Legitimate peripheral participation in a research education program for primary care residents: a case study of educational research

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**Abstract**

**Background and Objectives:** The scholarly activity of primary care residents is important, but effectively teaching skills remains challenging. In Japan, few primary care residency programs provide a systematic research education program. The application of legitimate peripheral participation theory to research projects may enhance research education for residents. This pilot case study described the process of enrolling primary care residents in Japan in a research education program based on legitimate peripheral participation theory.

**Methods:** In this case study, 4 faculty members of the University of Tsukuba primary care residency program conducted an educational research program from April 2017 to June 2018 that incorporated legitimate peripheral participation theory.

**Results:** Five residents participated in the project. In phase 1, faculty members determined the research theme and prepared the plan. In phase 2, target residents were invited to participate and began to gather background knowledge about the theme. Faculty members created a mailing list and shared the research plan with the members. In phase 3, the overall project schedule was presented and faculty members and residents shared the work of data collection and input. Faculty members demonstrated the process of data analysis to residents and discussed the results with them. In phase 4, each resident, with faculty support, prepared an abstract and presentation. Residents completed their presentations at an annual primary care conference.

**Conclusions:** Introduction of legitimate peripheral participation theory to a primary care resident research education program may have contributed to overcoming obstacles in research education.

**Keywords:** resident research; resident education; primary health care
Introduction

Scholarly activity is a fundamental component of family medicine residency training. In the United States, the Accreditation Council for Graduate Medical Education (ACGME) requires that family medicine residents participate in scholarly activities (ACGME, 2018). However, teaching research skills during residency can be challenging due to time constraints, funding limitations, different levels of resident interest, and a relative lack of experienced faculty mentors (Leahy et al., 2008).

In Japan, similar obstacles seem to hinder research education (Yokoyama et al., 2009). The Japan Primary Care Association (JPCA), which certifies primary care residency programs in Japan, mandated that residents submit a research report for JPCA accreditation as a family physician. Still, few primary care residency programs offer systematic research education.

The introduction of legitimate peripheral participation (LPP) theory may improve the effectiveness of resident research education. LPP theory describes how newcomers become experienced members and eventually old timers of a collaborative project (Lave and Wenger, 1991). Residents who peripherally participate in a research project may gain familiarity with the research process despite their limited time and research experience.

In this case study, we describe the process of enrolling primary care residents in Japan in a research education program based on LPP theory.

Methods

This was a case study of an educational research program that took place from April 2017 to June 2018.

The University of Tsukuba General Medicine and Primary Care residency program is a 4-year program in which 5 to 7 residents complete the program each year. All residents spend most of their time away from the university and are on rotations in community hospitals and clinics. Previously, most residents completed their research report individually, by conducting either a small questionnaire survey or a small case series analysis.

In April 2017, 4 faculty members in this residency program decided to conduct a research project to establish a research education system and to provide each resident with a research theme for their report. Faculty members based the project on LPP theory so that residents could peripherally participate in the project and learn more about research. We collected the records of meetings and rehearsal as study data. This study was approved by the University of Tsukuba medical ethics board (1278).

Results

Five residents in their final year of residency who had not yet planned their own research projects participated in the faculty-initiated project. The process of this project is outlined in Figure 1.

Figure 1: Phases of residents' legitimate peripheral participation in the project
Phase 1: Project planning

Faculty Members' Roles
- Set project goals
- Define research theme
- Select participating residents
- Prepare research plan and ethical board application

Phase 2: Recruitment

Faculty Members' Roles
- Create mailing list of members
- Share with residents the processes of research planning and preparation of the ethical board application

Residents' Roles
- Peripherally participate in the research preparation process
- Gather background knowledge on project by reading through related research articles

Phase 3: Participation in research process

Faculty Members' Roles
- Lecture on the overall research plan
- Share an overview of the project
- Conduct survey
- Confirm the data entry rules
- Demonstrate the data analysis

Residents' Roles
- Prepare data entry sheet and use it to input results
- Discuss analyzed results
- Decide on a presentation theme.

Phase 4: Results presentation

Faculty Members' Roles
- Supervise preparation of abstracts and presentation slides
- Recruit next year's residents
- Review the overall research project
- Comments on presentations

Residents' Roles
- Prepare and submit abstracts
- Give presentation about slides preparation
- Rehearse presentations
- Present research at a conference
In phase 1, faculty members defined the following research theme with the hope that it would be interesting to residents and relevant to family physicians: "exploration of factors related to interprofessional collaboration in clinics and small hospitals." Faculty members prepared the research plan and ethics board application.

In phase 2, faculty members invited five residents who were in their final year of residency but who had not yet planned their own research projects to participate in this program, then created a mailing list of participating faculty members and residents and shared details on research plan preparation. With faculty guidance, residents gathered background knowledge about the research theme by reading through related research articles.

In phase 3, 2 research meetings were held. In the first meeting, faculty members gave lectures on the research in general, shared an overview of the project, and confirmed the schedule. Residents participated by performing work such as preparing data entry sheets and inputting data; this work was assigned before the second meeting. In the second meeting, faculty members reviewed the data entry rules based on residents' data input experiences. Faculty members demonstrated the process of data analysis, and both faculty and residents discussed the results and decided which theme each resident would present at a conference.

In phase 4, each resident prepared an abstract for conference presentation under the supervision of an assigned faculty member. These faculty adjusted each resident's level of participation according to their readiness for research. Residents rehearsed their slide presentations before the entire group. Residents and faculty members gave comments on each presentation and suggested improvements. Residents refined their presentations with their assigned faculty member, and all but one resident, who was on maternity leave, presented their material at a conference. Next year's residents were invited to observe the rehearsal and the conference presentation.

**Discussion**

Here we describe the first trial of the novel application of LPP theory to research education during residency. The effectiveness of LPP theory has been demonstrated with PhD students in the fields of engineering and social science/humanities (Hasrati, 2005), and in legal practice settings (Kraemer, 2014). Kraemer reported that learning based on concrete activities mediated by experts in a community of practice led to awareness and academic empowerment (Kraemer, 2014).

The community of practice, the key component of LPP theory and the focus of faculty members in this study, consists of domain, community, and practice (Floding and Swier, 2011; Wenger-Trayner, 2015). Regarding domain, faculty members carefully selected a research theme that would be familiar to participating residents. The community consisted of residents who needed to complete a research project, along with their mentors in the same department, with each participant knowing each other to some extent. Synchronous (e.g., meetings) and asynchronous (e.g., mailing list) communication also functioned as a research community. As for the practice, the faculty members defined the overall project outline and the specific tasks involved and described them to the residents.

This project succeeded in overcoming some of the challenges previously identified in research education during residency, such as time constraints, varying degrees of resident interest, funding limitations, and few experienced faculty mentors (Leahy et al., 2008). In this project, residents could control the extent of their participation according to their available time. Faculty defined an overall research theme that was relatively familiar to residents, and residents then selected their specific presentation theme according to their interest. Limited funding and faculty resources were overcome through the collaboration of faculty and residents in a team-based project.
It is highly significant that the details of the research education project could be described in this pilot case study. This case study may be helpful for residency programs with similar challenges.

This study is limited in that it involved a case report of a 1-year, single-facility project. No matter how detailed the description of the research project is, faculty members cannot control the commitment level of the participants, and the burden on faculty members cannot be ignored. In the future we should describe the efforts of residents and faculty members to ensure the continuity of the project. In addition, we should evaluate the outcome of the research education program according to residents' interest in research, choice of academic carrier, number of publications, and acquisition of research funding. We look forward to evaluating and refining the project over the long term.

Conclusions

Research education projects based on LPP theory may effectively overcome some of the difficulties faced by primary care residents when participating in scholarly activities during residency.

Take Home Messages

- Application of legitimate peripheral participation theory to a research project may overcome some difficulties facing research education during residency.
- The community of practice, a key component of legitimate peripheral participation theory, should be considered in order to ensure effective application of the theory to a research education project.

Notes On Contributors

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**Appendices**

None.

**Declarations**

The author has declared that there are no conflicts of interest.

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**Ethics Statement**

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