

Academic start-up support using tele-education improved self-esteem of a rural general physician

Abstract

One of the key factors for rural physicians to continue their rural practices is continuing professional development (CPD). In Japan, academic activities have been reported to be a common type of CPD. The use of tele-education in academic activities has many advantages, although it has recently not been available in rural regions because of insufficient communication infrastructure. However, use of current freely available and information and communication technology (ICT) has allowed rural physicians to effectively connect with their supporters from afar. There are no reports at all that describe “academic start-up support” using tele-education for rural general physicians who have never engaged in any academic activities. We used mixed methods to investigate whether academic start-up support using tele-education to a rural general physician affected their CPD. We made three important findings. First, the rural physician as a learner could earn academic achievements. Second, his experience through the academic start-up based on his clinical practice, values, and philosophy as a rural physician could help him improve his self-esteem as a physician, and enhance his career. Third, this academic support based on his rural lifestyle and values could build good relationships with his community. We believe that using ICT to support rural physicians can improve their self-esteem, and promote CPD and the recruitment and retention of rural physicians in rural regions.

Keywords: continuing professional development, information and communication technology, academic support, social networking service, lifestyle, remote supporting system, academic activities, recruitment, retention

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Abbreviations: CPD, continuing professional development; ICT, information and communication technology; MB/S, megabytes per second; SNS, social networking service

Introduction

One of the factors for rural physicians to continue their rural practices is continuing professional development (CPD).¹ In Japan, academic training has been reported to be the most common type of CPD, followed in descending order by participation in academic meetings, academic activities including doctor of philosophy programs.² The use of tele-education (remote-support systems using information and communication technology (ICT) in medical education) has many advantages (e.g., travel costs and time),¹ and is rapidly developing. However, tele-education has not been available in many rural regions until recently because of insufficient communication infrastructure. In addition, no reports have described academic start-up support using tele-education “based on rural physicians’ values, ways of life and self-esteem”. We aimed to investigate the effects related to rural physicians’ self-esteem and CPD of first-time academic activities using tele-education by a general physician belonging to general medicine department of a university.

Materials and methods

Our academic remote-support system using tele-education was provided from September 2016. The learner was a rural general physician (HN) with 11 years of rural practice after his graduation. He solely, as a single physician, ran the only clinic on the western-most isolated island in Japan (population: 1,700), which had insufficient communication infrastructure (maximum Internet line speed:

download, 1.1 megabytes per second [MB/s]; upload, 0.9 MB/s). The instructor was a general physician (TK) working at the general medicine department of a university located approximately 2,400 km topographically from the island. Among freely available ICT, Zoom Video Communications (<https://zoom.us/>), software that allows users to share their personal computer screens at low line speeds, and Face book (<http://www.facebook.com/>), a social networking service (SNS), were used with only anonymous personal data. As evidence of the academic activities supported by this system, rural physician HN prepared his first 2, previously published^{3,4} English-language case reports. We evaluated the effects of this intervention using three types of analyses: qualitative analysis of semi-structured interview to the learner; quantitative analysis of the article-writing process and the number of consultations by method of communication; text-mining analysis (a method and system for dividing unconstrained collections of sentences into words and phrases using natural language analysis techniques and analyzing their occurrence frequency and correlation to extract useful information) of text data through SNS and e-mail for the consultations between the instructor and the learner.

Results and discussion

First, as qualitative analysis, the instructor conducted a semi-structured interview with the learner (Table 1) (Table 2). The following effects on the learner were identified:

- I. Improvement in his self-esteem as a physician
- II. Realization of the importance of a sincere attitude to confront the community and region
- III. The better relationships with other medical professionals

- IV. Clear improvement in cooperation with affiliated hospitals
- V. More requests for patients' admissions from affiliated hospitals
- VI. an increase in the learner's confidence for accepting training of medical students and residents; and
- VII. The possibility of setting a good example for his colleagues working under the same conditions.

Table 1 Semi-structured interview: Impacts on learner

Summarized comments	Comments from learner
Improve Self-Esteem as a Clinician	"I felt proud of myself in academic activities such as clinical sites." "I sincerely felt that my activities were adequately evaluated."
Improve Attitude of Life-Long Learning	"I noticed the importance of clinical work and research together." "I felt the depth of medical science."
Improve Activities in Community	"Academic activities will be an achievement of a clinician who is being part of a community."
Improve recognition of Academic Activities and Medical Issues	"I began to read articles more respectfully."
Realize the Effect of Remote Learning	"I was more interested in medical problems, medical economics, and medical ethics." "The empathic attitude of the leader is effective in remote learning."
Using ICT	"I was able to do academic activities without anxiety because I could contact the leader anytime."

Table 2 Semi-structured interview: Influence on the learner's relationship to his community

Summarized comments	Comments from learner
Improve Reliability of other Medical Facilities, Doctors, and Patients	"This leads to better communications with medical doctors." "It leads to better collaboration among medical facilities." "The patient was pleased that doctors cooperated for his health."
Good versatility for other clinicians	"This would be a good example for clinicians working in rural areas." "The more communication facilities and software evolve, the more academic activities will be conducted easily."
Increase interactions with medical staff, not only doctors	"It became easier for medical staff to interact with other medical facilities."

Second, as quantitative analysis, we counted the article-writing process and the number of each consultation by communication

method (Table 3) (Table 4). Two case reports had almost same counts. Finally, as quantitative and qualitative analyses, we conducted text-mining analysis on the natural language text data for the consultations via SNS and e-mail between the instructor and the learner (Figure 1). The most commonly used words in the consultations were "Confront", "region" and "sincere."

Table 3 The Number of Consultations by Case Report and Communication Tool

Number of consultations		
Communication tool	Case report no.1	Case report no.2
Total Consultation	78	106
SNS and email	65	102
Telephone	10	3
Web Conference	3	1

Table 4 The Article Writing Process and the Number of Consultations with the Instructor

Start date (Number of consultations)		
Process	Case report no.1	Case report no.2
Case Selection	2016.09.16 (8)	2016.10.12 (4)
Writing	2016.09.17 (37)	2016.10.12 (38)
Submission	2016.12.19 (3)	2017.01.27 (18)
Revision	No revision	2017.03.31 (7)
Accept	2017.01.12 (3)	2017.04.04 (2)
After Accepted	2017.01.13 (8)	2017.04.16 (10)
After Published	2017.01.16 (3)	2017.04.17 (8)
Duration of case selection and submission	95 days	108 days



Figure 1 Text-mining analysis of text data of the learner through SNS and e-mail for the consultations between the learner and the instructor.

Figure 1A(left) Three type of colors (word class) mean blue (noun), red (verb), and green (adjective). The size indicates how characteristic the word is in sentences. The words are displayed as larger size if they are distinctive, and as smaller size if they are likely to appear in any sentence tend to be displayed.

Figure 1B (right) A list of the words used in order of frequency.

Three findings are apparent from the results. First, the learners in a rural region who have never engaged in any academic activities have earned academic achievements with ICT. Training for academic activity often includes actual face-to-face meetings. In our study,

only internet-based meetings and communications were used. Unrestricted use of SNS and e-mail facilitated effective academic activities for the learner and the instructor, especially considering their distance and time considerations. Telephones were traditionally the useful communication tool for tele-education, but they require the instructor and the learner to be present at the same time. Therefore, SNS and e-mail have supplanted phone communications given their flexibility. In addition, freely available video communication software allows more data to be transmitted than by telephone, with distant users able to share their computer screens. ICT has thus diminished topographical restrictions and ameliorated time management, making certain academic activities possible even in rural regions. This is good news for rural physicians who face difficulty receiving face-to-face training.

Second, the learner's experience through the academic start-up based on his clinical practice, values, and philosophy as a rural physician could help him improve his self-esteem as a physician, and enhance his career, attitudes surrounding life-long learning, and improve recognition of academic activities. Several reports pertaining to the effectiveness of CPD with tele-education have indicated that rural physicians' needs are unique and varied.⁵ This has indicated that tele-education could be a robust support system for rural physicians and be instrumental in recruitment and retention. However, no reports have described remote-support system using tele-education with ICT based on the values of rural physicians' ways of living life. Third, this academic support based on rural life values could foster good relationships with the learner's community (Table 1) (Table 2). Figure 1 depicts an analysis of the learner's feelings about the region and its people. Even in academic activities, the learners frequently used words such as regions, connections, and communities rather than academic-related words. This suggests that the support system for academic activities may be better for the region, the people, and himself.

These findings showed that our ICT support system based on the values of rural physicians' way of life could help the learner to promote his own development through academic activities and to foster good relationships with the people and region around him. The system could be a good guide for his aspirations. We believe that the use of ICT to support rural physicians' way of life could improve their

self-esteem, and promote the CPD of physicians working in rural regions, and would contribute to the recruitment and retention of rural clinicians.

Conclusion

Our study indicates that a physician with no academic career who works in a rural region could earn academic achievements through tele-education using ICT. The provision of this support system based on the learner's value helped him improve his self-esteem as a rural physician, enhance his career, and build good relationships with the people around him. We hope to improve self-esteem of rural physicians, and promote the CPD, recruitment, and retention of rural physicians striving in rural regions.

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Conflict of interest

The authors declare no potential conflict of interest with respect to the research, authorship and/or this article.

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