J. Phys. Ther. Sci. 34: 445–453, 2022

The Journal of Physical Therapy Science

Original Article

Effect of education on physical and occupational therapists' perceptions of clinical practice guidelines and shared decision making: a randomized controlled trial

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Abstract. [Purpose] This study aimed to investigate the influence of the evidence practice gap on physiotherapist and occupational therapists through shared decision making using the clinical practice guidelines. [Participants and Methods] A randomized controlled trial was used. The participants included 126 therapists from three institutions. The inclusion criteria was permanent employment in these institutions. Participants' characteristics were masked from the allocator, evaluator, and analyzer. For the intervention group, a workshop on shared decision making was conducted using clinical practice guidelines. Two control groups were set. One group received a lecture on the knowledge of clinical practice guidelines, and the other group received a lecture on the knowledge of shared decision making. The primary outcomes were "education, attitudes and beliefs, and interest and perceived role in evidence-based practice" scale. [Results] The primary outcomes showed a significant difference between the clinical practice guidelines with shared decision making group and the clinical practice guidelines group (mean ± standard deviation, pre/post; clinical practice guidelines with shared decision making group, 2.4 ± 0.9/4.4 ± 1.7; clinical practice guidelines group, 3.0 ± 1.5/3.5 ± 2.0; shared decision making group, 2.6 ± 1.2/ 3.3 ± 1.8). [Conclusion] Shared decision making education using the clinical practice guidelines improves evidence-based practice of self-efficacy in physiotherapists and occupational therapists.

Key words: Evidence-based medicine, Communication skill, Rehabilitation

(This article was submitted Jan. 17, 2022, and was accepted Mar. 6, 2022)

INTRODUCTION

Evidence-based practice (EBP) in medical care integrates research evidence with clinical study, clinical expertise, and patient values[1)]. Self-efficacy, in terms of knowledge, skills, and attitudes, is important when providing EBP[2–4)]; therefore, there is need for EBP education among rehabilitation professionals[5, 6)].

Knowledge of clinical practice guidelines (CPGs) increases the self-efficacy of the practitioner in EBP[7–9)]. Studies have reported the relevance of CPG-related knowledge and attitudes as well as the importance of self-efficacy in EBP[10–12)]. A CPG is defined as "a document that presents appropriate recommendations to assist patients and practitioners in making deci-

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(Supplementary materials: refer to PMC https://www.ncbi.nlm.nih.gov/pmc/journals/2193/)

sions regarding clinical practice of high importance based on the body of evidence evaluated and integrated by systematic reviews and the balance between benefits and harms[13]". CPGs function as a tool to support the decision making of medical practitioners in clinical practice[14].

Shared decision making (SDM) is a fundamental communication skill required to conduct EBP[15–17]. Practicing SDM prevents perception gaps in clinical practice between patients and medical practitioners[18]. Additionally, it helps integrate the three elements of EBP, that is research evidence, clinical expertise, and patients' perspectives, which are crucial factors of decision making. Studies have shown that the educational effect of SDM increases self-efficacy in EBP, particularly when searching for information about practices and when considering patients' perspectives[19–23]. In the field of rehabilitation, communication regarding decision making for treatment is important because treatment options vary depending on the patient's background, such as the severity of their illness and their ability level regarding activities of daily living.

Though both CPGs and SDM are important in clinical practice, implementation of CPGs for patient communication is not systematic, particularly in the field of rehabilitation. We hypothesized that the simultaneous application of SDM and CPG would greatly increase the self-efficacy of EBPs.

Thus, this study aimed to investigate the influence of novel education methods—through the implementation of SDM using CPGs—on self-efficacy in EBP among physiotherapists and occupational therapists.

PARTICIPANTS AND METHODS

This study is registered with the University Hospital Medical Information Network Center (ID: UMIN000035448), and this report respects the Consolidated Standards of Reporting Trials (CONSORT)[24]. This study was conducted with the approval of the Ever Walk Inc. Research Ethics Committee (Authorization No. 002) and conformed to the Declaration of Helsinki.

The study design comprised a multicenter, parallel, randomized control trial. Participants included 126 therapists (physiotherapists and occupational therapists), with 42 continuous samplings from each of the three Japanese medical institutions (allocation ratio: 1:1) selected for the study. The participants were assigned to one of three groups. After receiving an explanation regarding the research content, the participants provided written consent to participate. To avoid measurement bias, the research hypothesis was not explained to the participants.

The following inclusion criteria were applied for participant selection: 1) being a permanent employee of one of the selected institutions; 2) being a full-time employee; and 3) willing to participate in the research. Those who suffered from disorders that may interfere with the research, such as visual, auditory, or attentional disorders, were excluded. The existence of such disorders was based on self-certification. Although there was no deviation from the protocol, changes were made to the designed randomization while conducting the research.

Although there was no deviation from the registered study protocol, changes were made to the method of randomization while conducting the study. As shown below, block randomization was adopted while considering the characteristic variation of the research institutions.

According to block randomization, random allocation was based on affiliation (three block sizes). After the principal investigator had completed the selection of the research participants, the sealed envelope system was used during registration to allocate participants into three groups. Forty-two participants from the three institutions were allocated into three groups, each having 14 participants. Patients were allocated in the order in which each registered for the study. The allocators who allocated the participants was assigned as an educator to conduct the educational program. The allocators were masked as to the participants' characteristics, except their affiliation, until allocation was completed.

The results of the allocation were known only by the educator teaching the program; the participants were informed which education program was allocated only after the study had been completed. After the study, the participants were permitted to join an educational program other than the one to which they had been assigned during the study, if they wished.

The outcome evaluator and the analyzer were masked as to the participants allocation as well. The analysis was undertaken by members who were not involved in allocation or in conducting the educational program. The results of the acquired outcomes were concealed from other research collaborators until the analysis was completed.

For the intervention group, a two-hour workshop was conducted, and lectures were given on SDM using CPGs (CPGs/SDM group). The control group was divided into two groups: one attended a two-hour lecture on knowledge of CPGs (CPG group), and the other attended a lecture on knowledge of SDM (SDM group).

The workshops conducted on SDM using CPGs were organized in three different ways. The participants in the first workshop worked in pairs. Their task was to verbally guide their masked partner to a destination without touching them. The workshop aimed to understand the difficulty of verbally explaining information and learn how this could be done effectively. The second workshop was designed to allow participants to practice explaining whether Fruit A or Fruit B was better for health. After the activity, they studied the elements of effectively explaining the benefits of fruits, in line with the nine steps of SDM[25], which constitute a technique whereby medical practitioners and patients cooperate in decision making (Table 1). The third workshop focused on improving the walking speed of a stroke patient by having the participants organize CPG information and evidence related to the patient based on the nine steps of SDM. The selected CPGs were specific to improving walking speed in stroke patients. The workshop was conducted with a group of 5–6 participants.

Table 1. The nine steps of SDM[25]

1. Disclosure that a decision needs to be made
2. Formulation of equality of partners
3. Equipoise statement
4. Informing on the options' benefits and risks
5. Investigation of patient's understanding and expectations
6. Identification of preferences
7. Negotiation
8. Shared decision
9. Arrangement of follow-up

SDM: Shared decision making.

The lecture on CPG knowledge included the following: definition of a CPG; CPG creation process; systematic review evaluation method and the risk of bias; and evaluation of the CPG approach.

The lecture on SDM knowledge included its definition and how it differs from informed consent, a summary of the nine steps of SDM[25], and the process of decision making.

"Education, attitudes and beliefs, interests, and perceived role in evidence-based practice (EPIC scale)" were considered the primary outcomes (Supplementary Table 1)[26]. The evidence based practice confidence (EPIC) scale is a self-administered questionnaire of 11 levels that evaluates the degree of self-efficacy in EBP. As the secondary outcome, knowledge of EBP[4, 6, 11, 12] was examined (Supplementary Table 2) using a questionnaire survey comprising 15 items on attitudes toward EBP, EBP education, and EBP-associated behaviors. A 5-point Likert scale (with options ranging from "Strongly agree" to "Strongly disagree") was used for the responses. All three groups were evaluated before and after the intervention.

The sample size was calculated based on the results of 30 participants who were tested in a different pilot study, separate from this research: effect size f=0.14, α error=0.05, power=0.8, minimal sample size=126. The participants in the pilot study differed from the participants in this research.

The trial was to be terminated by the principal investigator and research collaborator if: the number of participants did not meet the prescribed number; a participant dropped out due to unavoidable circumstances; the target number was not met; or the trial was judged to be disadvantageous for the participants. Participants were to be informed of the study's termination in writing, including a report of the known facts at the point of termination. Data were evaluated using an intention-to-treat analysis.

Based on prior studies, the following were determined as confounding factors: age[10, 11], gender, academic history[27], years of experience[10], certification as a physio/occupational therapist[12], stage of principal disease according to the hospital where the participants worked (acute, sub-acute, or chronic stages), primary disorder (orthopedic disease, developmental disorder, sports injury, spinal cord injury, post-amputation, psychiatric disorder, neuromuscular disorder, cerebrovascular disease, respiratory disease, cardiovascular disease, or other), weekly duty hours, number of therapists employed at the hospital[10, 11], number of occupied beds at the hospital[28], number of patients per day[10, 11], and participation in research activities[12]. Data on the aforementioned factors were gathered via a self-administered questionnaire, which was collected in an envelope to ensure anonymity.

Licensed therapists can acquire the qualification of certified or specialized physiotherapist/occupational therapist after completing the prescribed training and examinations. This qualification is established by the Japanese Physical Therapy Association (JPTA).

A significance test was conducted on the three groups to review the intervention effect of the workshop and lecture on SDM using CPGs. For the EPIC scale, a significance test was conducted per participant, with calculation of the mean both before and after the intervention. For the statistical analysis, because all three groups were evaluated before and after the intervention, a two-factor analysis of variance (mixed model) was adopted to conduct Holm's method in comparison to the post-hoc test. Similarly, if a significant difference between groups in the confounding factor was observed, the factor was considered a covariate. All statistical analyses were conducted using R (CRAN) (significance level <0.05).

RESULTS

The flowchart for participant selection is shown in Fig. 1. A total of 126 participants were randomly assigned to the various group. The application period for participants was from May 1, 2017, to April 30, 2018. There were no dropouts or untraceable participants in any of the groups.

Participants characteristics are shown in Table 2. There were no significant differences among the groups.

The results of the EPIC scale are shown in Table 3. There were significant mean differences for each group among the CPGs/SDM, SDM, and CPG groups (mean ± standard deviation, pre/post; CPGs/SDM group: 2.4 ± 0.9/4.4 ± 1.7; CPG group: 3.0 ± 1.5/3.5 ± 2.5; SDM group: 2.6 ± 1.2/3.3 ± 1.8).

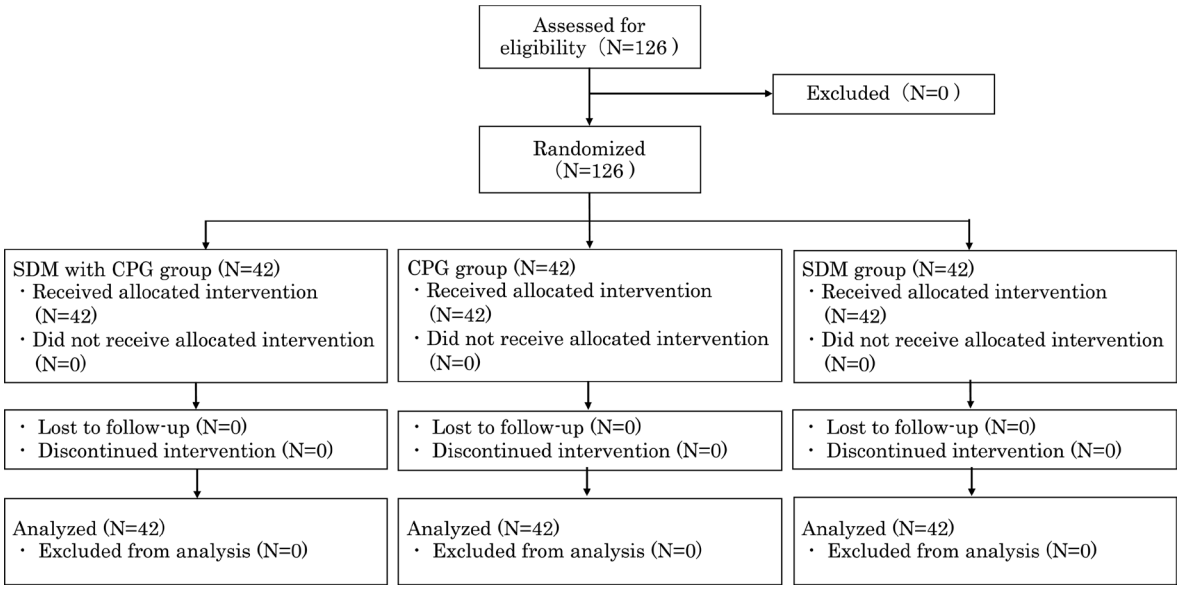

Fig. 1. Flowchart.
SDM: Shared decision making; CPG: Clinical practice guideline.

The results of the analysis showed significant differences among the three groups for the EPIC scale question items: "3. Effectively conduct an online literature search"; "9. Ask about needs, values, and treatment preferences"; and "10. Decide on a course of action".

Regarding the questionnaire on EBP, there were significant differences between the CPG with SDM and CPG group (mean ± standard deviation, pre/post; CPGs/SDM group: 1.8 ± 0.8/2.2 ± 1.0; CPG group: 2.3 ± 1.1/2.0 ± 1.0) for the question item, "11. I learned the foundations of EBP as part of my academic preparation" (Table 4).

DISCUSSION

It was evident from the results that CPG plus SDM education based on a workshop-style approach targeting physiotherapists and occupational therapists, increased reported self-efficacy in EBP, compared to the lecture-style approach to CPG or SDM education. This suggests that education on CPG should be conducted in parallel with SDM education to improve self-efficacy in EBP. There were three reasons for the improvement of self-efficacy in EBP that resulted from conducting SDM education using CPGs: first, the necessity of SDM for using CPG, because of the CPG definitions; second, the necessity of CPGs for practicing SDM, which is necessary for knowledge of standardized interventions in conducting SDM; and third, through simultaneous education on CPGs and SDM, therapists came to understand the uncertainty of rehabilitation interventions and the role of SDM.

The first perspective is that of "the necessity of SDM for using CPG", which is necessary for communication of education related to SDM. As mentioned above, a CPG is defined as "…a document that presents appropriate recommendations to assist patients and practitioners in making decisions regarding clinical practice of high importance based on a body of evidence evaluated and integrated by systematic reviews and the balance between benefits and harms[13]". Fujimoto and Kon stated that CPGs act as a communication tool that can support decision making between patients and medical practitioners. Providing education based on CPGs could lead to their effective application[29].

In the nine-step model[25] adopted for this study's SDM education, steps three to six focus on identifying patients' preferences and understanding them based on the benefits and risks shown by the relevant evidence. Understanding this process may lead to an increase in confidence in EBP. This study confirmed this hypothesis, as the CPG with SDM group scored higher for three items on the EPIC scale, including patients' preferences and understanding of the nine-step SDM model, compared to the groups that received only CPG or SDM education. Therefore, we concluded that when applied simultaneously, SDM and CPGs greatly increase self-efficacy in EBP.

The second perspective is that of "the necessity of CPGs for practice SDM", which is necessary for the knowledge of standardized interventions in conducting SDM. When applying SDM, knowledge of the applicable treatments and standard evidence in rehabilitation is indispensable during the steps, "presentation of treatment options" and "informing about the benefits and risks of the options". However, Japanese therapists' awareness of CPGs and relevant evidence is reportedly lower than that of therapists in other countries. Fujimoto, Kon, Takasugi, and Nakayama[12] targeted Japanese physiotherapists

Table 2. Participant's characteristics

		CPG with SDM (N=42)	CPG (N=42)	SDM (N=42)
Gender (N)	Male	31	34	26
	Female	11	8	16
Age (years)	Mean (SD)	28.1 (4.2)	27.3 (6.2)	28.6 (5.2)
Academic history (N)	Three-year professional school graduate	8	14	10
	Four-year professional school graduate	20	19	14
	Junior college graduate	3	3	2
	College graduate	11	6	16
	Master's degree	0	0	0
	Doctoral degree	0	0	0
Years of experience	Mean (SD)	6.1 (4.2)	5.4 (5.7)	6.3 (4.5)
License (N)	PT/OT (with national qualification)	40	41	40
	Certified PT/OT	2	1	2
	Specialized PT/OT	0	0	0
Stage of principal disease according to the hospital where the participants worked (N)	Acute	21	19	21
	Subacute	1	0	2
	Maintenance (including outpatient)	18	16	15
	Other	2	7	4
Primary disorder, according to the patients who the participants charged (N)	Orthopedic disease	10	6	8
	Developmental disorder	0	0	0
	Sports disorder	0	0	0
	Spinal cord injury	4	0	1
	Post-amputation	0	0	0
	Psychiatric disorder	0	0	0
	Neuromuscular disorder	1	0	2
	Cerebrovascular disease	27	30	29
	Respiratory disease	0	2	2
	Cardiovascular disease	0	4	0
	Other	0	0	0
Employment status (N)	Full-time	42	42	42
	Part-time	0	0	0
Weekly duty hours	Mean (SD)	40.0 (0.0)	41.8 (5.3)	40.5 (2.6)
Number of PTs/OTs at the hospital (N)	<3 therapists	0	0	0
	3–5 therapists	3	3	2
	6–10 therapists	2	5	5
	11–15 therapists	7	10	7
	>16 therapists	30	24	28
Number of occupied beds at the hospital		164.4 (69.5)	134.2 (81.9)	149.8 (100.7)
Number of patients per day	1–10 patients	17	24	18
	11–15 patients	25	14	23
	>16 patients	0	4	1
	None	0	0	0
Participation in research activities (N)	Yes	0	0	0
	Partially	6	9	12
	Not at all	36	33	30

SDM: Shared decision making; CPG: Clinical practice guideline; PT: Physio therapist; OT: Occupational therapist; SD: Standard deviation.
*Certified or specialized physio/occupational therapist is a qualification that licensed therapists can acquire after completing the prescribed training/examinations. This qualification is established by the Japanese Physical Therapy Association (JPTA).

Table 3. Results of the EPIC scale

	No.	CPG with SDM Group (N=42)		CPG Group (N=42)		SDM Group (N=42)		
		Pre	Post	Pre	Post	Pre	Post	
EPIC scale	1	2.4 ± 1.4	4.3 ± 2.2	3.6 ± 2.1	3.7 ± 2.0	2.8 ± 1.8	3.5 ± 1.8	
	2	2.7 ± 1.1	4.1 ± 1.7	2.8 ± 1.7	2.9 ± 1.8	2.9 ± 1.4	3.0 ± 1.7	
	3	3.2 ± 1.7	4.6 ± 1.4	3.3 ± 2.0	3.8 ± 2.1	3.0 ± 1.7	3.6 ± 1.7	*†
	4	2.6 ± 1.1	2.9 ± 1.6	2.6 ± 1.8	2.5 ± 1.8	2.6 ± 1.6	2.3 ± 1.3	
	5	2.0 ± 1.4	3.5 ± 1.7	2.6 ± 1.4	2.6 ± 1.6	2.1 ± 1.7	2.6 ± 1.5	
	6	2.0 ± 1.2	1.7 ± 1.5	1.5 ± 2.0	1.2 ± 2.0	1.5 ± 1.6	1.1 ± 1.6	
	7	1.7 ± 1.4	1.4 ± 1.3	1.1 ± 1.6	0.9 ± 1.8	1.4 ± 1.2	0.8 ± 1.3	
	8	2.0 ± 1.2	3.5 ± 1.6	3.3 ± 1.7	3.1 ± 1.8	2.6 ± 1.7	2.8 ± 1.7	*
	9	2.3 ± 1.2	5.0 ± 2.1	4.5 ± 2.3	4.0 ± 1.6	3.6 ± 1.9	3.9 ± 1.7	*†
	10	2.4 ± 1.2	4.4 ± 1.9	3.7 ± 2.2	3.0 ± 1.9	3.0 ± 1.8	3.4 ± 1.7	*†
	11	2.7 ± 1.4	4.4 ± 1.7	3.5 ± 2.1	3.5 ± 2.0	2.8 ± 1.8	3.3 ± 1.8	†
	Mean	2.4 ± 0.9	4.4 ± 1.7	3.0 ± 1.5	3.5 ± 2.0	2.6 ± 1.2	3.3 ± 1.8	*†

SDM: Shared decision making; CPG: Clinical practice guideline.
*CPG with SDM group vs. CPG group: $p<0.05$.
†CPG with SDM group vs. SDM group: $p<0.05$.
Mean ± standard deviation.
EPIC scale: "Education, attitudes and beliefs, interest, and perceived role in evidence-based practice" scale.

Table 4. Evaluation of EBP

	No.	CPG with SDM Group (N=42)		CPG Group (N=42)		SDM Group (N=42)		
		Pre	Post	Pre	Post	Pre	Post	
Evaluation of EBP	1	1.8 ± 0.8	2.2 ± 1.0	2.3 ± 1.1	2.0 ± 1.0	2.2 ± 0.9	2.2 ± 1.0	*
	2	2.3 ± 0.8	2.1 ± 0.7	2.0 ± 0.9	1.9 ± 0.9	2.2 ± 0.8	2.1 ± 0.9	
	3	2.2 ± 0.7	2.5 ± 0.9	2.3 ± 1.0	2.3 ± 1.1	2.3 ± 1.0	2.5 ± 1.0	
	4	3.9 ± 0.7	3.8 ± 0.8	3.9 ± 0.8	3.7 ± 0.8	3.7 ± 0.7	3.8 ± 0.8	
	5	4.1 ± 0.6	4.0 ± 0.9	4.0 ± 0.8	3.9 ± 0.7	4.0 ± 0.6	4.0 ± 0.7	
	6	2.3 ± 0.7	2.3 ± 0.9	2.1 ± 0.7	2.1 ± 0.7	2.1 ± 0.7	2.3 ± 0.8	
	7	3.7 ± 0.7	3.9 ± 1.0	3.7 ± 0.7	3.9 ± 0.7	3.8 ± 0.7	3.9 ± 0.8	
	8	3.8 ± 0.6	4.0 ± 0.7	3.9 ± 0.7	4.1 ± 0.6	3.9 ± 0.6	4.0 ± 0.7	
	9	2.7 ± 0.7	2.8 ± 0.6	2.9 ± 0.7	2.9 ± 0.6	2.7 ± 0.7	2.8 ± 0.6	
	10	2.4 ± 0.8	2.4 ± 0.8	2.6 ± 0.8	2.7 ± 0.7	2.5 ± 0.8	2.4 ± 0.7	
	11	4.0 ± 0.8	3.9 ± 0.7	3.6 ± 0.7	3.9 ± 0.8	3.4 ± 0.9	3.9 ± 0.9	
	12	3.9 ± 0.6	3.9 ± 0.7	4.0 ± 0.7	3.9 ± 0.8	3.6 ± 0.8	3.9 ± 0.9	
	13	3.9 ± 0.6	3.8 ± 0.6	3.5 ± 0.7	3.7 ± 0.7	3.4 ± 0.9	3.8 ± 0.8	
	14	3.9 ± 0.9	4.0 ± 0.7	3.8 ± 0.7	4.0 ± 0.7	3.7 ± 0.9	4.0 ± 0.8	
	15	3.8 ± 0.9	3.9 ± 0.8	3.5 ± 1.0	3.9 ± 0.7	3.5 ± 0.9	3.9 ± 0.7	

SDM: Shared decision making; CPG: Clinical practice guideline; EBP: Evidence based practice.
*CPG with SDM group vs. CPG group: $p<0.05$.
Mean ± standard deviation.

in researching awareness of EBP and found that although 54.9% acknowledged the significance of CPGs, CPG usage was below 30%, considerably lower than the usage rate of 61% in Western countries[11]. One reason could be the lack of therapist education on the usage of CPGs in Japan[12]. There may also be inadequate discussion, in Japanese practical education, of the types of situation in which CPGs should be used[30]. Therefore, education on the methods of communication between patients and therapists is necessary, to adopt CPGs as a source of information.

Third, through simultaneous education on CPGs and SDM, therapists came to understand the uncertainty of rehabilitation interventions and the role of SDM. In Japan, evidence in the field of rehabilitation is still being established. In an earlier study released by the JPTA using AGREE II (Appraisal of Guidelines for Research & Evaluation II), which assessed the quality of practice guidelines in physiotherapy, the scores were low[31]. In items pertaining to the rigorousness of the guideline production process, such as "Is an organized search method used to look for the evidence?", the median was 3.0 as low on a

7-point Likert scale, suggesting the need for improvement[31]. Similarly, the development of a database for diseases, such as cerebrovascular disease, femoral neck fracture, and spinal cord injury, is in progress to establish evidence regarding the effectiveness of rehabilitation[32]. However, the effectiveness of the database has not been verified to a satisfactory degree because of the lack of participating facilities; further improvement of the data quality is recommended[32]. Furthermore, education for pre- and postgraduates on methods of adopting evidence in clinical practice with patients as well as communication training has not yet been incorporated[31].

Considering this educational background in Japan, CPG education in conjunction with SDM education was conducted in this study. Such an educational method can convince therapists that SDM is suitable as a communication tool and that it can increase self-efficacy in EBP in clinical scenarios. Indeed, in studies targeting physiotherapists in western countries, approximately half favored SDM as their decision making approach in the rehabilitation field, with 28.9% implementing SDM in their clinical practice[33]. SDM is reportedly useful for involving patients in decision making, as it increases perceived self-efficacy[34, 35], enhances their understanding of a disease and its treatments[36, 37], and increases treatment satisfaction[38, 39]. Therefore, SDM is highly applicable as a communication tool in the rehabilitation field.

This study shows knowledge of evidence, using for the specific steps of SDM education, increased therapists' confidence in conducting EBP. Furthermore, they became convinced that the education method is applicable in clinical situations.

This study nevertheless had four limitations. First, because "awareness" of EBP was adopted as a main outcome, it was difficult to determine whether it was practiced in actual clinical situations. As the EPIC scale that was used as an index of self-efficacy in EBP is self-reported, it is unknown whether participants' behavior changed with respect to EBP in clinical situations or improved patient outcomes. Further research is required on behavioral changes with respect to EBP and improvement in patient outcomes when CPGs are used in SDM.

Second, the validity of the participant selection is questionable. As this study was carried out in medical facilities that agreed to cooperate in research on SDM and CPGs, it is possible that understanding and awareness of the two concepts were high among participants, compared to among individuals at other medical facilities. Whether the effectiveness of the education program varied with respect to differences in knowledge of SDM and CPGs before the intervention remains to be examined; consequently, the relationship between the target attributes as knowledge of SDM and CPGs before the intervention and the effectiveness cannot be determined.

Third, because the target was limited to Japanese medical facilities, the results may not be generalizable. It has been reported that Japanese therapists, compared to foreign therapists, have poor knowledge of EBP and CPGs[4, 10, 12]. In contrast to the United States and Australia, education on EBP and CPGs both before and after graduation, is less developed in Japan[4]. Therefore, differences in curriculum and knowledge should be verified when considering variations in the effectiveness of education.

The fourth limitation concerned the setting. In this study, many of the participating physiotherapists and occupational therapists worked in acute or sub-acute hospitals, mainly in the rehabilitation of stroke patients. For patients with stroke, rehabilitation treatment plans is low certainty according to various factors, such as illness severity, a premorbid lifestyle, and the level of assistance available from family members. For treatments with low certainty, the use of SDM, which encourages the patient to fully share and discuss their personal values, was recommended[40]. It was impossible to ascertain the level of SDM skills prior to the application of the intervention in this study. In the future, the communication approach must be examined carefully depending on the stage and condition of the disease.

Preprint publication

Fujimoto S, Ogawa T, Komukai K, et al. "Effect of Education on Physio and Occupational Therapists' Perceptions of Clinical Practice Guidelines and Shared Decision Making: A Randomized Controlled Trial," preprint posted online Jan 17, 2022. doi: 10.13140 / RG.2.2.12844.18567

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Funding

This work was supported by a grant from the Japan Primary Care Association.

Conflicts of interest

The authors declare that they have no competing interests to declare.

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