

The Quantitative Effect of Community-Based Participatory Research on Building Teamwork among Medical and Long-Term Care Services in Rural Japan: The Tome Medical Project

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Receive date: Apr 05, 2018; Accepted date: Apr 13, 2018; Published date: Apr 16, 2018

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Abstract

Background: Comprehensive teamwork among medical experts, nursing-care experts and non-experts are essential in promoting medical and nursing care services in a community for the well-being of all residents. For accomplishment, inter-professional workshops have been conducted in various places throughout Japan. However, only a few studies have evaluated the effect of these activities, and most of them included only medical experts. Thus, we launched a community-based participatory research (CBPR), consisted of serial workshops in Tome City, a northeastern rural area in Japan. To our knowledge, this is the first study to quantitatively evaluate the effect of CBPR.

Methods: We held workshops including small lectures at a frequency of 1-2 times a month during six months. The participants discussed issues of medical or long-term care in Tome City. At baseline and the final workshops, we distributed to the participants questionnaires where they graded scores on the quality of cooperation among medical and nursing-care services in Tome. The summed scores were used as our main outcome. The higher scores mean better integration.

Results: The median (range) of the scores for overall participants were 101.0 (66.0) at baseline, and 89.0 (76.0) at the end, with no statistical difference observed ($p=0.50$). Similar results were observed when stratified by number of times attending to other workshops and medical or nursing-care profession.

Conclusion: No improvement in collaboration was observed after serial workshops in 6 months. Further discussions would be needed how we can promote better collaboration among professionals and citizens for the achievement of residents' well-being.

Keywords: Community-based participatory research; General medicine; Teamwork; Social determinants of health

Abbreviations: CBPR: Community-Based Participatory Research; ToMED: Tome Medical Project

Introduction

The importance of comprehensive teamwork is increasing in many aspects of health care services, such as in patient safety [1], medical education [2-4], acute medical care [5], and cost-effectiveness [6]. Besides, the principal of Patient-Centered Care in individual decision making tells us that shared decision making in a community is necessary [7,8]. Moreover, interactive actions and teamwork among medical and nursing services, and the communities for the well-being of older people has been more essential than ever, especially in a population ageing society [9] where care comprises complexity, and chronic disease or comorbidities increase [1,10,11]. To provide sufficient medical, nursing, and welfare service to those in need of support, it is essential for medical professionals, formal and informal care-givers, and families to collaborate with each other [12-15]. World Health Organization also encourages the active participation of older people to form age-friendly cities [16]. Up till now, many advanced

projects communities have been introduced in Japan [17]. However, these studies did not reveal evident effect due to seldom use of quantitative measurement. Therefore, limitations of external validation are notable in these studies owing to the fact that every different district has different demographics, resources of medical and care, or histories and cultures.

Herein, we consider that there are two issues when promoting teamwork in a community. First, little is known about what kind of approach would be effective to establish teamwork. Second, there are not many reports using quantitative evaluation to identify the effectiveness of that approach [15].

To deal with the first issue, we considered of the usage of community-based participatory research (CBPR). CBPR is described as to increase knowledge from health research and promote practice of public health [18], through active collaboration among community members, organizational officers, or experts on specific fields, and researchers [19]. For the second issue, we adapted a quantitative evaluation which scales the degree of collaboration between medical and nursing care experts.

Based on these concepts, we conducted a CBPR in Tome City, Miyagi, a northeastern prefecture in Japan, with the aim to investigate

its quantitative effect on interaction among medical and nursing care experts.

Methods

Tome medical (ToMED) project

This CBPR was named as Tome Medical (ToMED) Project. Starting from December 2016, we held a seminar 1-2 times a month comprised of lecture and group discussion. Each seminar focused on issues of medical or long-term care in Tome City, such as the adaptation of family physicians or general practitioners in the city medical service, social determinants of health, interfaith chaplain, and safety network against disasters in communities. Anyone including residents was welcomed to participate in the seminars. In every seminar, we spent 1 hour to provide participants with not only one-way lectures, but also opportunities to discuss the topics and share the opinions with each other. We conducted this project until June 2017, ending up with a total of nine seminars in six months.

Questionnaire measuring intensity of collaboration

At baseline (1st seminar in December, 2016,) and final seminar (9th seminar in June, 2017), we distributed to the participants questionnaires, "Measure to quantify the quality of communication and cooperation among medical, nursing, and welfare services in a region" scale points developed and validated by Abe et al. [20]. This scale includes 26 items forming 6 domains; identification of health and care workers by names and faces, recognition of their roles, capability of collecting from them information about the patients (clients), opportunities to held up meetings and discussions among several professionals, network of consulting freely when in trouble, knowledge about local resources. For example, they were asked, "Do you think you can ask freely for information about the same patient (or client) you are looking after with other facilities?" Answers for all questions were to be chosen from 5 categories, ranging from "I strongly do think so (5 points)" to "I totally don't think so (1 point)." All points were added to comprise a total score for each respondent, ranging from 26-130 points, with higher scores meaning stronger intensity of collaboration in the area. The validity and reliability of this scale had been shown previously [20]. Responses from medical experts (physicians, dentists, registered nurses, public health nurses, pharmacists, registered dietitians, therapists) and care experts (care workers, caseworkers, administrative officers, or other office workers)

were considered as valid. Responses from other occupations were excluded.

Statistical analyses

First, median (range) of the total scores were respectively driven from overall baseline and final seminar respondents. They were compared by using Mann-Whitney's U test.

Second, we compared the medians of total score for each seminar by stratification according to the number of times each respondent participated in other seminars held in the district besides ToMED Project, because participants who attended workshops more often would likely to increase the scores. Also, we stratified the analysis by their occupation, whether they were medical or nursing-care professionals, because we hypothesized that medical or nursing-care professionals might make different responses to the workshops. We used SPSS version 23 (IBM, Chicago, Illinois) for all analyses. All tests were two-tailed, and differences at $P < 0.05$ were considered statistically significant.

Ethics

The study protocol was reviewed and approved by the Ethics Committee of Tohoku University Graduate School of Dentistry. We considered each participant's response to the questionnaire as their consent to participate in the survey.

Results

The maximum number of participants for each workshop was set to 35. Thirty and 27 persons participated in the baseline and final workshop, respectively. Among those, the number of valid respondents were 15 (response rate=50.0%) and 16 (59.3%), respectively. Only a few participants attended both workshops and none participants responded to both questionnaires.

Table 1 shows the characteristics of each respondent. The percentages of those who lived in Tome City were 80.0% at baseline and 81.3% at the final workshop. Regarding the types of occupations, the percentage for medical and nursing-care experts were 53.3%, 46.7% at baseline, and 43.8%, 56.3% at the end. For the number of times participating in other seminars, more than a half attended more than 6 times in both workshops.

Variables	Baseline		Final	
	n	Percentage (%)	n	Percentage (%)
No of participants	30		27	
Respondents to questionnaire (Among respondents)	15	50.0%	16	59.3%
Women	N/A	-	11	68.8%
Age (Year)				
20-29 y	N/A	-	2	12.5%
30-39 y	N/A	-	5	31.3%
40-49 y	N/A	-	5	31.3%

50-59 y	N/A		3	18.8%
≥ 60 y	N/A	-	1	6.3%
Residents in Tome City	12	80.0%	13	81.3%
Number of times participated in other seminars				
≤ 5 times	6	40.0%	9	56.3%
≥ 6 times	9	60.0%	7	43.8%
Types of experts				
Medical	8	53.3%	7	43.8%
Nursing-care	7	46.7%	9	56.3%
N/A: not available				

Table 1: Characteristics of participants for each seminar.

Table 2 shows the total score for each workshop. Overall, the median (range) of total scores were 101.0 points (66.0 points) at baseline, and 89.0 points (76.0 points) at the end, with no statistical difference observed (p=0.50).

Variables	Baseline		Final		P value ¹
	median (range)		median (range)		
Overall	(n=15)		(n=16)		0.50
	101.0	66.0	89.0	76.0	
Number of times participated in other seminars					
≤ 5 times	(n=6)		(n=9)		0.96
	95.0	42.0	93.0	76.0	
≥ 6 times	(n=9)		(n=7)		0.35
	102.0	65.0	80.0	51.0	
Types of experts					
Medical	(n=8)		(n=7)		0.78
	86.5	65.0	80.0	72.0	
Nursing-care	(n=7)		(n=9)		0.41
	102.0	48.0	97.0	55.0	

¹Calculated by Mann-Whitney's U test

Table 2: Total score for intensity of collaboration.

Next, we compared the total scores with stratification according to the number of times the individuals attended in recent study seminars. For those who attended ≤ 5 times, the corresponding score lowered at the final workshop with no significant difference. The median of total scores were 95.0 points (42.0 points) at baseline (n=6), and 93.0 points (76.0 points) at the end (n=9). The insignificant reduction of total score was also seen among those who attended ≥ 6 times, with corresponding scores being 102.0 points (65.0 points) at baseline (n=9), and 80.0 points (51.0 points) at the end (n=7).

We also conducted stratified analysis according to the types of occupations. Among medical experts, the median of total scores were 86.5 points (65.0 points) at baseline (n=8), and 80.0 points (72.0 points) at the end (n=7). Regarding the nursing-care experts, corresponding scores were 102.0 points (48.0 points) at baseline (n=7), and 97.0 points (55.0 points) at the end (n=9) with no significant difference observed.

Discussion

Our study found moderate level of collaboration among medical and nursing-care professionals in Tome City. Contrary to our expectation, the collaboration level did not improve after serial workshops in 6 months. The finding was robust in the stratified analysis by times of attending in study seminars or occupations.

To our knowledge, we have two unique aspects in our study. First, compared with other studies, we used CBPR approach to promote collaboration among experts and non-experts with different roles. Second, we provided new evidence about the quantitative effect of CBPR on collaboration.

Despite these new attempts, we found no improvement in collaboration score. This result coincided with that of study conducted by Tsuchiya et al. which investigated the change in integration between physicians and other home care professionals through workshops [21]. On the contrary, Abe et al. still showed improvement in multidiscipline cooperation [22]. Here, we found five possible reasons for the lack of improvement in our study. First, corresponding to one of the limitations of this study, the participants in each workshop were not always the same. In other words, we could not identify any respondents who answered both questionnaires. Therefore, the total scores representing the degree of collaboration were not driven from same respondents, which meant that the score reduction from the baseline to the final workshop is not true. Second, participants may have overestimated their degree of collaboration in the beginning and have become to recognize their actual integration after being introduced in the lectures of many good practices taken place in other districts. Third, participants may have become to recognize that discussing topics in Tome was not just enough. That is, they might have recognized that they themselves had to set up shared sophisticated goals and act to benefit the community. For future study, we are

preparing advanced approaches aimed to create a working team whose members interact with each other and discuss important issues among the community [15] or the use of co-design for sustainable community health care [23]. Fourth, only six months of study period may have been insufficient for the participants to establish mature collaboration, compared to a 1-year study by Abe et al [22]. Lastly, our study focused on collaboration in a community, while Abe's study was within a hospital. Creating sufficient team in a community would take longer time than within a hospital.

Our study possessed limitation in that selection bias may have existed, due to the fact that those who participated in our project are highly conscious of collaborating with others in their works. However, the study by Abe et al used the same scale and showed similar moderate intensity [22]. Therefore, our results have a possibility of external validity.

Majority of municipalities throughout Japan are confronting aging-population, with the proportion of those aged ≥ 65 years predicted to rise to 30.3-43.8% by year 2040 within all 47 prefectures [24]. Accordingly, the number of elderly disabled or demented will also increase [25]. However, this is the context not only in Japan but throughout the world [26], especially in the Asian countries whose aging-rate is predicted in the next few decades to become as high as that of Japan at present. Thus, our report will likely be a valuable evidence for future world.

Conclusion

We conducted 6-month workshops in Tome City targeting experts and non-experts in medicine and nursing-care to find moderate but no improvement in collaboration score. However, to our knowledge, this study was the first to quantitatively evaluate the effect of CBPR on integration among care providers. Still, advanced approaches are needed in the future to enhance co-living for the achievement of residents' well-being in a community setting.

Acknowledgements

We are grateful to Dr. Yusuke Tanoue, director of Yamato Home Medical Clinic in Tome City, the staffs of the clinic, and all participants who participated in the ToMED Project. TT designed the research, KS and TT conducted the research and collected the data; KS analyzed the data and prepared the paper; KS and TT had primary responsibility for final content. Neither author had a conflict of interest related to the study.

Funding Sources

This research was supported by the Mitsubishi Foundation, Japan and Creative Interdisciplinary Research Program from Frontier Research Institute for Interdisciplinary Sciences of Tohoku University, Japan

Author Disclosures

Kemmyo Sugiyama and Toru Tsuboya have no conflict of interest to declare.

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Citation: Sugiyama K, Tsuboya T (2018) The Quantitative Effect of Community-Based Participatory Research on Building Teamwork among Medical and Long-Term Care Services in Rural Japan: The Tome Medical Project. *J Community Med Health Educ* 8: 605. doi: [10.4172/2161-0711.1000605](https://doi.org/10.4172/2161-0711.1000605)

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