine (Study number: 27-277[8162]).

Provenance and peer review

Not commissioned; externally peer reviewed.

Data availability statement

Because of the nature of this study, participants did not agree that their data could be shared publicly, so supporting data are not available.

APPENDIX 1

Primary care themes covered in the Family Medicine Brush-up Program

I. Typical health problems in primary care

Child – old age care	Palliative care	Women's health
Rehabilitation	Mental health problems	Vaccination
Chinese medicine	Common emergencies	Musculoskeletal problem
Surgery	Ophthalmology	Otorhinolaryngology

II. The principles of family medicine

Patient-centered clinical method	Family-oriented care	
Biopsychosocial model	Interprofessional work	
Prevention and health promotion	Ethics and law	Patient-clinician relationship
Healthcare context and continuity	Behavior modification	
Complexity and uncertainty	Reflective learning	

III. Interpersonal and communication skills

Medical interview	Laboratory tests in the clinic
Clinical problem solving	Evidence-based medicine
Professionalism	Minorities and socially vulnerable
Facility management	Practice guidelines

APPENDIX 2

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

No	Item	Guide questions/description	
Domain 1: Research team and reflexivity			
Personal Characteristics			
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group?	Yasuki Fujinuma conducted the focus group interview. Masayasu Seki and Tatsuhiro Joki assisted. Page 7.
2.	Credentials	What were the researchers' credentials? *E.g., PhD, MD*	Masayasu Seki, MD, PhD Yasuki Fujinuma, MD Masato Matsushima, MD, PhD, MPH Tatsuhiro Joki, MD, PhD Hideo Okonogi, MD, PhD Yasuhiko Miura, MD, PhD Jun Hiramoto, MD, PhD Iwao Ohno, MD, PhD. Page 1.

No	Item	Guide questions/description	
3.	Occupation	What was their occupation at the time of the study?	All researchers were primary care physician. Page 1.
4.	Gender	Was the researcher male or female?	All researchers were male. Page 1.
5.	Experience and training	What experience or training did the researcher have?	We conducted this research using the same analysis as for a previous study. Page 4.
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Participants were interviewed after taking the Family Medicine Brush-up Program for two years. Interviewers facilitated the program. Page 4, 5, 6.
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e.*g.*,	The participants received an explanation of the taped focus group interview process and gave their consent to participate. Page 5, 6, 7.

No	Item	Guide questions/description	
		personal goals, reasons for doing the research	
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g., *Bias, assumptions, reasons and interests in the research topic*	The main interviewer (Yasuki Fukunuma) was practicing primary care and was engaged in research and education activities in family medicine. Page 7.
Domain 2: study design			
Theoretical framework			
9.	Methodological orientation and theory	What methodological orientation was stated to underpin the study? *e.g., grounded theory, discourse analysis, ethnography,*	We analyzed the interview records with the Steps for Coding and Theorization (SCAT) method, which is a grounded theory-based thematic analysis approach. This method is suitable for the analysis of relatively small samples. The SCAT method improves reflexivity by looking back each

No	Item	Guide questions/description	
		phenomenology, content analysis	steps, and can be expected to improve the possibility of falsifiability by clarifying the analysis process. Page 7, 8.
Participant selection			
10.	Sampling	How were participants selected? *e.g., purposive, convenience, consecutive, snowball*	Participants were all those who had completed the two-year program. Page 5, 6.
11.	Method of approach	How were participants approached? e*.g., face-to-face, telephone, mail, email*	Face-to-face. Page 6, 7.
12.	Sample size	How many participants were in the study?	8 participants. Page 5, 6.
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	None. Page 5, 6.

No	Item	Guide questions/description	
Setting			
14.	Setting of data collection	Where was the data collected? e.*g., home, clinic, workplace*	The participants were interviewed in a quiet room undisturbed by daily activities. Page 7.
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	No. Page 6, 7.
16.	Description of sample	What are the important characteristics of the sample? *e.g., demographic data, date*	Eight participants completed the Family Medicine Brush-up Program targeting physicians who had not undertaken specialist training in family medicine and had qualified at least 10 years previously. Page 5, 6.
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	The interview was conducted using the guiding questions and was not pilot tested. Page 6, 7.

No	Item	Guide questions/description	
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	A single focus group interview was conducted. Page 5, 6.
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data?	The interview was audio-recorded using a digital recorder. Page 5, 6.
20.	Field notes	Were field notes made during and/or after the interview or focus group?	Yes. Page 6, 7.
21.	Duration	What was the duration of the interviews or focus group?	72 minutes. Page 7.
22.	Data saturation	Was data saturation discussed?	Saturation was defined as the point with no new comments from the participants. Page 7.
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No. Page 7.

No	Item	Guide questions/description	
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	Two. Page 7.
25.	Description of the coding tree	Did authors provide a description of the coding tree?	Yes (see results). Page 7, 8.
26.	Derivation of themes	Were themes identified in advance or derived from the data?	Themes were derived from the data. Page 7, 8.
27.	Software	What software, if applicable, was used to manage the data?	Not applicable. Page 7.
28.	Participant checking	Did participants provide feedback on the findings?	No. Page 7.

No	Item	Guide questions/description	
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes/ findings? Was each quotation identified? e.*g.*, *participant number*	Yes, quotations are presented and identified. Page 8, 9.
30.	Data and findings consistent	Was there consistency between the data presented and the findings?	Yes. Page 8, 9, 10, 11.
31.	Clarity of major themes	Were major themes clearly presented in the findings?	Yes. Page 8, 9.
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Yes. Page 8, 9, 10, 11.

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No	Item	Guide questions/description	
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8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g., *Bias, assumptions, reasons and interests in the research topic*	The main interviewer (Yasuki Fukumuma) was practicing primary care and was engaged in research and education activities in family medicine. Page 7.
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Setting			
14.	Setting of data collection	Where was the data collected? e.*g., home, clinic, workplace*	The participants were interviewed in a quiet room undisturbed by daily activities. Page 7.
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Use of a 2-year continuing professional development program to change Japanese physicians' attitudes to learning primary care: a qualitative study

Masayasu Seki[1]*, Yasuki Fujinuma[2, 3], Masato Matsushima[4], Tatsuhiro Joki[1], Hideo Okonogi[5], Yasuhiko Miura[1], Iwao Ohno[1], Jun Hiramoto[1]

[1]Division of General Medicine, Department of Internal Medicine, The Jikei University School of Medicine, Tokyo, Japan

[2]Centre for Family Medicine Development, Japanese Health and Welfare Co-operative Federation, Tokyo, Japan

[3]Seikyo-ukima Clinic, Japanese Health and Welfare Co-operative Federation, Tokyo, Japan

[4]Division of Clinical Epidemiology, The Jikei University School of Medicine, Tokyo, Japan

[5]Division of Nephrology and Hypertension, Department of Internal Medicine, The Jikei University School of Medicine, Tokyo, Japan

*Corresponding author:

Masayasu Seki, MD, PhD

Lecturer

Division of General Medicine, Department of Internal Medicine, The Jikei University School of Medicine, 3-25-8 Nishi-shimbashi, Minato-ku, Tokyo 105-8461, Japan

Email: masayasu-seki@jikei.ac.jp

Tel.: +81-3-3433-1111

Fax.: +81-3-5400-1267

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ABSTRACT

Objective

To evaluate changes in the learning attitudes of primary care physicians.

Design

Qualitative study through one focus group interview with the program's participants. Analysis of the focus group content using the Steps for Coding and Theorization (SCAT) method.

Setting

Japan.

Participants

Eight primary care physicians who completed a 2-year continuing professional development (CPD) program using a problem-based learning (PBL) approach, focused on acquiring the skills needed to practice as primary care physicians in the community.

Results

Participants described positive changes in their attitudes and behaviors as a result of the training program. These changes were grouped into three main themes: "changes in learning methods regarding medical practice," "encounters with diverse perspectives and values, and confidence gained from those encounters," and "showing one's attitude towards learning and its influence on others." The experienced practitioners participating in this study reported that the program helped them apply their skills more broadly; for example, searching the literature for psychosocial aspects of practice and engaging more comfortably with diverse perspectives. They reported the positive impact of their learning on their co-workers.

Conclusion

A 2-year CPD program using PBL can influence primary care physicians' attitudes and learning-related behaviors. Further research is needed to determine which specific aspects of the program are the most effective and whether the changes in attitudes and behaviors described affect patient care.

KEYWORDS: primary care, learning attitudes, qualitative, continuing professional development (CPD), problem-based learning.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This study examined changes in learning attitudes (Kirkpatrick model level 3) among primary care physicians and the impact of the changes on other staff (Kirkpatrick level 4) following a 2-year CPD program.
- This study had a small sample size and was a single focus group interview conducted in 2018.
- It is unclear whether changes in learning attitudes among participants have led to improved quality of patient care.
- Bias may have occurred because of the fact that the program facilitator was the main interviewer.

INTRODUCTION

Medical education continues from undergraduate education to continuing professional development (CPD), with doctors working in various roles as practitioners, researchers, and teachers [1]. CPD responds not only to the development of the doctors' personal professional development, but also to the needs of patients, their families, and their community [2]. Family medicine and primary care are disciplines that provide long-term care centered on people of all ages and situations [3]. It is comprehensive, continuing from pre-natal care to palliative care [3]. No training program – regardless of its duration or content – can provide the postgraduate medical trainee with all competencies needed for primary care [3]. Primary care physicians need to commit to lifelong learning with a deliberate CPD plan to practice with an expert level of clinical skills [4].

General practitioners (GPs) in Japan may become family practitioners or hospitalists [5]. Approximately one-third of physicians in Japan are in charge of primary care at their own private clinic after 5–10 years of specialist practice training at university hospitals or city general hospitals [6]. Many physicians do not have public primary care training but independently undertake learning and training in this area. Unlike physicians in many other countries, they do not need to participate in a specific CPD program on primary care to maintain licensure [7]. The Japan Primary Care Association, established in 2010, is responsible for board certification of senior residents who complete their training program [5, 8]. The Japanese Medical Specialty Board (distinct from the Japan Primary Care Association) was newly established in 2017 to manage the certification of GPs in Japan [5]. Board-certified GPs were recognized as a new specialist category under a board certification senior resident training program that began in 2018 [8, 9]. Although an education program for senior residents is now in place, educational support for veteran primary care physicians, whose training was focused on specific organ systems, is inadequate. Therefore, we consider that the CPD of primary care physicians in Japan should be supported.

In April 2016, we started a 2-year Family Medicine Brush-up Program, which is an interactive CPD program for primary care physicians with a problem-based learning (PBL) approach. The program aimed to enable participants to discuss and learn about issues encountered in primary care by studying scenarios based on themes such as those found in Appendix 1 [10]. Through the program, we aimed to develop the ability to identify problems in the practice of medicine and to continue learning to solve them. Al-Azri et al. and Dowling et al. reported that a PBL approach can improve physicians' performance and patient care [11, 12]. The PBL approach allows learners to actively participate in group activities and helps learners develop into reflective practitioners [13]. The field of primary care is fraught with complex problems and uncertainties that make it difficult to arrive at a single correct management pathway [14]. We believe that primary care physicians who grow through repeated reflection have a strong affinity with lifelong learning, and for this reason we have adopted the PBL approach for this program. The PBL approach we used encompassed working in

groups to discuss relevant, real problems. We conducted a qualitative study to clarify participants' training needs and inform the program content [10]. Three categories of participant statements were established: "no standard re-education program for primary care physicians to respond to changes in the clinical and practice setting," "problems with undergraduate and postgraduate medical education in primary care," and "content of primary care CPD" [10]. After the 2-year program that started in 2016 was completed, we considered evaluating the program to see how the participants had changed. We felt that the completion of the 2-year program by a number of participants was a good milestone to study the impact of the program on participants' attitudes toward learning primary care.

The Kirkpatrick model is used to evaluate educational programs, including CPD programs such as our Family Medicine Brush-up Program [1, 15]. The model focuses on the outcomes of the program, not just learner satisfaction [16]. The Kirkpatrick model was proposed in the 1950s, and a modified model (The New World Kirkpatrick model) was introduced in the 2000s [15]. The model consists of four levels [1, 13]. Level 1 is reaction and satisfaction: Do learners respond favorably to the program? Level 2 is learning measures: Do learners acquire the intended knowledge? Level 3 is behavioral change: Do learners apply what they learned? Level 4 is results and impact: Do the expected outcomes occur? [1, 15, 16].

We surveyed participants in our program, which aimed to develop the the ability to identify problems in the practice of medicine and to continue learning to solve them, to examine the changes they experienced in their attitudes to learning corresponding to Kirkpatrick level 3, and the impact of the changes on other staff present in the workplace, corresponding to Kirkpatrick level 4. It is helpful to use an interview survey and portfolio to evaluate the behavioral change corresponding to level 3 of this model [1, 15]. To elicit detailed insights from individual participants, we chose to conduct a qualitative study based on interviews with participants, aiming to clarify how our program changed their attitudes to learning. We then used the interview with participants to investigate the impact of participants' changes on their immediate colleagues, corresponding to Kirkpatrick level 4.

METHODS

Study design and participants

On completion of the program (January 2018), we conducted a single focus group interview with program participants to investigate changes in behavior that had occurred during the program corresponding to Kirkpatrick level 3 and to investigate impacts on their immediate colleagues corresponding to Kirkpatrick level 4. Interviews are considered effective for assessing these changes in behavior and their impacts [1].

Eight participants completed the Family Medicine Brush-up Program targeting physicians who had not undertaken specialist training in family medicine and had qualified at least 10 years

previously. The interview was conducted at the end of the program with the eight physicians (A–H, Table 1). This study was approved by the Institutional Review Board of the Jikei University School of Medicine (Study number: 27-277[8162]). All participants provided written informed consent to participate in this study. The results were presented following the COREQ guidelines for reporting qualitative studies [17] (Appendix 2).

Table 1. Attributes of participants

	Age	Sex	Setting	Medical specialty
A	50s	M	Private clinic	Cardiology
B	40s	M	Private clinic	Emergency medicine
C	30s	M	City general hospital	Rheumatology and connective tissue disease
D	30s	F	City general hospital	Internal medicine
E	30s	F	Private clinic	General medicine and primary care
F	40s	F	University hospital	General medicine and primary care
G	40s	M	City general hospital	Internal medicine
H	40s	F	Private clinic	Anesthesiology

Data collection

The participants received an explanation of how the interview would be recorded and conducted, and consented to be interviewed. The focus group interview was conducted with the guiding questions: 1) "What kind of changes do you have in your awareness and behavior after taking this program?"; and 2) "Do you notice any change in the behavior or attitude of staff at your workplace?"

The participants were interviewed in a quiet room undisturbed by daily activities, using a digital recorder. Three authors (MS, YF, and TJ), all primary care physicians, managed the interviews.

In this study, we considered it important to use and analyze the interactions generated by group discussions, and adopted the focus group interview method. Focus group interviews are also suitable for investigating attitudes and experiences [18, 19]. This method is reported to encourage people to talk about difficult content and voice critical opinions [18, 19]. Interviewers need to establish a positive rapport quickly during in-depth interviews [18]. In response to the interviewer's questions, participants verbalize their own experiences. That verbalization builds on the interactions and social constructions created between the interviewer and the participant [20]. Based on this constructivism recognition, we considered that the authors, who ran the program and facilitated the participants, should act as interviewers, rather than having a third party involved. We felt that this would better promote group dynamics and elicit discussions among the participants [20]. Therefore, the authors acted as interviewers for the focus group interviews. YF had the most experience with interviewing and was therefore the main interviewer, with MS and TJ assisting. These three authors had also managed the program and facilitated the participants' learning over the past 2 years.

The interview time was set at 60 minutes. When one participant responded to a question, several others typically added their opinions. YF asked all the participants questions using the guide questions in chronological order and encouraged participants with relatively few responses to provide additional opinions. In actuality, the interview took 72 minutes. At that point, the interviewer decided that theoretical saturation had been achieved without any further opinions from the participants.

Data analysis

We analyzed the interview records with the Steps for Coding and Theorization (SCAT) method, which is a grounded theory-based thematic analysis approach. SCAT is an analytical method that adds codes in a four-step process, from raw interview data to themes (Table 2) [21-23]. We used this method when conducting a previous study on the needs of participants for the program [10]. SCAT is suitable for the analysis of relatively small samples, such as those used in the previous study, and it was considered appropriate to use SCAT for this study with a similarly small sample [21, 23]. The SCAT method improves reflexivity by looking back at each step, and can be expected to improve the possibility of falsifiability by clarifying the analysis process [21-23]. Therefore, the SCAT method was selected as the analysis method of this study. Using the tape transcript, two authors (MS and TJ) independently coded the text for SCAT steps 1 to 3 [21, 23]. The two authors conferred on conflicting opinions about the content of the code until they reached a joint consensus. Three authors (MS, TJ, and HO) independently conducted the coding for SCAT step 4 [21, 23]. The three authors again conferred and agreed on common themes and constructs about the content of the code.

Table 2. Four steps following the SCAT (Steps for Coding and Theorization) method

	Analysis procedure	Examples
Step 0	Raw interview data	"I was able to learn systematically, not only biomedical issues but also psychosocial ones, by finding learning topics in scenarios, searching for literature, and considering it logically."
Step 1	Notable words in step 0	"learn systematically," "biomedical issues," "psychosocial ones," "searching for literature," "consider logically"
Step 2	Words that are not in the data to paraphrase step 1	Principles of family medicine, critical thinking
Step 3	Words to explain step 2	Experience of being able to apply evidence-based learning methods that were applicable to biological problems to psychosocial problems
Step 4	Themes and constructs that emerge from step 3	Changes in learning methods regarding medical practice

Patient and public involvement

There was no patient or public involvement in the design or implementation of this study.

RESULTS

Although our program took place over 2 years with nine participants enrolled, one participant dropped out after only 1 year because of changes in the participant's medical practice hours. Eight persons completed this program, and all agreed to participate in the interview. The participants' interview records were organized into three categories: "changes in learning regarding medical practice," "encounters with diverse perspectives and values, and confidence gained from those encounters," and "showing one's attitude towards learning and its influence on others" (Table 3). This section presents excerpts from focus group interviews on these categories.

Table 3. Themes and constructs about changes in behaviors

Themes and constructs	Phrases
I: Changes in learning regarding medical practice	I-i: Search for material and literature, I-ii: psychosocial problems
II: Encounters with diverse perspectives and values, and confidence gained from those encounters	II-i: Confidence, no judgment attitude for another's opinion, II-ii: tolerance of diversity, II-iii: no standard re-education program, II-iv: loneliness about own practice
III: Showing one's attitude towards learning and its influence on others	III-i: Active transformation of colleagues' learning motivation

I: Changes in learning regarding medical practice

This theme was subdivided into "search for material and literature (I-i)" and "psychosocial problems (I-ii)". The participants talked about how they moved from investigating biomedical problems in their daily practice to investigating problems involving biomedical and psychosocial factors.

I-i: Search for material and literature

As primary care physicians, the participants are solving clinical problems related to individual patient consultations. They had few opportunities to reflect on their practice, such as the evidence behind their treatment choices.

"I had never given much thought to my routine practice before, but the program made me dig deeper again into questions such as what guidelines said and what kind of literature there was." (B)

Secondary materials were often used to search for evidence to support daily practice and to resolve clinical problems. A change in participants' learning occurred in their search for primary materials and raw data, such as statistical data about their learning tasks.

"Now I search not only for secondary materials but also primary materials." (C, D)

Searching for primary materials was a shift in attitude toward generating opinions based on the participants' own ideas, to present their findings to other participants for discussion.

"All of us in the program gave presentations and had discussions based on statistics we looked up for ourselves." (G)

I-ii: Psychosocial problems

Participants were experienced in searching mainly secondary materials about biomedical problems. However, they had limited experience in searching material for information about psychosocial problems. Participants' learning attitude toward problem solving for various clinical problems changed.

"I was able to learn systematically, not only biomedical issues but also psychosocial ones, by finding learning topics in scenarios, searching for literature, and considering it logically." (A)

II: Encounters with diverse perspectives and values, and confidence gained from those encounters

This theme was subdivided into "confidence, non-judgmental attitude about other's opinions (II-i)", "tolerance of diversity (II-ii)", "no standard re-education program (II-iii)" and "loneliness about own practice (II-iv)". Participants who were inexperienced in primary care and operated in isolation at their workplaces described how they had changed after attending the program.

Ii-i: Confidence, non-judgmental attitude about other's opinions

When presenting their ideas to others, participants were concerned that they would be judged on whether they were correct or incorrect in their presentations. However, the non-judgmental atmosphere supported participants' learning.

"I felt like I would be judged for my presentation, but there was no critical atmosphere around presentations at all. It was an environment where I could research my learning topic freely and get feedback from everyone." (D)

II-ii: Tolerance of diversity

The non-judgmental attitude was based on an attitude of respecting individual values and tolerating diversity. These attitudes also encouraged participants to use primary materials and express their own ideas.

"I recognized that it's not really about whether someone is right or wrong, but that maybe there can be all kinds of physicians." (E)

II-iii: No standard re-education program

One of the reasons participants lacked confidence in their own thinking and were afraid of being judged was that they had not received standard retraining in primary care. They gained knowledge and

skills in primary care by attending the program, but also rediscovered the joy of learning through encounters with diverse values.

"I dove right into practicing family medicine without training in it. I had no confidence in myself, and I worried about what I should do and how I should study. The first thing that changed in me through participating in this program was meeting all kinds of physicians and encountering many ways of living. The program reminded me of the truth of how enjoyable it is to learn, even though my daily work as a physician is overwhelming, to think hard about my next own learning topic and compare it with what I actually see in my own patients." (H)

II-iv: Loneliness about own practice

Another reason for the lack of confidence and fear of judgment was the loneliness that participants felt in their daily practice. They were generally administrators in their own health care organizations and had no colleagues to talk to about various issues such as patient care, staff management and their own concerns. Encountering diverse values helped to alleviate this loneliness.

"In the clinic, in my position as the manager, even when I get lonely or worry about my relationships with my staff, I have no one to turn to for advice where my clinic is located. The only choice I ever had was to sort things out in my own head. However, by going to a place far away from my clinic and opening up to the people I met there, I learned that I'm not the only one who feels lonely." (H)

Participants felt less lonely, and dealing with diversity allowed them to open up. As a result, the participants realized the depth of their learning.

"I have the impression that the level of learning varies quite a bit depending on how much someone opens themself up." (C)

III: Showing one's attitude towards learning and its influence on others

This theme had only one subtheme, "active transformation of colleagues' learning motivation (III-i)". Participants saw their own learning change, gained confidence, and also shared their learning with their colleagues. Their own development led others to change too.

III-i: Active transformation of colleagues' learning motivation

Even without setting up a formalized learning session, showing a learning attitude is linked to the learning motivation of other colleagues.

"My staff told me that seeing me hard at work researching issues between examinations showed them that it's possible to learn even when you're busy. They said that when they saw how I studied, it made them want to work harder too." (H)

Showing colleagues the learning content increases their motivation to learn.

"I now make it a point to tell all of my staff everything I learned about in this program. I make sure to jot down what I learned and put it up in the meeting room." (A)

Based on the needs of the medical facility to which participants belong and the needs of their colleagues, the sharing of their learning content also led to changes in patient care.

"For instance, I have the staff at my clinic actually write out genograms based on what I learn from my patients. I think it's given my staff the ability to look at things from the perspective of the families and lifestyles of our patients." (A)

DISCUSSION

The first behavioral change that emerged in the participants' statements was a change in learning (Theme I). One participant stated that their literature searches and logical reasoning had changed regarding not only biological issues, but also psychosocial issues. Psychosocial problem-solving is a core competence in family medicine and primary care [24]. The participants in our program have a great deal of practical experience as specialists of different organs and are well-versed in literature searches and logical reasoning for biological issues. In addition to this capacity, our results suggested that completing our program may help participants acquire literature search and logical reasoning capacities for psychosocial issues.

The second behavioral change that emerged was related to encounters with diverse perspectives and values and the confidence gained from those encounters (Theme II). As previous studies have found, the absence of re-education programs often leads to learning in a solitary environment [6, 25]. In Japan, many private physicians engaged in primary care have solo practices [26]. By providing participants with an arena for learning, our program may have encouraged positive changes in the participants' attitudes. Providing an arena for learning and forming a learning community may be important, regardless of learning style. Further study is necessary to determine whether confidence, a specific change in the participants' attitudes, results from the PBL approach.

Participants spoke favorably about our program being held away from the locations where they practice. However, for physicians in rural areas, traveling to such programs is often considered an obstacle to participation [12]. Holding programs online facilitates participation from remote areas. In comparisons of online and on-site education, results are mixed [27]. One participant in the present study stated that it is difficult to consult with other medical professionals in her own community about issues encountered with patients. For learning about content highly relevant to the participants' practices, providing a learning community away from the areas where they practice may foster better learning. In relation to the CPD modalities, traditional face-to-face lectures are preferred by many

participants [28]. However, given the current COVID-19 pandemic, hosting the program online would reduce the risk of infection. Additionally, health care utilization in Japan has changed. Aoki et al. highlighted the need to strengthen primary care functions such as support for populations with social isolation and multimorbidity [29]. Further research should consider changing the program to an online format and modifying the primary care learning topics to be covered.

One participant in our study noted that discussions regarding the results of learning topics and participants' practices and values did not lead to a judgmental atmosphere. A positive atmosphere in classes and groups is considered to bring about cooperative learning, while positive discussions and a learner culture are thought to diversify learning, encourage flexible thinking, and increase creativity [30]. In East Asia, the learning style in medical education is based on Confucian culture [31]. The communication style is expressed as "cultural reticence" [32] – a tendency to not actively express what you know or feel [32]. Relevant to the comment that the level of learning may change depending on the degree to which someone opens themself up, the facilitator of learners' presentations and discussions may need skills to provide the learners with a safe discussion atmosphere in which the learners' presentations are not judged as right or wrong and which promotes self-disclosure. Currently, no formal training exists for such facilitators. Going forward, training to help facilitators promote discussion should be conducted while the program is administered.

The last behavioral change was the influence on others (Theme III). A present study suggests that program participants can promote a positive attitude towards learning in their workplace staff and others around them by demonstrating their own positive attitude towards learning and sharing what they have learned [33]. In East Asia, where Confucian influences are strong, students respect teachers, learn from them, and imitate their attitudes [31]. Such a cultural background may also improve the learning attitude of the workplace staff. Further examination of the effects of learning programs will require surveys of the participants' staff and confirmation of changes in patient care.

The Kirkpatrick model was used to evaluate this program [16]. This model is useful because of its clarity in focusing on program outcomes and its clear description of outcomes beyond simple learner satisfaction [16]. However, this model on its own does not provide educators with a complete evaluation of their educational programs [16, 34]. The model has been criticized on the grounds that it does not include intervening variables, such as motivation and learner's entry level, and the relationship between program elements and context [16, 35, 36]. In this interview, a participant commented on the importance of a non-judgmental atmosphere. It is necessary to investigate the intervening variables that have affected prior learning, and then conduct interviews with the intervening variables in mind regarding changes in behavior in the study group.

In terms of the three changes in attitude, we will consider whether attending this program was an effective learning exercise for the participants. The FAIR principles (Feedback, Activity, Individualization, and Relevance) are known to be associated with effective learning [37]. The points

of Activity and Individualization were achieved by the use of small groups and a learning strategy in which the learner selects the learning theme using the PBL approach. These points are evident from both the observed change in attitude toward the learning group shown in Theme II and the change in learning shown in Theme I as a result of the learning environment. In addition, the point of Relevance is also satisfied by using a scenario that assumes the site of primary care. This was evident from the fact that the program became a place to learn about problems faced in clinical practice, as described in Theme II. Under the conditions of a solo medical practice and learning environment, and with self-judgment of the correctness of learning tasks, appropriate feedback cannot be obtained from facilitators and other participants. The interview results on Theme II suggest that participating with confidence among participants with a diverse set of values in a non-judgmental environment provided sufficient feedback. Additionally, providing appropriate feedback is one of the competencies required as an educator [38]. Acting as a facilitator is one of the twelve roles of the educator, and feedback is included in this role. The third attitude change in Theme III applies to participants being viewed as role models. Studying in this program may also enhance participants' ability to support other learners as a faculty member. By observing how participants behave as facilitators or role models in clinical and learning settings, it may be possible to assess level 4 stages of the Kirkpatrick model for this program. This aspect could be a subject for future research.

The Kirkpatrick model was used to evaluate this program, but we aimed for an evaluation that went beyond the satisfaction of taking the course. For this reason, the evaluation was set at level 3 and 4 instead of 1 or 2. We evaluated one aspect of level 4 of the Kirkpatrick model measured through the impact the practitioner had on their colleagues. However, we did not evaluate another aspect of the impact on patient outcomes. As Samuel et al. state in their review, the outcomes corresponding to level 4 of the Kirkpatrick model from CPD programs are not supported by sufficient evidence [28]. Measuring outcomes in terms of patient health and medical economy may be a future research topic for the CPD program. This would require a survey of individual patients' illnesses and health conditions, as well as a survey of management conditions. The outcomes should also investigate what changes have occurred in the staff of the medical institutions to which the participants belong, using the participants as role models.

Limitations

The interview in the present study may not necessarily reflect all changes in the attitudes to learning among the program participants. It would also have been helpful to include the views of the participant who did not complete the program.

This study is an analysis of a single focus group interview with all participants who completed the program. Although the participants are experienced primary care physicians, they do not all have the same level of medical competence and knowledge on the themes of health problems

that are addressed in primary care. In addition, the level of their medical skills and knowledge was not verified beforehand. It is possible that changes in the learning attitude of each participant may have been overestimated or underestimated. Future research will require multiple focus groups with larger numbers of participants divided by their subspecialty.

The interview was conducted by facilitators who had been involved with the program for its 2-year duration. Close involvement in the learning process may have enabled the facilitators to encourage deeper discussion than an interviewer without such involvement. Conversely, the involvement of the interviewers in the learning process may have influenced the discussion about the effective outcomes of the program, as participants might not have wanted to offend the facilitators.

CONCLUSIONS

This study confirmed that participation in our 2-year CPD program changed participants' learning attitudes and education-related behavior. Our results suggest that support of CPD for primary care physicians requires the preparation of a learning community based on diverse values and perspectives, and the capacity for facilitation to foster the learning community.

ACKNOWLEDGMENTS

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STATEMENTS

Contributors

MS conceived the study, contributed to the development of its design, received the JSPS KAKENHI grant, collected the data, and analyzed the qualitative data. YF conceived the study, contributed to the development of the design, and interviewed the participants. MM conceived the study, contributed to the design, and facilitated the focus group interview. TJ facilitated the focus group interview and analyzed the qualitative data. HO analyzed the qualitative data and contributed to the design. YM, IO, and JH conceived the study and contributed to the design. All authors contributed to the drafting of the manuscript, and read and approved the final manuscript.

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Competing interests

MM received lecture fees and lecture travel fees from the Centre for Family Medicine Development of the Japanese Health and Welfare Co-operative Federation. MM is an adviser for the Centre for Family Medicine Development Practice-Based Research Network. The other authors report no conflicts of interest.

Patient consent for publication

Not required

Ethics approval

This study was approved by the Institutional Review Board of the Jikei University School of Medicine (Study number: 27-277[8162]).

Provenance and peer review

Not commissioned; externally peer reviewed.

Data availability statement

Because of the nature of this study, participants did not agree that their data could be shared publicly, so supporting data are not available.

APPENDIX 1

Primary care themes covered in the Family Medicine Brush-up Program

I. Typical health problems in primary care

Child – old age care	Palliative care	Women's health
Rehabilitation	Mental health problems	Vaccination
Chinese medicine	Common emergencies	Musculoskeletal problem
Surgery	Ophthalmology	Otorhinolaryngology

II. The principles of family medicine

Patient-centered clinical method	Family-oriented care	
Biopsychosocial model	Interprofessional work	
Prevention and health promotion	Ethics and law	Patient-clinician relationship
Healthcare context and continuity	Behavior modification	
Complexity and uncertainty	Reflective learning	

III. Interpersonal and communication skills

Medical interview	Laboratory tests in the clinic
Clinical problem solving	Evidence-based medicine
Professionalism	Minorities and socially vulnerable
Facility management	Practice guidelines

APPENDIX 2

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

No	Item	Guide questions/description	
Domain 1: Research team and reflexivity			
Personal Characteristics			
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group?	Yasuki Fujinuma conducted the focus group interview. Masayasu Seki and Tatsuhiro Joki assisted. Page 7.
2.	Credentials	What were the researchers' credentials? *E.g., PhD, MD*	Masayasu Seki, MD, PhD Yasuki Fujinuma, MD Masato Matsushima, MD, PhD, MPH Tatsuhiro Joki, MD, PhD Hideo Okonogi, MD, PhD Yasuhiko Miura, MD, PhD Jun Hiramoto, MD, PhD Iwao Ohno, MD, PhD. Page 1.

No	Item	Guide questions/description	
3.	Occupation	What was their occupation at the time of the study?	All researchers were primary care physician. Page 1.
4.	Gender	Was the researcher male or female?	All researchers were male. Page 1.
5.	Experience and training	What experience or training did the researcher have?	We conducted this research using the same analysis as for a previous study. Page 4.
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Participants were interviewed after taking the Family Medicine Brush-up Program for two years. Interviewers facilitated the program. Page 4, 5, 6.
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e.*g.*,	The participants received an explanation of the taped focus group interview process and gave their consent to participate. Page 5, 6, 7.

No	Item	Guide questions/description	
		personal goals, reasons for doing the research	
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g., *Bias, assumptions, reasons and interests in the research topic*	The main interviewer (Yasuki Fukunuma) was practicing primary care and was engaged in research and education activities in family medicine. Page 7.
Domain 2: study design			
Theoretical framework			
9.	Methodological orientation and theory	What methodological orientation was stated to underpin the study? *e.g., grounded theory, discourse analysis, ethnography,*	We analyzed the interview records with the Steps for Coding and Theorization (SCAT) method, which is a grounded theory-based thematic analysis approach. This method is suitable for the analysis of relatively small samples. The SCAT method improves reflexivity by looking back each

No	Item	Guide questions/description	
		phenomenology, content analysis	steps, and can be expected to improve the possibility of falsifiability by clarifying the analysis process. Page 7, 8.
Participant selection			
10.	Sampling	How were participants selected? *e.g., purposive, convenience, consecutive, snowball*	Participants were all those who had completed the two-year program. Page 5, 6.
11.	Method of approach	How were participants approached? e*.g., face-to-face, telephone, mail, email*	Face-to-face. Page 6, 7.
12.	Sample size	How many participants were in the study?	8 participants. Page 5, 6.
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	None. Page 5, 6.

No	Item	Guide questions/description	
Setting			
14.	Setting of data collection	Where was the data collected? e.*g., home, clinic, workplace*	The participants were interviewed in a quiet room undisturbed by daily activities. Page 7.
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	No. Page 6, 7.
16.	Description of sample	What are the important characteristics of the sample? *e.g., demographic data, date*	Eight participants completed the Family Medicine Brush-up Program targeting physicians who had not undertaken specialist training in family medicine and had qualified at least 10 years previously. Page 5, 6.
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	The interview was conducted using the guiding questions and was not pilot tested. Page 6, 7.

No	Item	Guide questions/description	
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	A single focus group interview was conducted. Page 5, 6.
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data?	The interview was audio-recorded using a digital recorder. Page 5, 6.
20.	Field notes	Were field notes made during and/or after the interview or focus group?	Yes. Page 6, 7.
21.	Duration	What was the duration of the interviews or focus group?	72 minutes. Page 7.
22.	Data saturation	Was data saturation discussed?	Saturation was defined as the point with no new comments from the participants. Page 7.
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No. Page 7.

No	Item	Guide questions/description	
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	Two. Page 7.
25.	Description of the coding tree	Did authors provide a description of the coding tree?	Yes (see results). Page 7, 8.
26.	Derivation of themes	Were themes identified in advance or derived from the data?	Themes were derived from the data. Page 7, 8.
27.	Software	What software, if applicable, was used to manage the data?	Not applicable. Page 7.
28.	Participant checking	Did participants provide feedback on the findings?	No. Page 7.

No	Item	Guide questions/description	
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes/ findings? Was each quotation identified? e.*g.*, *participant number*	Yes, quotations are presented and identified. Page 8, 9.
30.	Data and findings consistent	Was there consistency between the data presented and the findings?	Yes. Page 8, 9, 10, 11.
31.	Clarity of major themes	Were major themes clearly presented in the findings?	Yes. Page 8, 9.
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Yes. Page 8, 9, 10, 11.

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No	Item	Guide questions/description	
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8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g., *Bias, assumptions, reasons and interests in the research topic*	The main interviewer (Yasuki Fukumuma) was practicing primary care and was engaged in research and education activities in family medicine. Page 7.
Domain 2: study design			
Theoretical framework			
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No	Item	Guide questions/description	
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22.	Data saturation	Was data saturation discussed?	Saturation was defined as the point with no new comments from the participants. Page 7.
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No. Page 7.

No	Item	Guide questions/description	
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	Two. Page 7.
25.	Description of the coding tree	Did authors provide a description of the coding tree?	Yes (see results). Page 7, 8.
26.	Derivation of themes	Were themes identified in advance or derived from the data?	Themes were derived from the data. Page 7, 8.
27.	Software	What software, if applicable, was used to manage the data?	Not applicable. Page 7.
28.	Participant checking	Did participants provide feedback on the findings?	No. Page 7.

No	Item	Guide questions/description	
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes/ findings? Was each quotation identified? e.*g.*, *participant number*	Yes, quotations are presented and identified. Page 8, 9.
30.	Data and findings consistent	Was there consistency between the data presented and the findings?	Yes. Page 8, 9, 10, 11.
31.	Clarity of major themes	Were major themes clearly presented in the findings?	Yes. Page 8, 9.
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Yes. Page 8, 9, 10, 11.

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Use of a 2-year continuing professional development program to change Japanese physicians' attitudes to learning primary care: a qualitative study

Masayasu Seki[1]*, Yasuki Fujinuma[2, 3], Masato Matsushima[4], Tatsuhiro Joki[1], Hideo Okonogi[5], Yasuhiko Miura[1], Iwao Ohno[1], Jun Hiramoto[1]

[1]Division of General Medicine, Department of Internal Medicine, The Jikei University School of Medicine, Tokyo, Japan

[2]Centre for Family Medicine Development, Japanese Health and Welfare Co-operative Federation, Tokyo, Japan

[3]Seikyo-ukima Clinic, Japanese Health and Welfare Co-operative Federation, Tokyo, Japan

[4]Division of Clinical Epidemiology, The Jikei University School of Medicine, Tokyo, Japan

[5]Division of Nephrology and Hypertension, Department of Internal Medicine, The Jikei University School of Medicine, Tokyo, Japan

*Corresponding author:

Masayasu Seki, MD, PhD

Lecturer

Division of General Medicine, Department of Internal Medicine, The Jikei University School of Medicine, 3-25-8 Nishi-shimbashi, Minato-ku, Tokyo 105-8461, Japan

Email: masayasu-seki@jikei.ac.jp

Tel.: +81-3-3433-1111

Fax.: +81-3-5400-1267

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ABSTRACT

Objective

To evaluate changes in the learning attitudes of primary care physicians.

Design

Qualitative study through one focus group interview with the program's participants. Analysis of the focus group content using the Steps for Coding and Theorization (SCAT) method.

Setting

Japan.

Participants

Eight primary care physicians who completed a 2-year continuing professional development (CPD) program using a problem-based learning (PBL) approach, focused on acquiring the skills needed to practice as primary care physicians in the community.

Results

Participants described positive changes in their attitudes and behaviors as a result of the training program. These changes were grouped into three main themes: "changes in learning methods regarding medical practice," "encounters with diverse perspectives and values, and confidence gained from those encounters," and "showing one's attitude towards learning and its influence on others." The experienced practitioners participating in this study reported that the program helped them apply their skills more broadly; for example, searching the literature for psychosocial aspects of practice and engaging more comfortably with diverse perspectives. They reported the positive impact of their learning on their co-workers.

Conclusion

A 2-year CPD program using PBL can influence primary care physicians' attitudes and learning-related behaviors. Further research is needed to determine which specific aspects of the program are the most effective and whether the changes in attitudes and behaviors described affect patient care.

KEYWORDS: primary care, learning attitudes, qualitative, continuing professional development (CPD), problem-based learning.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This study examined changes in learning attitudes (Kirkpatrick model level 3) among primary care physicians and the impact of the changes on other staff (Kirkpatrick level 4) following a 2-year CPD program.
- This study had a small sample size and was a single focus group interview conducted in 2018.
- It is unclear whether changes in learning attitudes among participants have led to improved quality of patient care.
- Bias may have occurred because of the fact that the program facilitator was the main interviewer.

INTRODUCTION

Medical education continues from undergraduate education to continuing professional development (CPD), with doctors working in various roles as practitioners, researchers, and teachers [1]. CPD responds not only to the development of the doctors' personal professional development, but also to the needs of patients, their families, and their community [2]. Family medicine and primary care are disciplines that provide long-term care centered on people of all ages and situations [3]. It is comprehensive, continuing from pre-natal care to palliative care [3]. No training program – regardless of its duration or content – can provide the postgraduate medical trainee with all competencies needed for primary care [3]. Primary care physicians need to commit to lifelong learning with a deliberate CPD plan to practice with an expert level of clinical skills [4].

General practitioners (GPs) in Japan may become family practitioners or hospitalists [5]. Approximately one-third of physicians in Japan are in charge of primary care at their own private clinic after 5–10 years of specialist practice training at university hospitals or city general hospitals [6]. Many physicians do not have public primary care training but independently undertake learning and training in this area. Unlike physicians in many other countries, they do not need to participate in a specific CPD program on primary care to maintain licensure [7]. The Japan Primary Care Association, established in 2010, is responsible for board certification of senior residents who complete their training program [5, 8]. The Japanese Medical Specialty Board (distinct from the Japan Primary Care Association) was newly established in 2017 to manage the certification of GPs in Japan [5]. Board-certified GPs were recognized as a new specialist category under a board certification senior resident training program that began in 2018 [8, 9]. Although an education program for senior residents is now in place, educational support for veteran primary care physicians, whose training was focused on specific organ systems, is inadequate. Therefore, we consider that the CPD of primary care physicians in Japan should be supported.

In April 2016, we started a 2-year Family Medicine Brush-up Program, which is an interactive CPD program for primary care physicians with a problem-based learning (PBL) approach. The program aimed to enable participants to discuss and learn about issues encountered in primary care by studying scenarios based on themes such as those found in Appendix 1 [10]. We conducted a qualitative study to clarify participants' training needs and inform the program content [10]. Three categories of participant statements were established: "no standard re-education program for primary care physicians to respond to changes in the clinical and practice setting," "problems with undergraduate and postgraduate medical education in primary care," and "content of primary care CPD" [10]. Through the program, we aimed to develop the ability to identify problems in the practice of medicine and to continue learning to solve them. Al-Azri et al. and Dowling et al. reported that a PBL approach can improve physicians' performance and patient care [11, 12]. The PBL approach allows learners to actively participate in group activities and helps learners develop into reflective

practitioners [13]. The field of primary care is fraught with complex problems and uncertainties that make it difficult to arrive at a single correct management pathway [14]. We believe that primary care physicians who grow through repeated reflection have a strong affinity with lifelong learning, and for this reason we have adopted the PBL approach for this program. The PBL approach we used encompassed working in groups to discuss relevant, real problems. After the 2-year program that started in 2016 was completed, we considered evaluating the program to see how the participants had changed. We felt that the completion of the 2-year program by a number of participants was a good milestone to study the impact of the program on participants' attitudes toward learning primary care.

The Kirkpatrick model is used to evaluate educational programs, including CPD programs such as our Family Medicine Brush-up Program [1, 15]. The model focuses on the outcomes of the program, not just learner satisfaction [16]. The Kirkpatrick model was proposed in the 1950s, and a modified model (The New World Kirkpatrick model) was introduced in the 2000s [15]. The model consists of four levels [1, 13]. Level 1 is reaction and satisfaction: Do learners respond favorably to the program? Level 2 is learning measures: Do learners acquire the intended knowledge? Level 3 is behavioral change: Do learners apply what they learned? Level 4 is results and impact: Do the expected outcomes occur? [1, 15, 16].

In this study, we aimed to examine the changes that our program participants experienced in their attitudes towards learning (corresponding to Kirkpatrick level 3) and the impact those changes had on other staff present in the workplace (corresponding to Kirkpatrick level 4). To elicit detailed insights from individual participants, we chose to conduct a qualitative study based on focus group interviews with the program participants to explore those two dimensions of change and understand how our program contributed to those changes.

METHODS

Study design and participants

On completion of the program (January 2018), we conducted a single focus group interview with program participants to investigate changes in behavior that had occurred during the program corresponding to Kirkpatrick level 3 and to investigate impacts on their immediate colleagues corresponding to Kirkpatrick level 4. Interviews are considered effective for assessing these changes in behavior and their impacts [1].

Eight participants completed the Family Medicine Brush-up Program targeting physicians who had not undertaken specialist training in family medicine and had qualified at least 10 years previously. The interview was conducted at the end of the program with the eight physicians (A–H, Table 1). This study was approved by the Institutional Review Board of the Jikei University School of Medicine (Study number: 27-277[8162]). All participants provided written informed consent to participate in this study. The results were presented following the COREQ guidelines for reporting

qualitative studies [17] (Appendix 2).

Table 1. Attributes of participants

	Age	Sex	Setting	Medical specialty
A	50s	M	Private clinic	Cardiology
B	40s	M	Private clinic	Emergency medicine
C	30s	M	City general hospital	Rheumatology and connective tissue disease
D	30s	F	City general hospital	Internal medicine
E	30s	F	Private clinic	General medicine and primary care
F	40s	F	University hospital	General medicine and primary care
G	40s	M	City general hospital	Internal medicine
H	40s	F	Private clinic	Anesthesiology

Data collection

The participants received an explanation of how the interview would be recorded and conducted, and consented to be interviewed. The focus group interview was conducted with the guiding questions: 1) "What kind of changes do you have in your awareness and behavior after taking this program?"; and 2) "Do you notice any change in the behavior or attitude of staff at your workplace?"

The participants were interviewed in a quiet room undisturbed by daily activities, using a digital recorder. Three authors (MS, YF, and TJ), all primary care physicians, managed the interviews. In this study, we considered it important to use and analyze the interactions generated by group discussions, and adopted the focus group interview method. Focus group interviews are also suitable for investigating attitudes and experiences [18, 19]. This method is reported to encourage people to talk about difficult content and voice critical opinions [18, 19]. Interviewers need to establish a positive

rapport quickly during in-depth interviews [18]. In response to the interviewer's questions, participants verbalize their own experiences. That verbalization builds on the interactions and social constructions created between the interviewer and the participant [20]. Based on this constructivism recognition, we considered that the authors, who ran the program and facilitated the participants, should act as interviewers, rather than having a third party involved. We felt that this would better promote group dynamics and elicit discussions among the participants [20]. Therefore, the authors acted as interviewers for the focus group interviews. YF had the most experience with interviewing and was therefore the main interviewer, with MS and TJ assisting. These three authors had also managed the program and facilitated the participants' learning over the past 2 years.

The interview time was set at 60 minutes. When one participant responded to a question, several others typically added their opinions. YF asked all the participants questions using the guide questions in chronological order and encouraged participants with relatively few responses to provide additional opinions. In actuality, the interview took 72 minutes. At that point, the interviewer decided that theoretical saturation had been achieved without any further opinions from the participants.

Data analysis

We analyzed the interview records with the Steps for Coding and Theorization (SCAT) method, which is a grounded theory-based thematic analysis approach. SCAT is an analytical method that adds codes in a four-step process, from raw interview data to themes (Table 2) [21-23]. We used this method when conducting a previous study on the needs of participants for the program [10]. SCAT is suitable for the analysis of relatively small samples, such as those used in the previous study, and it was considered appropriate to use SCAT for this study with a similarly small sample [21, 23]. The SCAT method improves reflexivity by looking back at each step, and can be expected to improve the possibility of falsifiability by clarifying the analysis process [21-23]. Therefore, the SCAT method was selected as the analysis method of this study. Using the tape transcript, two authors (MS and TJ) independently coded the text for SCAT steps 1 to 3 [21, 23]. The two authors conferred on conflicting opinions about the content of the code until they reached a joint consensus. Three authors (MS, TJ, and HO) independently conducted the coding for SCAT step 4 [21, 23]. The three authors again conferred and agreed on common themes and constructs about the content of the code.

Table 2. Four steps following the SCAT (Steps for Coding and Theorization) method

Analysis procedure	Examples

Step 0	Raw interview data	" I was able to learn systematically, not only biomedical issues but also psychosocial ones, by finding learning topics in scenarios, searching for literature, and considering it logically."
Step 1	Notable words in step 0	"learn systematically," "biomedical issues," "psychosocial ones," "searching for literature," "consider logically"
Step 2	Words that are not in the data to paraphrase step 1	Principles of family medicine, critical thinking
Step 3	Words to explain step 2	Experience of being able to apply evidence-based learning methods that were applicable to biological problems to psychosocial problems
Step 4	Themes and constructs that emerge from step 3	Changes in learning methods regarding medical practice

Patient and public involvement

There was no patient or public involvement in the design or implementation of this study.

RESULTS

Although our program took place over 2 years with nine participants enrolled, one participant dropped out after only 1 year because of changes in the participant's medical practice hours. Eight persons completed this program, and all agreed to participate in the interview. The participants' interview records were organized into three categories: "changes in learning regarding medical practice," "encounters with diverse perspectives and values, and confidence gained from those encounters," and "showing one's attitude towards learning and its influence on others" (Table 3). This section presents excerpts from focus group interviews on these categories.

Table 3. Themes and constructs about changes in behaviors

Themes and constructs	Phrases
I: Changes in learning regarding medical practice	I-i: Search for material and literature, I-ii: psychosocial problems
II: Encounters with diverse perspectives and values, and confidence gained from those encounters	II-i: Confidence, no judgment attitude for another's opinion, II-ii: tolerance of diversity, II-iii: no standard re-education program, II-iv: loneliness about own practice
III: Showing one's attitude towards learning and its influence on others	III-i: Active transformation of colleagues' learning motivation

I: Changes in learning regarding medical practice

This theme was subdivided into "search for material and literature (I-i)" and "psychosocial problems (I-ii)". The participants talked about how they moved from investigating biomedical problems in their daily practice to investigating problems involving biomedical and psychosocial factors.

I-i: Search for material and literature

As primary care physicians, the participants are solving clinical problems related to individual patient consultations. They had few opportunities to reflect on their practice, such as the evidence behind their treatment choices.

"I had never given much thought to my routine practice before, but the program made me dig deeper again into questions such as what guidelines said and what kind of literature there was." (B)

Secondary materials were often used to search for evidence to support daily practice and to resolve clinical problems. A change in participants' learning occurred in their search for primary materials and raw data, such as statistical data about their learning tasks.

"Now I search not only for secondary materials but also primary materials." (C, D)

Searching for primary materials was a shift in attitude toward generating opinions based on the participants' own ideas, to present their findings to other participants for discussion.

"All of us in the program gave presentations and had discussions based on statistics we looked up for

ourselves." (G)

I-ii: Psychosocial problems

Participants were experienced in searching mainly secondary materials about biomedical problems. However, they had limited experience in searching material for information about psychosocial problems. Participants' learning attitude toward problem solving for various clinical problems changed.

"I was able to learn systematically, not only biomedical issues but also psychosocial ones, by finding learning topics in scenarios, searching for literature, and considering it logically." (A)

II: Encounters with diverse perspectives and values, and confidence gained from those encounters

This theme was subdivided into "confidence, non-judgmental attitude about other's opinions (II-i)", "tolerance of diversity (II-ii)", "no standard re-education program (II-iii)" and "loneliness about own practice (II-iv)". Participants who were inexperienced in primary care and operated in isolation at their workplaces described how they had changed after attending the program.

Ii-i: Confidence, non-judgmental attitude about other's opinions

When presenting their ideas to others, participants were concerned that they would be judged on whether they were correct or incorrect in their presentations. However, the non-judgmental atmosphere supported participants' learning.

"I felt like I would be judged for my presentation, but there was no critical atmosphere around presentations at all. It was an environment where I could research my learning topic freely and get feedback from everyone." (D)

II-ii: Tolerance of diversity

The non-judgmental attitude was based on an attitude of respecting individual values and tolerating diversity. These attitudes also encouraged participants to use primary materials and express their own ideas.

"I recognized that it's not really about whether someone is right or wrong, but that maybe there can be all kinds of physicians." (E)

II-iii: No standard re-education program

One of the reasons participants lacked confidence in their own thinking and were afraid of being judged was that they had not received standard retraining in primary care. They gained knowledge and skills in primary care by attending the program, but also rediscovered the joy of learning through encounters with diverse values.

"I dove right into practicing family medicine without training in it. I had no confidence in myself, and I worried about what I should do and how I should study. The first thing that changed in me through participating in this program was meeting all kinds of physicians and encountering many ways of living. The program reminded me of the truth of how enjoyable it is to learn, even though my daily work as a physician is overwhelming, to think hard about my next own learning topic and compare it with what I actually see in my own patients." (H)

II-iv: Loneliness about own practice

Another reason for the lack of confidence and fear of judgment was the loneliness that participants felt in their daily practice. They were generally administrators in their own health care organizations and had no colleagues to talk to about various issues such as patient care, staff management and their own concerns. Encountering diverse values helped to alleviate this loneliness.

"In the clinic, in my position as the manager, even when I get lonely or worry about my relationships with my staff, I have no one to turn to for advice where my clinic is located. The only choice I ever had was to sort things out in my own head. However, by going to a place far away from my clinic and opening up to the people I met there, I learned that I'm not the only one who feels lonely." (H)

Participants felt less lonely, and dealing with diversity allowed them to open up. As a result, the participants realized the depth of their learning.

"I have the impression that the level of learning varies quite a bit depending on how much someone opens themself up." (C)

III: Showing one's attitude towards learning and its influence on others

This theme had only one subtheme, "active transformation of colleagues' learning motivation (III-i)". Participants saw their own learning change, gained confidence, and also shared their learning with their colleagues. Their own development led others to change too.

III-i: Active transformation of colleagues' learning motivation

Even without setting up a formalized learning session, showing a learning attitude is linked to the learning motivation of other colleagues.

"My staff told me that seeing me hard at work researching issues between examinations showed them that it's possible to learn even when you're busy. They said that when they saw how I studied, it made them want to work harder too." (H)

Showing colleagues the learning content increases their motivation to learn.

"I now make it a point to tell all of my staff everything I learned about in this program. I make sure to jot down what I learned and put it up in the meeting room." (A)

Based on the needs of the medical facility to which participants belong and the needs of their colleagues, the sharing of their learning content also led to changes in patient care.

"For instance, I have the staff at my clinic actually write out genograms based on what I learn from my patients. I think it's given my staff the ability to look at things from the perspective of the families and lifestyles of our patients." (A)

DISCUSSION

The first behavioral change that emerged in the participants' statements was a change in learning (Theme I). One participant stated that their literature searches and logical reasoning had changed regarding not only biological issues, but also psychosocial issues. Psychosocial problem-solving is a core competence in family medicine and primary care [24]. The participants in our program have a great deal of practical experience as specialists of different organs and are well-versed in literature searches and logical reasoning for biological issues. In addition to this capacity, our results suggested that completing our program may help participants acquire literature search and logical reasoning capacities for psychosocial issues.

The second behavioral change that emerged was related to encounters with diverse perspectives and values and the confidence gained from those encounters (Theme II). As previous studies have found, the absence of re-education programs often leads to learning in a solitary environment [6, 25]. In Japan, many private physicians engaged in primary care have solo practices [26]. By providing participants with an arena for learning, our program may have encouraged positive changes in the participants' attitudes. Providing an arena for learning and forming a learning community may be important, regardless of learning style. Further study is necessary to determine whether confidence, a specific change in the participants' attitudes, results from the PBL approach.

Similarly, participants also spoke favorably about the effect on diversity of our program being held away from the locations where they practice. However, for physicians in rural areas, traveling to such programs is often considered an obstacle to participation [12]. Holding programs online facilitates participation from remote areas. In comparisons of online and on-site education, results are mixed [27]. One participant in our study stated that it is difficult to consult with other medical professionals in her own community about issues encountered with patients. For learning about content highly relevant to the participants' practices, providing a learning community away from the areas where they practice may foster better learning. Previous studies have also shown that traditional face-to-face lectures are preferred by many CPD participants [28]. However, during the

current COVID-19 pandemic, hosting the program online would reduce the risk of infection. Additionally, health care utilization in Japan has changed. Aoki et al. highlighted the need to strengthen primary care functions such as support for populations with social isolation and multimorbidity [29]. Further research should consider changing the program to an online format and modifying the primary care learning topics to be covered.

Again on the exposure to diverse perspectives, one participant in our study also noted that discussions regarding the results of learning topics and participants' practices and values did not lead to a judgmental atmosphere. A positive atmosphere in classes and groups is considered to bring about cooperative learning, while positive discussions and a learner culture are thought to diversify learning, encourage flexible thinking, and increase creativity [30]. In East Asia, the learning style in medical education is based on Confucian culture [31]. The communication style is expressed as "cultural reticence" [32] – a tendency not to actively express what you know or feel [32]. The level of learning may change depending on the degree to which someone opens themselves up, and a facilitator of learners' presentations and discussions may therefore need skills to provide the learners with a safe discussion atmosphere in which the learners' presentations are not judged as right or wrong and which promotes self-disclosure. Currently, no formal training exists for such facilitators. Going forward, training to help facilitators promote discussion should be conducted while the program is administered.

The third and final behavioral change was the influence on others (Theme III). A previous study suggests that program participants can promote a positive attitude towards learning in their workplace staff and others around them by demonstrating their own positive attitude towards learning and sharing what they have learned [33]. In East Asia, where Confucian influences are strong, students respect teachers, learn from them, and imitate their attitudes [31]. Such a cultural background may also improve the learning attitude of the workplace staff. Further examination of the effects of learning programs will require surveys of the participants' staff and confirmation of changes in patient care.

The Kirkpatrick model was used to evaluate this program [16]. This model is useful because of its clarity in focusing on program outcomes and its clear description of outcomes beyond simple learner satisfaction [16]. However, this model on its own does not provide educators with a complete evaluation of their educational programs [16, 34]. The model has been criticized on the grounds that it does not include intervening variables, such as motivation and learner's entry level, and the relationship between program elements and context [16, 35, 36]. It is necessary to investigate the intervening variables that have affected prior learning, and then conduct interviews with the intervening variables in mind regarding changes in behavior in the study group.

In terms of the three changes in attitude, we will consider whether attending this program was an effective learning exercise for the participants. The FAIR principles (Feedback, Activity, Individualization, and Relevance) are known to be associated with effective learning [37]. The points of Activity and Individualization were achieved by the use of small groups and a learning strategy in

which the learner selects the learning theme using the PBL approach. These points are evident from both the observed change in attitude toward the learning group shown in Theme II and the change in learning shown in Theme I as a result of the learning environment. In addition, the point of Relevance is also satisfied by using a scenario that assumes the site of primary care. This was evident from the fact that the program became a place to learn about problems faced in clinical practice, as described in Theme II. Under the conditions of a solo medical practice and learning environment, and with self-judgment of the correctness of learning tasks, appropriate feedback cannot be obtained from facilitators and other participants. The interview results on Theme II suggest that participating with confidence among participants with a diverse set of values in a non-judgmental environment provided sufficient feedback. Additionally, providing appropriate feedback is one of the competencies required as an educator [38]. Acting as a facilitator is one of the twelve roles of the educator, and feedback is included in this role. The third attitude change in Theme III applies to participants being viewed as role models. Studying in this program may also enhance participants' ability to support other learners as a faculty member. By observing how participants behave as facilitators or role models in clinical and learning settings, it may be possible to assess level 4 stages of the Kirkpatrick model for this program. This aspect could be a subject for future research.

As we aimed for an evaluation that went beyond the satisfaction of taking the course, we chose to address the program evaluation using dimensions corresponding to Kirkpatrick's level 3 and 4. We evaluated one aspect of level 4 of the Kirkpatrick model measured through the impact the practitioner had on their colleagues. However, we did not evaluate another aspect of the impact on patient outcomes. As Samuel et al. state in their review, the outcomes corresponding to level 4 of the Kirkpatrick model from CPD programs are not supported by sufficient evidence [28]. Measuring outcomes in terms of patient health and medical economy may be a future research topic for the CPD program. This would require a survey of individual patients' illnesses and health conditions, as well as a survey of management conditions. The outcomes should also investigate what changes have occurred in the staff of the medical institutions to which the participants belong, using the participants as role models.

Limitations

The interview in the present study may not necessarily reflect all changes in the attitudes to learning among the program participants. It would also have been helpful to include the views of the participant who did not complete the program.

This study is an analysis of a single focus group interview with all participants who completed the program. Although the participants are experienced primary care physicians, they do not all have the same level of medical competence and knowledge on the themes of health problems that are addressed in primary care. In addition, the level of their medical skills and knowledge was not

verified beforehand. It is possible that changes in the learning attitude of each participant may have been overestimated or underestimated. Future research will require multiple focus groups with larger numbers of participants divided by their subspecialty.

The interview was conducted by facilitators who had been involved with the program for its 2-year duration. Close involvement in the learning process may have enabled the facilitators to encourage deeper discussion than an interviewer without such involvement. Conversely, the involvement of the interviewers in the learning process may have influenced the discussion about the effective outcomes of the program, as participants might not have wanted to offend the facilitators.

CONCLUSIONS

This study confirmed that participation in our 2-year CPD program changed participants' learning attitudes and education-related behavior. Our results suggest that support of CPD for primary care physicians requires the preparation of a learning community based on diverse values and perspectives, and the capacity for facilitation to foster the learning community.

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STATEMENTS

Contributors

MS conceived the study, contributed to the development of its design, received the JSPS KAKENHI grant, collected the data, and analyzed the qualitative data. YF conceived the study, contributed to the development of the design, and interviewed the participants. MM conceived the study, contributed to the design, and facilitated the focus group interview. TJ facilitated the focus group interview and analyzed the qualitative data. HO analyzed the qualitative data and contributed to the design. YM, IO, and JH conceived the study and contributed to the design. All authors contributed to the drafting of the manuscript, and read and approved the final manuscript.

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Competing interests

MM received lecture fees and lecture travel fees from the Centre for Family Medicine Development of the Japanese Health and Welfare Co-operative Federation. MM is an adviser for the Centre for Family Medicine Development Practice-Based Research Network. The other authors report no conflicts of interest.

Patient consent for publication

Not required

Ethics approval

This study was approved by the Institutional Review Board of the Jikei University School of Medicine (Study number: 27-277[8162]).

Provenance and peer review

Not commissioned; externally peer reviewed.

Data availability statement

Because of the nature of this study, participants did not agree that their data could be shared publicly, so supporting data are not available.

APPENDIX 1

Primary care themes covered in the Family Medicine Brush-up Program

I. Typical health problems in primary care

Child – old age care	Palliative care	Women's health
Rehabilitation	Mental health problems	Vaccination
Chinese medicine	Common emergencies	Musculoskeletal problem
Surgery	Ophthalmology	Otorhinolaryngology

II. The principles of family medicine

Patient-centered clinical method	Family-oriented care	
Biopsychosocial model	Interprofessional work	
Prevention and health promotion	Ethics and law	Patient-clinician relationship
Healthcare context and continuity	Behavior modification	
Complexity and uncertainty	Reflective learning	

III. Interpersonal and communication skills

Medical interview	Laboratory tests in the clinic
Clinical problem solving	Evidence-based medicine
Professionalism	Minorities and socially vulnerable
Facility management	Practice guidelines

APPENDIX 2

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

No	Item	Guide questions/description	
Domain 1: Research team and reflexivity			
Personal Characteristics			
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group?	Yasuki Fujinuma conducted the focus group interview. Masayasu Seki and Tatsuhiro Joki assisted. Page 7.
2.	Credentials	What were the researchers' credentials? *E.g., PhD, MD*	Masayasu Seki, MD, PhD Yasuki Fujinuma, MD Masato Matsushima, MD, PhD, MPH Tatsuhiro Joki, MD, PhD Hideo Okonogi, MD, PhD Yasuhiko Miura, MD, PhD Jun Hiramoto, MD, PhD Iwao Ohno, MD, PhD. Page 1.

No	Item	Guide questions/description	
3.	Occupation	What was their occupation at the time of the study?	All researchers were primary care physician. Page 1.
4.	Gender	Was the researcher male or female?	All researchers were male. Page 1.
5.	Experience and training	What experience or training did the researcher have?	We conducted this research using the same analysis as for a previous study. Page 4.
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Participants were interviewed after taking the Family Medicine Brush-up Program for two years. Interviewers facilitated the program. Page 4, 5, 6.
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e.*g.*,	The participants received an explanation of the taped focus group interview process and gave their consent to participate. Page 5, 6, 7.

No	Item	Guide questions/description	
		personal goals, reasons for doing the research	
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g., *Bias, assumptions, reasons and interests in the research topic*	The main interviewer (Yasuki Fukunuma) was practicing primary care and was engaged in research and education activities in family medicine. Page 7.
Domain 2: study design			
Theoretical framework			
9.	Methodological orientation and theory	What methodological orientation was stated to underpin the study? *e.g., grounded theory, discourse analysis, ethnography,*	We analyzed the interview records with the Steps for Coding and Theorization (SCAT) method, which is a grounded theory-based thematic analysis approach. This method is suitable for the analysis of relatively small samples. The SCAT method improves reflexivity by looking back each

No	Item	Guide questions/description	
		phenomenology, content analysis	steps, and can be expected to improve the possibility of falsifiability by clarifying the analysis process. Page 7, 8.
Participant selection			
10.	Sampling	How were participants selected? *e.g., purposive, convenience, consecutive, snowball*	Participants were all those who had completed the two-year program. Page 5, 6.
11.	Method of approach	How were participants approached? e*.g., face-to-face, telephone, mail, email*	Face-to-face. Page 6, 7.
12.	Sample size	How many participants were in the study?	8 participants. Page 5, 6.
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	None. Page 5, 6.

No	Item	Guide questions/description	
Setting			
14.	Setting of data collection	Where was the data collected? e.*g., home, clinic, workplace*	The participants were interviewed in a quiet room undisturbed by daily activities. Page 7.
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	No. Page 6, 7.
16.	Description of sample	What are the important characteristics of the sample? *e.g., demographic data, date*	Eight participants completed the Family Medicine Brush-up Program targeting physicians who had not undertaken specialist training in family medicine and had qualified at least 10 years previously. Page 5, 6.
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	The interview was conducted using the guiding questions and was not pilot tested. Page 6, 7.

No	Item	Guide questions/description	
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	A single focus group interview was conducted. Page 5, 6.
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data?	The interview was audio-recorded using a digital recorder. Page 5, 6.
20.	Field notes	Were field notes made during and/or after the interview or focus group?	Yes. Page 6, 7.
21.	Duration	What was the duration of the interviews or focus group?	72 minutes. Page 7.
22.	Data saturation	Was data saturation discussed?	Saturation was defined as the point with no new comments from the participants. Page 7.
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No. Page 7.

No	Item	Guide questions/description	
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	Two. Page 7.
25.	Description of the coding tree	Did authors provide a description of the coding tree?	Yes (see results). Page 7, 8.
26.	Derivation of themes	Were themes identified in advance or derived from the data?	Themes were derived from the data. Page 7, 8.
27.	Software	What software, if applicable, was used to manage the data?	Not applicable. Page 7.
28.	Participant checking	Did participants provide feedback on the findings?	No. Page 7.

No	Item	Guide questions/description	
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes/ findings? Was each quotation identified? e.*g.*, *participant number*	Yes, quotations are presented and identified. Page 8, 9.
30.	Data and findings consistent	Was there consistency between the data presented and the findings?	Yes. Page 8, 9, 10, 11.
31.	Clarity of major themes	Were major themes clearly presented in the findings?	Yes. Page 8, 9.
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Yes. Page 8, 9, 10, 11.

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