Clinical Decision Making Development of Clinical Physical Therapists under the Fee for Service and the Prescription of Physician

In-Hee Lee, PT, PhD1, Hye Young Lee, PT, MSc2

1Department of Physical Medicine and Rehabilitation, Keimyung University; 2Department of Rehabilitation Science, Graduate School, Daegu University

Purpose: The purpose of this study was to investigate the clinical decision making (CDM) development process throughout the comparison between novice and expert physical therapist as well as develop a CDM model for physical therapists under the fee-for-service (FFS) and physicians’ prescriptions.

Methods: Purposive sampling techniques were used to select 10 clinical physical therapists paired into five groups (each pair consisted of 1 novice and 1 expert physical therapist). The coding schemes were extracted from interviews and through within- and across-case analyses, cases were summarized. The reliability of coding schemes was confirmed by checking of case summaries by the participants.

Results: Novice and expert physical therapists were influenced by two themes, internalized theme and external forces or information. Novice clinicians depended more on external forces or information. Although clinicians should care patients under the FFS and physician's prescription, expert clinicians were more likely to rely on internalized knowledge.

Conclusion: The findings of the present study may be used by educators or association officials enhance CDM abilities and knowledge pools of student or novices as well as develop a guide to suitable novices or students under the specific context limiting the development of their CDM.

Keywords: Decision making, Knowledge, Physical therapists

I. Introduction

Clinical physical therapists have to make a variety of decisions for their patient’s care with uncertainties or ambiguity of knowledge about the patient and clinical practice. Clinical decision making (CDM) in physical therapy is based on functional recovery of patients. CDM is defined as a process of critical reasoning and problem solving to make decisions and plan treatment for effective care of patients. The progress of CDM describes the process of reasoning incorporating (1) data acquisition, (2) the generation of hypothesis from data, (3) data interpretation, (4) evaluation based on hypothesis, (5) decisions for care, and (6) implementation of interventions.

Under the Managed care and Medicaid national healthcare insurance, there are a few studies on CDM development, progress and abilities of physical therapists. According to the study by Payton et al., expert therapists follow the clinical reasoning process based on the gathered information such as problem list information, treatment plan. Using a ground theory method, Jensen et al. have reported that experienced physical therapists spent more time with patients than did novice therapists in providing hands-on care, seeking information and evaluating and educating the patient. The experienced therapists also spent more time in social interchange with patients as well as with patient education than did the novice therapists. In another Jensen et al. study, they found that master orthopedic physical therapists individualized their evaluation and teaching for each patient,
were more responsive in their therapeutic interaction with patients and integrated verbal encouragement and tactile cues with intervention than did the novice clinicians.

Using qualitative study based on the ground theory, Wainwright et al. investigated how factors, which influence CDM, were reflected according to differences of the clinical experience between novices and expert American physical therapists. Their study provided insight into how the participants made decisions as well as how prior experience contributed to the development of CDM abilities and informed the ongoing CDM process. In another study, novice and certified neurologic specialists revalidated similarities in skill performance but differences in reasoning process. The development of CDM skills depends on a variety of factors, including self-assessment and reflection as well as experience.

Physical therapists are prohibited initial contact with patient/client and locations for physical therapy services are limited to the clinic and hospital by the medical law and related regulations in Korea. The employment of physical therapists has being limited to the hospital founded by physicians. Physical therapists have to conduct physical therapy after a physician’s prescription despite their different areas of expertise. These restrictions of medical law and related regulations in Korea can affects the development and abilities of the physical therapist’s CDM. But, how practical knowledge gained through experience is influenced by an expert’s clinical decision in their limited practical environment is currently poorly understood.

The national healthcare insurance system of Korea adopts the fee-for-service (FFS) system. However the FFS system does not have well-established care standards to cover the all treatments and therapies. That is, the system only approves the medical insurance fee for the limited therapies. Therefore the therapies based on the expert CDM, which is developed by experiences and knowledge of expert, are limitedly offered to the patients. Moreover the development and maturation of the clinical physical therapists’ CDM may be difficult and limited under the FFS system. Even it may not possible to apply the CDM which is developed under the other insurance systems, because of the limitation of FFS system. But, there are little known about the CDM of the physical therapist who have conducted their mission by physician’s prescriptions under the FFS system.

Previous domestic studies regarding clinical physical therapist mainly investigated on subjective quality of life and to understanding of behavior in protecting patient’s medical information of clinical physical therapist. The purpose of this qualitative study was to 1) investigate the development of the CDM process of physical therapists with a comparison of the CDM for novice and expert physical therapists that conduct the physician’s prescription under the FFS national healthcare system, 2) develop a CDM model for physical therapists.

II. Materials and Methods

We believed a qualitative study would provide an understanding of the CDM process used by physical therapists in making plans for care and setting treatment goals after initial contact with patients. A qualitative study design with a grounded theory approach and data collection from the participant’s perspective was chosen to explore the CDM of clinicians during initial contact between therapists and patients. The reason that we selected the initial contact scene was that when the therapist makes initial contact with patient, they must mentally prepare a plan for care and treatment goals. Cheritz and Swanson described grounded theory as being based on a method of systematic collection and analysis of qualitative information to generate a theory that explains a social or psychological phenomenon.

1. Subjects
Purposive sampling techniques were used to pursue the purpose of this study. Participants were 5 pairs of physical therapists, with each pair consisting of 1 novice and 1 expert clinician (Table 1). One pair from each clinical site was selected to reduce bias. Therapists with less than 1 year of clinical experience were excluded to reduce potential bias. All participants were currently treating stroke patients at the 5 acute rehabilitation hospitals in South Korea.
Table 1. General characteristics of participants

<table>
<thead>
<tr>
<th>Participants</th>
<th>Pseudonym</th>
<th>Age (yr)</th>
<th>Gender</th>
<th>Entry-level degree</th>
<th>Post-entry level of degree</th>
<th>Continuing courses</th>
</tr>
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<tbody>
<tr>
<td>Novice group (1&lt;2)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>N1</td>
<td>26</td>
<td>Female</td>
<td>AA</td>
<td>AS</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>N2</td>
<td>28</td>
<td>Male</td>
<td>BS</td>
<td>BS</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>N3</td>
<td>27</td>
<td>Male</td>
<td>AA</td>
<td>AS</td>
<td></td>
<td>NDT</td>
</tr>
<tr>
<td>N4</td>
<td>26</td>
<td>Female</td>
<td>BS</td>
<td>BS</td>
<td></td>
<td>NDT</td>
</tr>
<tr>
<td>N5</td>
<td>28</td>
<td>Male</td>
<td>BS</td>
<td>BS</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Experienced group (&gt;10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E1</td>
<td>38</td>
<td>Male</td>
<td>AA</td>
<td>BS</td>
<td></td>
<td>PNF, NDT</td>
</tr>
<tr>
<td>E2</td>
<td>46</td>
<td>Female</td>
<td>AA</td>
<td>MSc</td>
<td></td>
<td>NDT, Bobath basic</td>
</tr>
<tr>
<td>E3</td>
<td>41</td>
<td>Male</td>
<td>BS</td>
<td>BS</td>
<td></td>
<td>NDT</td>
</tr>
<tr>
<td>E4</td>
<td>39</td>
<td>Female</td>
<td>AA</td>
<td>MSc</td>
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<td>Bobath basic</td>
</tr>
<tr>
<td>E5</td>
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<td>Male</td>
<td>BS</td>
<td>PhD</td>
<td></td>
<td>NDT</td>
</tr>
</tbody>
</table>

N: novice, E: experience, AA: associate of arts, BS: bachelor science, PhD: doctor of philosophy, NDT: neurodevelopmental treatment, MSc: master of science, PNF: proprioceptive neuromuscular facilitation.

2. Experimental methods

1) Data collection
Informed consent and permission for study were obtained from each therapist and patient. Before interviews, résumés of participants were thoroughly reviewed. Video method, mainly used in ergonomic evaluation, was adopted to observe the participants’ activities that interacted with the stroke patients. The initial contact scene with patients were preselected and then affirmed by participants. Participants were asked to think aloud the factor related to their own CDM. Moreover semi-structured interviews were also used to pursue in detail answers.

All interviews were recorded with a digital voice recorder and transcribed verbatim by investigators. Interview data were triangulated with artifact data. During each observation and interview, the investigator made notes and reflective memos to clarify activities, thoughts and statements made by the participants. This research design and methods used were previously reported.4,11

2) Data analysis
Open coding, a means of reducing the data to a set of important themes or categories, was began with of interviews, and résumés. All data were read and coded line by line. Data saturation was reached when the addition of subsequent participants no longer yielded new findings.

The within-case analysis was performed by merging and deriving of data for each therapist into a report summarizing all the information. Cross-case analysis which was begun from the within-case analysis was organized according to the categories and compiled. The cross-group comparison facilitated the development of an initial theoretical framework and identified a central phenomenon, defined as the main theme of the research, using criteria advocated by Strauss and Corbin.12

The coding scheme showed high reliability (92.5% agreement between 2 researchers; K=0.87). Whether data were low inference or not, we checked the case summaries by the participants for reliability of the data. To determine whether participants accurately represented their thoughts and words, they reviewed and affirmed their case summaries. A colleague with expertise in grounded theory who had not participated in data collection was analyzed.

III. Results

Two themes emerged from the open coding (Table 2). One theme, knowledge, is internalized into clinical physical therapy. The next theme was external force or information.

Table 2 depicts the factors that influenced the participant’s internalized CDM as knowledge and those that influenced the CDM as an external force or information throughout the open coding. The themes incorporated by the internalized knowledge were clinical experience, knowledge learned in
Table 2. Themes and corresponding factors

<table>
<thead>
<tr>
<th>Theme</th>
<th>Factor</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internalized knowledge</td>
<td>Clinical experience</td>
<td>Experience gain through interact with various patients and practice setting</td>
</tr>
<tr>
<td></td>
<td>Undergraduate education</td>
<td>Knowledge learned by lesson and hospital practice in college</td>
</tr>
<tr>
<td></td>
<td>Continuing education</td>
<td>Knowledge learned through academic degree or continuing courses, such as</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bobath, NDT</td>
</tr>
<tr>
<td></td>
<td>Anticipated patient function</td>
<td>Anticipated patient function level based on therapist’s experience or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>knowledge</td>
</tr>
<tr>
<td></td>
<td>Evaluation and observation</td>
<td>Knowledge gained through evaluated and observed by each clinician’s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>perspective, and evaluation tool</td>
</tr>
<tr>
<td>External force, or information</td>
<td>Physicians’ prescription</td>
<td>Due to medical law and free for service, each conduct according to medical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>doctor’s prescription</td>
</tr>
<tr>
<td></td>
<td>Medical information (ex, chart)</td>
<td>Information gained from medical chart, CT, MRI, and etc.</td>
</tr>
<tr>
<td></td>
<td>Want and need of patient</td>
<td>Health care service and return to previous life that patient want and need</td>
</tr>
</tbody>
</table>

NDT: neurodevelopmental treatment, CT: computed tomography, MRI: magnetic resonance imaging.

college, continuing education, anticipated patient functional level and therapists’ evaluation and observation. The external forces or information consisted of physicians’ prescription, medical information (e.g., medical chart, computed tomography [CT], magnetic resonance imaging [MRI], and etc) and the wants or needs of the patient and patient’s protector.

1. Clinical experience

Expert therapists think that accumulated practical knowledge is frequently used for care of patients and plan the management goal. The experiences which were obtained through the clinical therapies are the most valuable factors to the expert clinicians.

“I think I have believed my clinical decision for patient care. I have treated 10~11 patients in a day over 15 years. But, every patient is different. My practice experience used with every patient helps me see ‘the whole patient’ for patient/client management. My experience, to make clinical decisions about how I am going to approach for patient care, takes patient problems and the context, such as where they are came and go, and family supporter, into account. To solve a patient’s problem, I try to recall and use things from past successful cases and use these experiences to lead the way. I always think what’s important about patient care is the interaction with patients.”

Novice participants depended on medical charts or information such as the medical physician’s prescriptions, medical records on diagnosis, history of present illness and past medical history to make a clinical decision.

Novice (N) 3 illustrates the scene when he first made contact with a patient.

“I am not sure where the recovery of patient’s disease will go and what is patient’s main cause of abnormal movement because I actually am somewhat afraid of this new patient. Physician transmits a prescription for the patient and that prescription tells me some information and direction for patient treatment. But I know that don’t tell me about all of patient movement. I have to evaluate the patients’ disability and a set treatment plan on the basis of the physician’s diagnosis. I feel some burden when I have contact with a new patient.”

Next paragraph was an additional example commented by N5, another novice.

“Before patients come into physical therapy, I read the physician’s prescription, medical charts and progress notes. That gives me key information about the patient.”

2. Knowledge learned in college

All the novice participants indicated that their undergraduate education in physical therapy greatly influenced their CDM development. N1 and N4 exemplified that the knowledge in college facilitated development of their CDM abilities. “I think the undergraduate curriculum in college was helpful to make...
clinical decisions because undergraduate curriculum provided critical pathways of a patient’s disease.” N3 noted clinical practice class, one of undergraduate curricula, facilitated the development of CDM: I saw and learned expert physical therapy interaction with patients.

N2 emphasized undergraduate education as well as mentorship: N2 described I learned the pathology and physiology of most diseases we frequently encounter. Classes with neuroanatomy and clinical kinesiology helped me to understand patient problems and to make clinical decisions. N2 also noted her mentor, who explained and guided the progress of the patient and their recovery. She re-enforced that mentorship is important for beginners. She commented that mentorship, such as medical internship, is introduced to physical therapy, CDM of novices would be well-developed. But, mentor systems are difficult at present in the Korea healthcare system since physical therapists must be employees for hospital revenue.

Expert physical therapists did not comment about knowledge learned in college.

3. Continuing education
Clinical experience was cited most frequently by all experienced participants. Expert participants provided experiential learning activities that afforded opportunities to apply their skills and knowledge to practice. Expert clinicians asserted continuing education as a particularly relevant factor. All expert participants attempted to apply continuing education into their own clinical practice. All of the expert participants’ CDM abilities evolved and the clinical practice became more collaborative throughout the experience.

With regard to continuing education, although experience (E1) did not get a Master’s of Science degree, she finished Proprioceptive Neuromuscular Facilitation (PNF) and Neuro Developmental Treatment (NDT) courses. E1 acquired task-oriented treatment from peers and the literature and accumulated practical experience. E1 recognized course works and task-oriented problem solving as a major factor contributor to her CDM development and approach to patients.

“I attended a 1 month NDT and a 3 week PNF courses. I learned ideas from those courses. I just think that those experiences influenced how I really plan treatment and set goals. I think this is most influential in what I do for patients.”

E2 and E3 are experienced clinicians who graduated with a Master’s of Science or PhD degree.

E2 described journal reviews, motor control lesson and his Master’s degree thesis that influenced his CDM development and patient treatment. E3, with a PhD degree additionally highlighted 20-25 papers submitted to domestic journal and Science Citation Index Expanded (SCIE) as a major factor contributing to his CDM for the care of patients.

With regard to continuing education, all novice clinicians want to accumulate clinical knowledge from special courses in the future.

N2 described the need of continuing education.
“1 showed and mimicked a senior therapist’s approach to the patients. He considers multiple aspects of patients, such as environmental status, family support and the patient’s expectation. I think he has a great interaction technique with patient/client because he has learned from courses for patient care. Therefore, I want to pursue continuing education in the future.”

4. Hypothesis generation for functional level to be reached
Both groups generated a hypothesis for treatment plan and set goals on the basis of anticipated function level. Expert clinicians judged with a firm belief. In contrast, novices used the trial and error approach.

The following excerpt is an example of comments made by N3.
“When patients come in, I want to know how well patients do from the supine position to sitting, from sitting to standing, keeping balance standing and walk on stairs. Then I try to have them walk with a cane and give cues. I really don’t know how much those cues help the patient walk and thus I try to perform some activities for evaluation on patient’s functional level.”

E5 showed confidence on the patient’s progress.
“I want to stretch the truth. When I only touch and see a patient, I know the patient’s functional level to be recovered if patients have the will to participate in rehabilitation.”
he said “I can show the patient’s progress and their future through the clinical experience. The Berg balance and a Fugl-Meyer examination are the only administrative activities, at least for me.”

5. Personal experience

E2 described about his personal experience.

“She has two sons. As a mother, I have nurtured my sons and helped their development. I think that those experiences were helpful for me to make clinical decision for post stroke. There is no difference between their development and recovery of post stroke patients.

6. Use of patient’s information

Expert clinicians depended on the evaluation and observation from the view of their own perspective rather than the physicians’ prescription. They only used the medical chart and physicians’ prescription to support their CDM.

E4 commented, “I first observe the patient’s gait pattern or sitting posture and movement on the wheelchair when a patient comes in, and evaluate his/her motor, sensory and cognitive function for motor learning skills. I generally have used the Fugl-Meyer scale and the Berg balance scale for the evaluation of patients. I compare between clinical aspects caused by the lesion of the patient as well as the medical record and MRI, or CT in order to predict expectations to be recovered and the functional level. And then, I make a treatment plan for that patient and set short term and long term goals. Of course, when I make a clinical decision, I place my evaluation results as priority.

E3 also emphasized, “When I set plans for patient care, the paper prescribed by a physician or medical record supported my decision as a reference.”

N5 illustrated his initial observation and evaluation.

“Before a patient comes in, I thoroughly scrutinized the medical records, vital signs, MRI and CT information and then I try to infer the clinical aspect of the patient. It’s really hard for me to make a connection between the medical information and the clinical aspects of the patient. But, I try to set my hypothesis for patient recovery and set a plan and intervention according to that hypothesis.”

7. The CDM definition

The CDM definitions used by novice participants were that N2 described “The plan to improve the function level of patient”, and “therapist’s mental process that occur in the brain”. N4 described “The therapist’s plan to help limited range of motion of patient recovery to normal through the passive, active, and active assist exercise as well as strengthening exercise”. N5 answered “To functional recovery of patient, the plan of therapist, such as range of motion exercise, maintain muscle lengthening to prevent contracture, and control abnormal muscle tone and postural tone, is CDM”.

The definitions employed by experienced participants were remarkable for the extent of integration of those concepts.

E1 commented that critical reasoning is the most important factor to CDM. I employed the information from the medical charts, MRI and CT and the patient’s evaluation that I found. “On my treatment planning, my first decision was based on what the functional level of patient would be reached.” E3 described that my treatment planning is based on human dignity, keeping up quality of life: I have and then try to make decisions on the basis of the patient center model. E4 described that the process of critical reasoning is CDM. I’d evaluate the reason inducing patient’s physical and related problem. I try to see the whole patient for the recovery of functional movement, cognitive function, environment, such as living, familial support, economical, the life after return to home.

IV. Discussion

The purpose of this study was to gain an understanding of development process of the CDM, and differences of abilities throughout the comparison of novice and expert physical therapists under the FFS and physicians’ prescriptions, and develop a CDM model of physical therapists through a qualitative study based on the ground theory.

The internalized knowledge theme was unwittingly influenced therapist’s CDM without time wasting. External forces or information themes directly influenced the therapist’s
decision before therapist-patient interaction. Through the across-case analysis, the differences in how novice and expert participants used factors influencing CDM to make decision are condensed into Figure 1. Consistent with previous studies under the other healthcare system, medical law and related regulation, novice clinicians relied more on external forces, whereas experienced clinicians used more internalized themes.\textsuperscript{2-4,13} Novices do not have the sufficient experience to synthesize and incorporate their thoughts about patients and clinical reasoning of patients. Novice participants have not yet developed of their CDM. They want to avoid and reduce a high degree of uncertainty they are confronted with. Therefore, the CDM of novice clinicians maybe reflect the prescription of physician or external information rather than their own clinical reasoning. Therefore, they depend on external forces or information to confirm their decision. They want to be excellent physical therapists through continuing education and/or their clinical experience. These findings of the present study were similar to previous studies where the CDM of the physical therapy student focused more on a diagnosis and/or clinical symptoms and impairment due to their inexperience.\textsuperscript{14} Those reasons may be why physical therapists do not have the first responsibility for physical therapy because the prescription of physicians.

There were distinct differences between FSS and the other national healthcare system. We postulated that a physician’s prescription may influence the development of the CDM of physical therapists, and therefore expert Korean physical therapists do not establish their own CDM development and abilities well because they have cared for patients for a few decades under this system. But no matter what the national healthcare insurance is, the present study did not differ from previous research.\textsuperscript{2} Expert clinicians used their domain-specific knowledge through observations and interaction with patients.\textsuperscript{15,16} Expert clinicians used their knowledge pool and interacted with patients to arrive at clinical decisions. Expert and experienced physical therapists evaluated the patient’s symptom and functional level through their experience and see the whole patient. Experts in the physical therapy domain relied more on their so-called own forward reasoning, a collaborative process with patients and also involved Schön’ s reflection in action (differentiation one’s reflecting while experiencing the event from reflecting after the event).\textsuperscript{17-22} The finding of the present study reported that expert physical therapists relied more on their own clinical experience rather than the prescription of physicians. But, a recent study reported that physical therapists used clinical reasoning that required the ability to integrate medical information.\textsuperscript{23} The difference with the present study may be represented because that study was designed in the acute care setting that required crowd, fast-paced and rapid decision making.

Expert clinicians employed their clinical experience and knowledge for atypical cases to evaluate and treat. E3 provided an example specific to this factor: “This stroke patient is right side neglect. This case is unusual. Neglect, anosognosia symptoms were very severe. Global aphasia is also severe. He did not show motor learning functions. It is difficult to make eye contact with him. His cognitive function also is very severely damaged. He cannot perform supine to sitting, sitting to standing and keep a standing balance. He reacts as if he doesn’t understand my request. I have not seen his MRI. He can walk in his house at least. My experiences tell me these things. I will treat to increase his proprioception. I would expend the time he is staring at his right side. According to the level of his recovery, he will practice walking”.

All of the participants recognize need of clinical experience and continuing education to progress their CDM abilities. Accumulating clinical experience through the interaction with various patients and continuing education, such as
professional courses, and a graduate degree may reduce the amount of uncertainty and help to extend the CDM knowledge pool of clinical physical therapists.

1. Development of expert CDM model

Within-case analysis investigated the factors that influenced the development of the participant’s CDM within each group. The initial CDM model is shown in Figure 2. Evaluation that therapists do themselves, prescription of physician, as well as want and need of patients provoke the therapist’s knowledge pool, and that connect to CDM for treatment plan and setting goal in the practical setting.

Figure 3 shows the evolution from the initial to the revised CDM model. Throughout this study, the initial CDM model was revised to illustrate the use of their knowledge pool to generate the CDM of physical therapists for patient treatment. Although the scope of this article was to study the CDM development of physical therapists under the FFS healthcare system and physician’s prescription, Figure 2 depicts the role of the knowledge pool that informs the CDM and patient treatment and is expanded. Throughout interaction with patients, clinicians accumulate their clinical experience and increase their knowledge pool. And continuing education helps to expand their knowledge pool. Knowledge has long been recognized as a major component of effective decision making. It is clear that a wealth of knowledge is needed in order to be an “expert” at any area. Knowledge relevant to performance in a particular domain of activity is accrued over thousands of hours of practice. Knowledge affects a great influence on the well-structured decisions. That is demonstrated in another study that highly knowledgeable individuals were significantly more accurate than low knowledge individuals on well-structured decisions. This revised model was supported by a previous study in the

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Figure 2. The clinical decision making of experienced physical therapists. CDM, clinical decision making.

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Figure 3. The initial and revised clinical decision model of physical therapists. CDM, clinical decision making.
expert–novice literature is that highly knowledgeable individuals show a strong link with domain-related concepts. Based on these previous studies and the findings of the present study, the revised CDM model incorporates the knowledge pool earned through clinical experience and education play an important role in the development and progress of CDM abilities of physical therapists. In future studies, an understanding of how knowledge level affects the decision process are needed if that decision affects to quality of results.

Under the FFS and physician's prescription, the findings of the present study has provided a deeper understanding of CDM abilities and progress of physical therapists within the context of clinical experience and knowledge.

Our interpretation of the therapist’s CDM generation was limited by the research method and data collection. In the present study, data were generated from a “think out loud” method of interviews and written personal and therapeutic resumes. This method did not allow an analysis of CDM in actual intervention sessions or in regard to specific clinical examples. Although not the intent of this study, our results were unable to determine whether the decision-making process actually had an impact on the recovery of patients or whether their CDM was the best choice for patient in terms of their physical therapy outcomes. Although the present research studied in greater depth of therapist’s CDM development and abilities, the finding cannot regard to broad therapists because this was a qualitative research with small number of therapists. Another related limitation is the manner in which therapists were classified as expert (> 10) and novice (1 < n < 2) years of experience, and the sample was limited to only 5 groups. If intermediate clinicians were included in present study, the development process of the CDM might be demonstrated. This study only reflected the CDM in the initial contact scene between therapists and post stroke patients. The finding of the present study limited the extent to which the results may be applied to physical therapists providing other care, such as acute care, orthopedic and cardiopulmonary care. Future study is recommended to reflect the actual long term effect of physical therapy that clinicians with different level of knowledge and skill provide.

As the Ryu and Park’s study also indicated the need for physical therapy education for the clinical reasoning process, the finding of this study also would be used by educators to develop and provide curriculum with opportunities to facilitate CDM abilities of novices and students. Association officials also need to consider developing a guide, such as Guide to Physical Therapist Practice of America Physical Therapy Association, for novices and student under the FFS healthcare system as well as medical and related regulations.

Author Contributions

Research design: Lee IH, Lee HY
Acquisition of data: Lee IH, Lee HY
Analysis and interpretation of data: Lee IH, Lee HY
Drafting of the manuscript: Lee IH, Lee HY

References

reflection is used to inform the clinical decision-making process. Phys Ther. 2010;90(1):75-88.

(Appendix)

1. The major questions asked in the interviews were as follows:

2. How would you define the clinical decision making (CDM) in physical therapy?

3. What are you doing in this portion and what is its purpose?

4. Talk about what kinds of thoughts that go through your head in this portion?

5. What was it about this patient that indicated this would be an effective intervention?

6. How did you come to reach those conclusions? Where did you learn that?

7. How did your physician’s prescription influence your CDM?