Importance and utilization frequency of essential competencies of Korean physical therapists

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Background/rationale

It is difficult to present a single definition of physical therapy because physical therapy is defined in different ways in various countries, depending on the length of education required and legal circumstances. However, the World Federation of Physical Therapists defines physical therapists as “persons engaged in healthcare related to providing functional enhancement, damage prevention, rehabilitation treatment, intervention, and recovery service, while maintaining and developing motion and functional capabilities when individuals’ movements and functional capabilities are impaired by age, damage, disease, disability, environmental factors, etc.” [1]. The Korean Physical Therapists Association defines physical therapy as “helping to relieve patients’ pain and further restoring normal social activities by developing and applying physical materials, such as electricity, light, water, air, sound, and exercise, and various instruments and machines for therapeutic purposes, rather than surgery and pharmacological therapy” [2]. Upon comparing the 2 definitions, the Korean Physical Therapists Association suggested that physical therapy is performed using physical materials such as exercise therapy and various instruments and machines, whereas the World Federation of Physical Therapists refers to it as encompassing various services, as well as physical materials, and as including information related to diagnosis, evaluation, and prevention. Thus, it is necessary to redefine the competencies of Korean physical therapists. Changes in the population and disease structure, changes in the medical environment (e.g., advances in medical technology), and subsequent changes in medical personnel–related policies are major factors related to the physical therapist competencies required by society [3]. Korea has become an aging society, with > 14% of the population aged ≥ 65 years, and is expected to become a super-aging society in the near future [4]. In preparation for the upcoming super-aging society, the role of physical therapists in disease prevention and the provision of healthcare for the elderly is expected to increase. Furthermore, it is estimated that the national costs of healthcare will continue to increase according to the public’s perception of quality of life, the increase in the use of medical services, the overuse of high-tech expensive medical equipment, and the need for healthcare for the elderly and high-quality medical services. Therefore, it is necessary to improve the quality of physical therapy services to align with changes in the public’s awareness of health promotion and increasing national medical costs [3].
Objectives

To cope with the changing healthcare environment, it is necessary to investigate the essential competencies in the clinical practice of physical therapists and to reflect these results in the physical therapy training process. Therefore, in this study, we aimed to provide basic data for the training of physical therapists and policy development by analyzing perceptions of the importance of physical therapists’ competencies and the frequency of the utilization of those competencies.

Ethics statement

Informed consent was obtained from all participants.

Study design

This was a survey-based descriptive study.

Participants

We surveyed licensed physical therapists in Korea who had clinical experience in physical therapy using a Google questionnaire on mobile devices and PCs. A total of 296 (99.0%) of the 299 subjects responded to the survey questionnaires from September 16, 2019 to September 30, 2019 (Dataset 1). The characteristics of participants are shown in Table 1.

Technical information

The survey items consisted of 4 areas: basic medicine (30 questions), diagnosis and evaluation (38 questions), interventions (43 questions), and other competencies (9 questions) including communication capabilities, professional education and development capabilities, and health personnel’s ethical and interpersonal capabilities (Table 2). The 120 evaluation items are presented in Supplement 1 in Korean and in Supplement 2 in English. In addition, the Cronbach α coefficient was calculated for the reliability of the test in each subcategory, and all reliability coefficients were higher than 0.7 (Table 2). The questionnaire was prepared based on the 2012 job analysis of physical therapists, the 2015 job analysis of physical therapists, learning goals, an analysis of national test linkage, and the national test of physical therapists presented by the Korea Health Personnel Licensing Examination Institute [5,6]. The questionnaire used in the study was validated by 9 experts, including a professor of physical therapy. The subareas of each item were detailed and presented to the subjects (e.g., “Do you think this item is important and has a relatively high clinical utilization?”). The survey responses were a 5-point Likert scale ranging from 1 (not entirely important/very low utilization) to 5 (very important/very high utilization) for the importance and frequency of use of the surveyed competencies.

Statistical methods

The data were analyzed using SPSS for Windows ver. 15.0 (SPSS Inc., Chicago, IL, USA). Frequency analysis was conducted to identify the general characteristics of the research subjects, and repeated-measures analysis of variance (ANOVA) was performed to analyze the differences in the importance and frequency of utilization of competencies according to the 4 categories (basic medicine, diagnosis and evaluation, interventions, and other competencies essential to physical therapists). To examine the statistical significance of differences in scores according to category, a follow-up test was conducted using the least significant difference (LSD) method. The statistical significance level was set at 0.05.

Differences in the importance of essential competencies of physical therapists according to category

Repeated-measures ANOVA was performed to analyze the im-

| Table 1. General characteristics of the respondents |
|-----------------------------------------------|
| Characteristic | Category | Person (%) |
|-----------------------------------------------|
| Sex | Male | 159 (53.7) |
| | Female | 137 (46.3) |
| Age (yr) | 20 | 147 (49.7) |
| | 30 | 82 (27.7) |
| | 40 | 42 (14.2) |
| | > 50 | 25 (8.4) |
| Highest level of education | College graduate | 197 (22.3) |
| | Master’s | 50 (16.9) |
| | PhD | 49 (16.6) |
| Career (yr) | < 3 | 106 (22.6) |
| | 3–10 | 102 (18.9) |
| | > 10 | 88 (19.6) |
| Place of employment | Primary medical institution | 63 (21.3) |
| | Secondary medical institution | 100 (28.7) |
| | Tertiary medical institution | 60 (20.3) |
| | University | 47 (15.9) |
| | Others | 26 (5.1) |
| Specialization | Musculoskeletal system | 140 (47.3) |
| | Nervous system | 127 (42.9) |
| | Cardiovascular system | 8 (2.7) |
| | Integumentary system | 2 (0.7) |
| | Others | 19 (6.4) |
The importance of essential competencies of physical therapists. First, differences in the categories of basic medicine, diagnosis and evaluation, interventions, and other competencies showed statistical significance (F = 129.33, P < 0.01), with the following mean and standard deviation (SD) scores: diagnosis and evaluation (4.45 ± 0.48), interventions (4.42 ± 0.50), other competencies (4.36 ± 0.52), and basic medicine (4.06 ± 0.50) (Table 2). The LSD post-test for the statistical significance of differences between each category showed the following significant results: basic medicine versus other competencies (M_dif = 0.30, P < 0.01), other competencies versus interventions (M_dif = 0.06, P < 0.01), and other competencies versus diagnosis and evaluation (M_dif = 0.08, P < 0.01) (Table 3).

**Differences in the frequency of utilization of essential competencies of physical therapists**

Repeated-measures ANOVA was performed to analyze the frequency of utilization of essential competencies of physical therapists (Table 4). First, an analysis of differences according to category showed statistical significance (F = 42.98, P < 0.01), with mean and SD scores as follows: other competencies (4.14 ± 0.58), diagnosis and evaluation (4.14 ± 0.62), interventions (4.08 ± 0.63), and basic medicine (3.89 ± 0.50) (Table 4). The LSD post-test for the statistical significance of differences between each category showed the following significant results: basic medicine versus other competencies (M_dif = 0.30, P < 0.01), other competencies versus interventions (M_dif = 0.01, P < 0.01), and other competencies versus diagnosis and evaluation (M_dif = 0.03, P < 0.01) (Table 4).

**Interpretation and suggestions**

Previously, physical therapy in Korea focused on treatment using basic medical techniques using physical materials, such as electricity, light, water, air, sound, and exercise therapy, as well as various instruments and machines, due to the limitations of the medical system wherein interventions are conducted under the guidance of doctors (Table 4). However, it is becoming increasingly important for physical therapists to focus on their diagnosis and evaluation capabilities in order to interpret patients’ status (Table 3). Therefore, for future physical therapy curricula and national exams to present reasonable educational objectives that reflect important practical job competencies of physical therapists, it is necessary to increase the number of hours of education on the subjects of diagnosis, examination and evaluation, and clinical de-

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**Table 2. Essential competency areas and subareas**

| Areas                               | Reliability (Cronbach’s $\alpha$) | Subareas                                      | Reliability (Cronbach’s $\alpha$) |
|-------------------------------------|-----------------------------------|-----------------------------------------------|-----------------------------------|
| Basic medicine (30)                 | 0.933                             | Anatomy (10)                                  | 0.874                             |
|                                     |                                   | Kinematics (4)                                | 0.717                             |
|                                     |                                   | Physical agent modalities (16)                | 0.936                             |
| Diagnosis and evaluation (38)       | 0.961                             | Principle of diagnosis and evaluation (8)     | 0.901                             |
|                                     |                                   | Musculoskeletal system examination and evaluation (6) | 0.874                             |
|                                     |                                   | Nervous system examination and evaluation (11) | 0.911                             |
|                                     |                                   | Cardiopulmonary blood relation examination and evaluation (6) | 0.939                             |
|                                     |                                   | Clinical decisions (6)                        | 0.905                             |
| Interventions (43)                  | 0.969                             | Musculoskeletal interventions (8)             | 0.863                             |
|                                     |                                   | Neurological interventions (8)                | 0.890                             |
|                                     |                                   | Cardiopulmonary blood relations interventions (5) | 0.898                             |
|                                     |                                   | Skin system interventions (2)                | 0.929                             |
|                                     |                                   | Physical therapy in the community (2)        | 0.951                             |
|                                     |                                   | Physical therapy for children and adolescents(4) | 0.952                             |
|                                     |                                   | Physical therapy in sports (3)               | 0.960                             |
|                                     |                                   | Physical therapy for the elderly (4)         | 0.923                             |
|                                     |                                   | Physical therapy for women (2)               | 0.942                             |
|                                     |                                   | Medical care regulations (5)                 | 0.921                             |
| Other competencies (9)              | 0.914                             | Areas of communication (4)                   | 0.804                             |
|                                     |                                   | Professional training and development (2)    | 0.853                             |
|                                     |                                   | Medical personnel’s ethical and interpersonal personal capabilities (3) | 0.912                             |

Parentheses indicate the number of questions.
cision-making, and to reflect that emphasis in examinations [3]. The resultant improvements in physical therapists' diagnostic evaluation competency will increase their ability to accurately identify patients' problems and to verify the effectiveness of interventions and treatment methods based on those results [7,8].

As the role of Korean physical therapists is based on the International Classification of Functioning, Disability, and Health, which integrates the individual and social models of disability, should be taken to identify the multidimensional effects of disease, social participation, and health status. In addition, appropriate treatment interventions and measures should be presented according to the results of analyses using more diverse approaches. Therefore, it is estimated that the frequency of utilizing competencies in the diagnosis and evaluation category and in the category of other competencies (personal and environmental factors, etc.) was higher than that of the competencies in the category of interventions (Table 3). Among the duties of physical therapists, diagnosis and evaluation-related tasks were considered to be more important and more frequently used than those related to interventions. Therefore, it is necessary to increase the proportion of diagnosis and evaluation in the Korean physical therapist training system to match the frequency of utilization of this competency.

**Conclusion**

It is necessary to increase the proportion of credits in university education for diagnosis and evaluation–related competencies, which were recognized to be highly important and frequently utilized, as shown in this study, and to develop evaluation criteria that can enhance physical therapy capabilities by reflecting these considerations in the standards for national examination questions.

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**Authors’ contributions**

Conceptualization: JL, HGK, CSA. Data curation: TO, JSO, WI, Ji, SKH, YSP. Formal analysis: TO, JL, WL. Funding acquisition: CSA. Methodology: JL, SKH, YSP. Project administration: JL, HGK, CSA. Writing–original draft: JL. Writing–review & editing: JC, TO, JSO, WL, JL, SKH, YSP, HGK, CSA.

**Table 3.** Analysis of the importance of essential competencies of Korean physical therapists

| Importance of essential competencies for physical treatment | Mean ± standard deviation | Sum of squares | Degree of freedom | Mean squared | F-value | Post-hoc |
|-------------------------------------------------------------|---------------------------|----------------|------------------|-------------|---------|----------|
| Basic medicine                                              | 4.06 ± 0.50               | 27.94          | 2.14             | 13.09       | 129.33**| 1 < 4 < 2,3 |
| Diagnosis and evaluation                                    | 4.45 ± 0.48               |                |                  |             |         |          |
| Interventions                                               | 4.42 ± 0.50               |                |                  |             |         |          |
| Other competencies                                          | 4.36 ± 0.52               |                |                  |             |         |          |

1: basic medicine, 2: diagnosis and evaluation, 3: interventions, 4: other competencies (communication capabilities, professional training and development capabilities, and medical personnel’s ethical and interpersonal capabilities).

**Table 4.** Frequency analysis of the utilization of essential competencies of physical therapists in Korea

| Frequency of the utilization of essential competencies of physical therapists | Mean ± standard deviation | Sum of squares | Degree of freedom | Mean squared | F-value | Post-hoc |
|-----------------------------------------------------------------------------|---------------------------|----------------|------------------|-------------|---------|----------|
| Basic medicine                                                              | 3.89 ± 0.89               | 13.08          | 2.32             | 5.64        | 42.98**| 1 < 3 < 2,4 |
| Diagnosis and evaluation                                                    | 4.14 ± 0.14               |                |                  |             |         |          |
| Interventions                                                               | 4.08 ± 0.08               |                |                  |             |         |          |
| Other competencies                                                          | 4.16 ± 0.16               |                |                  |             |         |          |

1: basic medicine, 2: diagnosis and evaluation, 3: interventions, 4: other competencies (communication capabilities, professional training and development capabilities, and medical personnel’s ethical and interpersonal capabilities).

**P<0.01.**
Conflict of interest

No potential conflict of interest relevant to this article was reported.

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Data availability

Data files are available from Harvard Dataverses: https://doi.org/10.7910/DVN/XYM7XQ
Dataset 1. Response data from 299 subjects.

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Supplementary materials

Data files are available from Harvard Dataverses: https://doi.org/10.7910/DVN/XYM7XQ
Supplement 1. Survey items in Korean.
Supplement 2. Survey items in English.

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