Do Family Medicine Clerkships Complement Clerkships at Teaching Hospitals in Japanese Undergraduate Medical Education?: An Observational Study

Koki Nakamura[1]*, Satoshi Kanke[1], Goro Hoshi[2], Yoshihiro Toyoda[3], Kazutaka Yoshida[4], Toshiharu Kitamura[1], Ryuki Kassai[1]

ABSTRACT

Background: Despite recognition of the importance of primary health care, the opportunities for medical students to participate in family medicine clerkships (FMCs) are still inadequate around the world. In order for FMCs to be accepted in the undergraduate curriculum, it is necessary to clarify whether FMCs complement clerkships at teaching hospitals. Methods: Throughout the academic year 2018–2019, a total of 125 fifth-year students in Fukushima Medical University participated in an FMC. The students evaluated themselves at the beginning and end of their FMC whilst the family doctors evaluated students at the end of the FMC. The evaluations were a 5-point scale on 31 items in the following seven areas; objectives in general practice, practical skills and patient care, communication skills, patient-physician relationship, practice of team-based health care, medical practice in society and medical knowledge and problem-solving ability. A multiple regression analysis was conducted to assess whether self-evaluation was increased by clerkships at teaching hospitals where students rotated before the start of FMC. A Wilcoxon signed-rank sum test was used to assess self-evaluation changes before and after the FMC. Results: All 125 students completed the study. Pre-FMC self-evaluation scores for 19 items tended to be higher depending on when the FMC was conducted; the later the semester, the higher the score (e.g. diagnostic reasoning: first semester, 2.23; second semester, 2.48 [p = 0.11]; third semester, 2.61 [p = 0.02]). However, this tendency was not observed in the remaining 12 items: psychological and social background, home medical care, interprofessional work, healthcare system, team-based health care, participate as a member of the team, role of the physician in team collaboration, current medical situation in the community, community-based integrated care system, necessity of primary care, discover necessary tasks, and rank the tasks. In post-FMC evaluation, six of the 12 items were higher than four point in both the self-evaluations and family doctor evaluations. A significant increase was observed between the pre-and post-FMC self-evaluation scores in all 31 items (e.g. diagnostic reasoning: pre 2.2 and post 3.9 [p <0.0001]). Conclusion: The results of the present study suggest that FMCs complement clerkships at teaching hospitals.

Keywords: Family physicians, general practitioners, family practice, clinical clerkships, the model core curriculum

[1] Department of Community and Family Medicine, Fukushima Medical University,
  1 Hikarigaoka, Fukushima, 960-1295, Japan
[2] Hoshi Yokozuka Clinic, 20-36 2-chome Yokozuka, Koriyama, 963-8803, Japan
[3] Kitakata Centre for Community and Family Medicine, 4212 Rokumaiosa, Kitakata, 966-0083, Japan
[4] Hobara Central Clinic, 73-1 Shironouchi Hobara-machi, Date, 960-0611, Japan

Corresponding Author
Koki Nakamura: Department of Community and Family Medicine, Fukushima Medical University
Email: michell@fmu.ac.jp

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Background

In 2008, the World Health Organization encouraged all countries to direct their health care systems to strengthen primary health care (PHC)[1]. In 2018, the Astana Declaration stated that PHC should be provided by health professionals who are well-trained, skilled, motivated and committed[2]. Supporting strong and sustainable PHC requires family doctors who specialize in PHC to be deeply involved in medical school curriculums[3]. On the other hand, medical schools across the globe are in the process of curriculum reform in accordance with the global standards of the World Federation for Medical Education[4]. According to their Japanese version, family medicine is specified as one of the "important medical departments", which means it is requisite study for all medical students[5]. Despite recognition of the importance of PHC, the opportunities for medical students to participate in family medicine clerkships (FMCs) are still inadequate around the world. It was reported that 50 out of 259 universities (19%) had no or very brief FMCs, even in Europe where family medicine has advanced[6]. There is a similar issue in Japan, where PHC is only a newly recognized specialty[7]. In Japan, there are still few universities that have family medicine departments, and many medical students graduate without having studied family medicine[8]. However, in 2006, Fukushima Medical University founded the Department of Community and Family Medicine, which has provided FMCs since its founding. In the academic year 2018–2019, the duration of the FMC was 5 days (mandatory) for fifth-year students, and 10 days (elective) for sixth year students.

Two systematic reviews on the impact of FMCs on undergraduate medical education were reported in 2015[9, 10].However, there has been a lack of evidence as to whether or not FMCs complement clerkships at teaching hospitals[11, 12, 13]. In order for FMCs to be accepted in the undergraduate curriculum, it is necessary to clarify whether FMCs complement clerkships at teaching hospitals.

Methods

We conducted observational studies using student self-evaluations and student evaluations by family doctors in general practice clinics.

Participants and Setting
Throughout the academic year 2018–2019, the clinical clerkships were 50 weeks both fifth and sixth years. The clinical clerkships except FMCs were conducted at teaching hospitals. The inclusion criterion was set as students in their fifth year of medical school (n = 125) in the academic year 2018–2019. Students who did not give consent for study participation were excluded. The students received an explanation of the study on the first day of their FMC, and were enrolled after providing informed consent. The settings were three general practice clinics (Hobara Central Clinic, Hoshi Yokozuka Clinic, and Kitakata Centre for Community and Family Medicine). One or two students were assigned to each clinic during the study period.

Data source
The students each evaluated themselves at the beginning and end of their FMC, whilst the supervising family doctors also evaluated students at the end of the FMC. The evaluations were on a 5-point scale (1, very bad; 2, bad; 3, normal; 4, good; 5, very good). The evaluation consisted of 31 items related to FMCs in the "achievement goals in clinical clerkships" section of the model core curriculum for medical education in Japan (Table 1)[14]. The 31 items covered seven areas; objectives in general practice, practical skills and patient care, communication skills, patient-physician relationship, practice of team-based health care, medical practice in society and medical knowledge and problem-solving ability[14]. The scores were used for analysis.

Table 1. Thirty-one evaluation items extracted from the model core curriculum for medical education in Japan

Objectives in General practice
1. Assemble or follow diagnostic reasoning that emphasizes medical history/physical examination (including cases without diagnosis).
2. Experience a comprehensive approach to health problems (such as interactions of multiple health problems).
3. Have a viewpoint of family and community and participate to the extent possible in medical practice with more consideration for psychological / social background.
4. Experience home medical care.
5. Experience interprofessional work and recognize its importance.
6. Refer to the health, medical, welfare and long-term care systems in the clinical settings.

Practical skills and patient care
7. Appropriately take history (chief complaint, history of present illness, past medical history, family history, social / job history, system review, etc.), build a good relationship with the patient, and carry out patient education as necessary.
8. Comprehensively and systematically perform physical examination in proper order and efficient manner. Recognize and record abnormal findings and suggest relevant differential diagnoses.
9. Deliver presentations regarding the patient's condition (symptoms, physical findings, laboratory findings, etc.), problem list, differential diagnoses, clinical course and points of treatment, and exchange opinions with healthcare team members.
10. Explain pathophysiology, clinical course and treatment of chronic diseases and pain. Depending on the settings and system to provide medical care, participate in chronic medical care as a team member.

Communication skills
11. Actively listen to the stories of patients and their families and empathize with them.
12. Explain communication methods and skills (verbally and non-verbally) and outline their influences on attitudes and behaviors.
13. Build good relationship through communication.

Patient-physician relationship
14. Sufficiently consider psychological and physical pain of patients and their families.
15. Explain to patients with descriptive words.
16. Grasp the psychological and social background of the patient and to extract and organize the problem points related to leading an independent lifestyle.
17. Explain that medical practice is based on contractual trust relationship between patient and physician.
18. Explain how to deal with patients' requests (consultation, changing physicians, or referral).
19. Consider patient's privacy.

Practice of team-based health care
20. Explain the significance of team-based health care.
21. Explain the composition of the medical team and the roles of each member (physician, dentist, pharmacist, nurse, and other health professionals), cooperation and responsibility system and participate as a member of the team.
22. Recognize the limit of your ability and ask other healthcare professionals for assistance if necessary.
23. Explain the role of the physician in team collaboration between health, medical care, welfare and long-term care.

Medical practice in society

24. Outline the current medical situation in the community (including remote islands / areas) and the uneven distribution of physicians (region, clinical department and clinical/nonclinical).
25. Understand the concept of the community-based integrated care system and explain necessity of collaboration (including public administration) among professionals in areas of healthcare (maternal and child health, school health, adult/elderly people's health, community health, mental health), medical care, welfare, and long-term care.
26. Understand the role of primary care physicians and the necessity of primary care as the foundation of regional medical care and acquire necessary skills for practice.

Medical knowledge and problem-solving ability

27. Discover necessary tasks personally.
28. Rank the tasks you need according to the importance and necessity.
29. Discover concrete methods for problem solving and solve them.
30. On solving problems discover better ways to solve problems in cooperation with other learners and faculty members.
31. Appropriately self-assess and develop specific strategies for improvement.

Statistical analysis

In order to assess whether self-evaluation was increased by clerkships at teaching hospitals where students rotated before the start of FMC, a multiple regression analysis was conducted with the pre-FMC self-evaluation as the response variable, and the timing (first to third semesters) as the explanatory variable. We considered gender and setting as adjustment factors. A Wilcoxon signed-rank sum test was used to compare pre- and post-FMC self-evaluation scores.

The level of significance used for the statistical tests was $p < 0.05$, and all analyses were performed using STATA 15 (StataCorp LLC, 4905 Lakeway Drive College Station, Texas 77845-4512, USA).

Results

All 125 students completed the study, and their baseline characteristics are shown in Table 2.

Table 2. Student baseline characteristics

	N	N (%) or Mean (SD)
Age (years)	121*	24 (1.9)
Gender	125	
Males		78 (62)
Females		47 (38)
Training site	125	
Hobara Central Clinic		43 (34)
Hoshi Yokozuka Clinic		39 (31)
Kitakata Centre for Community and Family Medicine		43 (34)
Semesters	125	
1 (April through July)		42 (34)
2 (September through December)		42 (34)
3 (January through April)		41 (33)
Actual learning days	124†	
5		107 (86)
4.5		5 (4)
4		12 (10)

* and † indicate that four and one participants had missing data, respectively.

The relationships between the pre-FMC self-evaluations and the timing of FMC are shown in Table 3. Pre-FMC self-evaluation scores for 19 items tended to be higher depending on when the FMC was conducted; the later the semester, the higher the score. However, this tendency was not observed in the remaining 12 items: 3, psychological and social background; 4, home medical care; 5, interprofessional work; 6, healthcare system; 20, team-based health care; 21, participate as a member of the team; 23, role of the physician in team collaboration; 24, current medical situation in the community; 25, community-based integrated care system; 26, necessity of primary care; 27, discover necessary tasks; and 28, rank the tasks. Post-FMC evaluations and the self-evaluation changes are shown in Table 4. Six of the 12 items were higher than four point

in both the self-evaluations and family doctor evaluations (3, psychological and social background; 4, home medical care; 5, interprofessional work; 20, team-based health care; 27, discover necessary tasks; and 28, rank the tasks). A significant increase was observed between the pre-and post-FMC self-evaluation scores in all 31 items.

Discussion

In the current study, pre-FMC self-evaluation scores for 19 items tended to be higher depending on when the FMC was conducted; the later the semester, the higher the score. However, this tendency was not observed in the remaining 12 items. The result for 19 items seems to reflect that these items are well learnt in a hospital environment. In a previous study, students who rotated FMC in the last

Table 3. Relationship between pre-FMC self-evaluations and the timing of FMCs

Items	Semesters	Cons	β*	p value
1. Diagnostic reasoning	1	2.23	N.A.	N.A.
	2	N.A.	0.25	0.11
	3	N.A.	0.38	0.02
2. Comprehensive approach	1	2.02	N.A.	N.A.
	2	N.A.	0.16	0.92
	3	N.A.	0.35	0.04
3. Psychological and social background	1	2.35	N.A.	N.A.
	2	N.A.	-0.16	0.39
	3	N.A.	-0.05	0.8
4. Home medical care	1	1.88	N.A.	N.A.
	2	N.A.	-0.12	0.53
	3	N.A.	-0.07	0.7
5. Interprofessional work	1	2.8	N.A.	N.A.
	2	N.A.	0.1	0.56
	3	N.A.	0.06	0.72
6. Healthcare system	1	2.31	N.A.	N.A.
	2	N.A.	-0.03	0.84
	3	N.A.	-0.1	0.57
7. Take history	1	2.36	N.A.	N.A.
	2	N.A.	-0.01	0.93
	3	N.A.	0.46	0.01
8. Physical examination	1	1.99	N.A.	N.A.
	2	N.A.	0.23	0.13
	3	N.A.	0.42	0.01
9. Presentation	1	2.06	N.A.	N.A.
	2	N.A.	0.14	0.44
	3	N.A.	0.43	0.02
10. Chronic medical care	1	1.87	N.A.	N.A.
	2	N.A.	0.12	0.4
	3	N.A.	0.45	0.002
11. Actively listen	1	2.89	N.A.	N.A.
	2	N.A.	0.23	0.13
	3	N.A.	0.35	0.02
12. Communication methods and skills	1	2.62	N.A.	N.A.
	2	N.A.	-0.02	0.92
	3	N.A.	0.36	0.06
13. Build good relationship	1	3.07	N.A.	N.A.
	2	N.A.	-0.07	0.68
	3	N.A.	0.32	0.07
14. Psychological and physical pain	1	2.73	N.A.	N.A.
	2	N.A.	0.17	0.31
	3	N.A.	0.4	0.02
15. Explain to patient	1	2.78	N.A.	N.A.
	2	N.A.	0.05	0.77
	3	N.A.	0.33	0.05
16. Extract and organize the problem points	1	2.33	N.A.	N.A.
	2	N.A.	-0.02	0.91
	3	N.A.	0.32	0.06
17. Trust relationship	1	2.63	N.A.	N.A.
	2	N.A.	0.07	0.73
	3	N.A.	0.34	0.09
18. Patients' requests	1	2.07	N.A.	N.A.
	2	N.A.	0.07	0.69
	3	N.A.	0.32	0.06
19. Patient's privacy	1	3.1	N.A.	N.A.
	2	N.A.	0.37	0.05
	3	N.A.	0.6	0.002
20. Team-based health care	1	3.09	N.A.	N.A.
	2	N.A.	0.04	0.84
	3	N.A.	0.06	0.74
21. Participate as a member of the team	1	2.75	N.A.	N.A.
	2	N.A.	-0.26	0.13
	3	N.A.	0.03	0.87

Item		Mean	β	p value
22. Ask other healthcare professionals	1	2.93	N.A.	N.A.
	2	N.A.	0.07	0.7
	3	N.A.	0.29	0.15
23. Role of the physician in team collaboration	1	2.73	N.A.	N.A.
	2	N.A.	-0.15	0.31
	3	N.A.	0.06	0.69
24. Current medical situation in the community	1	2.57	N.A.	N.A.
	2	N.A.	-0.11	0.52
	3	N.A.	0.07	0.68
25. Community-based integrated care system	1	2.52	N.A.	N.A.
	2	N.A.	-0.14	0.44
	3	N.A.	-0.02	0.9
26. Necessity of primary care	1	2.36	N.A.	N.A.
	2	N.A.	0.04	0.78
	3	N.A.	0.16	0.31
27. Discover necessary tasks	1	2.97	N.A.	N.A.
	2	N.A.	-0.08	0.64
	3	N.A.	0.15	0.38
28. Rank the tasks	1	2.99	N.A.	N.A.
	2	N.A.	-0.08	0.66
	3	N.A.	0.13	0.46
29. Problem solving	1	2.91	N.A.	N.A.
	2	N.A.	-0.05	0.77
	3	N.A.	0.26	0.11
30. Discover better ways	1	3.08	N.A.	N.A.
	2	N.A.	0.04	0.84
	3	N.A.	0.22	0.2
31. Self-assess	1	2.89	N.A.	N.A.
	2	N.A.	-0.06	0.69
	3	N.A.	0.2	0.22

A multiple regression analysis was conducted with the pre-clerkship self-evaluation as the response variable and the timing (1–3 semesters) as the explanatory variable. We considered gender and setting as adjustment factors.

*β   : Partial regression coefficient
N.A.   : not available

Table 4. Post-FMC evaluations and self-evaluation changes

Items	Pre Self			Post Self				Post Doctor		
	N*	Mean†	SD	N*	Mean†	SD	p value	N*	Mean†	SD
1. Diagnostic reasoning	125	2.2	0.72	124	3.9	0.68	p < 0.0001	125	3.9	0.62
2. Comprehensive approach	125	2	0.78	124	4.1	0.7	p < 0.0001	125	4.1	0.73
3. Psychological and social background	125	2.1	0.88	124	4.2	0.74	p < 0.0001	125	4.2	0.73
4. Home medical care	125	1.5	0.88	124	4.7	0.47	p < 0.0001	125	4.5	0.75
5. Interprofessional work	125	2.4	0.79	123	4.4	0.65	p < 0.0001	125	4.1	0.70
6. Healthcare system	125	2	0.78	123	4	0.76	p < 0.0001	124	3.6	0.82
7. Take history	125	2.3	0.83	124	3.7	0.74	p < 0.0001	125	3.8	0.61
8. Physical examination	125	2	0.71	124	3.3	0.83	p < 0.0001	125	3.6	0.70
9. Presentation	125	2	0.87	124	3.5	0.91	p < 0.0001	125	4.0	0.81
10. Chronic medical care	125	1.8	0.69	124	3.3	0.87	p < 0.0001	125	3.9	0.78
11. Actively listen	124	2.9	0.7	124	4.4	0.58	p < 0.0001	125	4.2	0.76
12. Communication methods and skills	125	2.4	0.86	123	3.9	0.86	p < 0.0001	125	4.2	0.72
13. Build good relationship	125	2.8	0.81	124	4.1	0.7	p < 0.0001	125	4.3	0.71
14. Psychological and physical pain	125	2.8	0.79	124	4	0.61	p < 0.0001	125	4.2	0.65
15. Explain to patient	125	2.7	0.78	124	4	0.64	p < 0.0001	125	4.0	0.63
16. Extract and organize the problem points	124	2.3	0.78	124	3.7	0.66	p < 0.0001	125	4.1	0.61
17. Trust relationship	125	2.6	0.89	124	4	0.77	p < 0.0001	125	4.1	0.68
18. Patients' requests	125	1.9	0.79	124	3.4	0.85	p < 0.0001	125	3.7	0.77
19. Patient's privacy	125	3.4	0.89	124	4.3	0.68	p < 0.0001	125	4.3	0.63
20. Team-based health care	125	2.9	0.85	122	4.1	0.7	p < 0.0001	125	4.0	0.76
21. Participate as a member of the team	125	2.4	0.8	124	3.8	0.76	p < 0.0001	125	4.1	0.75
22. Ask other healthcare professionals	125	2.9	0.91	124	4.2	0.77	p < 0.0001	125	4.1	0.70
23. Role of the physician in team collaboration	124	2.5	0.67	124	3.9	0.81	p < 0.0001	125	3.9	0.74

24. Current medical situation in the community	125	2.4	0.81	124	3.5	0.8	$p < 0.0001$	125	3.8	0.87
25. Community-based integrated care system	125	2.2	0.8	124	3.9	0.82	$p < 0.0001$	125	3.8	0.81
26. Necessity of primary care	125	2.2	0.72	124	3.9	0.8	$p < 0.0001$	125	4.2	0.65
27. Discover necessary tasks	125	2.8	0.82	123	4.1	0.65	$p < 0.0001$	125	4.2	0.69
28. Rank the tasks	125	2.8	0.87	124	4	0.67	$p < 0.0001$	125	4.1	0.66
29. Problem solving	125	2.6	0.75	123	3.8	0.7	$p < 0.0001$	125	4.2	0.70
30. Discover better ways	125	2.9	0.81	124	4.1	0.69	$p < 0.0001$	125	4.4	0.62
31. Self-assess	125	2.7	0.75	124	3.9	0.7	$p < 0.0001$	125	4.2	0.71

* Due to missing data, the number is less than 125.
†on a 5-point scale (1, very bad; 2, bad; 3, normal; 4, good; 5, very good)

semester had the highest pre-FMC self-evaluation scores in items such as history taking, physical examination and differential diagnosis[11]. In the current study, the result for 12 items may reflect the weakness of clerkships at teaching hospitals. Of the 12 items, the following four are not currently included in the clerkships at teaching hospitals: 4, home medical care; 24, current medical situation in the community; 25, community-based integrated care system; and 26, necessity of primary care. It is noteworthy that the remaining eight items may be a weakness of clerkships at teaching hospitals: 3, psychological and social background; 5, interprofessional work; 6, healthcare system; 20, team-based health care; 21, participate as a member of the team; 23, role of the physician in team collaboration; 27, discover necessary tasks; and 28, rank the tasks.

In the post-FMC evaluations, six of the 12 items were higher than four point in both the self-evaluations and family doctor evaluations. In the self-evaluation changes, a significant increase was observed between the pre-and post-FMC self-evaluation scores in all 31 items. A randomized crossover trial reported that students can acquire clinical skills in the general practice setting to the same level as those in hospitals[15]. As benefits of FMCs, another previous study reported exploration of the psychological impact of illness and the social and environmental factors which determine health, learning skills from multidisciplinary teams of professionals such as nurses and pharmacists, and more feedback on history taking and physical examinations than is provided in hospitals[10]. Therefore, the results of the present study suggest that FMCs complement clerkships at teaching hospitals.

The current study has some limitations that should be addressed. First, it was performed in a single institution. Thus, the results cannot be generalized. However, it is noteworthy that the data were obtained from three different general practices located in urban and rural areas. Second, because self-evaluations were performed, there may be some self-reporting bias. At orientation on the first day of the FMC, we fully explained to the students that the current study would not affect their grades; however, there may be a possibility that the students purposefully exaggerated their post-FMC self-evaluations out of gratitude and consideration for the family doctors. Third, the exposure to family medicine was only for 5 days, and had no lasting impact. Fourth, a study with comparable subjects is needed to clarify whether skills and knowledge are better learnt in a family medicine situation rather than a hospital situation.

Conclusion

The results of the present study suggest that FMCs complement clerkships at teaching hospitals. As the movement toward implementation of FMCs in undergraduate curriculums has been accelerated worldwide, our results are important when considering the role of FMCs in undergraduate medical education.

Declarations

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