

A Survey on Awareness of Physical Therapists about Cardiopulmonary Physical Therapy

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Purpose: The purpose of this study is to investigate awareness of physical therapists about cardiopulmonary physical therapy and patterns of its use, and to offer materials about how to apply cardiopulmonary physical therapy.

Methods: For this study, structured questionnaires were distributed to 158 physical therapists in general hospitals, hospitals, Chinese medicine hospitals and clinics in Cheonnam area who were randomly selected as research subjects. After the questionnaires were handed out to them for 180 days from July to December 2013, they were collected.

Results: The results showed that only 14 respondents(25%) knew about the therapeutic intervention of cardiopulmonary physical therapy, while respectively, 57.1% and 17.9% of them responded they didn't know about it well, and they didn't know about it, at all. As a result, physical therapists' awareness about cardiopulmonary physical therapy was at an extremely low level, overall. Moreover, 60.7%, 7.1%, 8.9% and 23.3% of the subjects answered that they obtained knowledge about cardiopulmonary physical therapy from school curriculum, from association seminars, from related books and from other sources, respectively.

Conclusion: In conclusion, these results demonstrate that the application or use of cardiopulmonary physical therapy as a physical therapy intervention is quite inadequate, although the necessity for cardiopulmonary physical therapy of physical therapists is being highlighted. Therefore, constant interests and efforts of physical therapists and clinicians would be required for effective use of cardiopulmonary physical therapy, clinical verification and active researches on it.

Key Words: Awareness, Cardiopulmonary Physical Therapy, Physical Therapist

I. Introduction

Due to the rapid economic growth and industrial development, there is an increasing number of patients who suffer disabilities for various industrial accidents in modern society, and the stretched average life due to the advancement in modern medical science has caused the rise in population of the aged. Therefore, functional rehabilitation treatment

for damage from disasters and accidents and physical rehabilitation treatment for chronic disasters and aging are increasing, and roles of physical therapy and physical therapists specializing rehabilitation are becoming more important in the field of medical service.¹ Currently, physical therapists are working actively in medical institutions(general hospital, hospital, oriental medicine hospital, dental hospital, clinic, etc.), rehabilitation centers, social welfare centers, rehabilitation centers for the disabled, public health centers, elderly care facilities, sports clubs and others, and the demand for physical therapists are gradually increasing, as well.²

Physical therapists in hospitals are handling comprehensive and diverse works ranging from hyperthermia, electrotherapy, phototherapy, hydrotherapy, and mechanical and appliance

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therapy using various physical factors to manual therapy and therapeutic exercise using physical therapist's body, but there is a relative lack of work systems of professional fields of physical therapy like nervous system, musculoskeletal system and cardiopulmonary system, and professionalism in job performance is continuously falling.³ Cardiac rehabilitation is an intervention to help people recover from heart attacks, heart surgery and percutaneous coronary intervention procedures such as stenting and angioplasty. Cardiac rehabilitation usually provides education and counseling services to help heart patients increase physical fitness, reduce cardiac symptoms, improve health and reduce the risk of future heart problems, including heart attack,⁴ and pulmonary physical therapy is related to a gas exchange ability, and is learned to help in controlling moisture and temperature by absorbing oxygen and releasing carbon dioxide, as an essential element to maintain physical functions and develop an exchange organically.⁵ For making these functions last, sufficient physical activity or proper exercise is done to improve respiratory functions, and this stimulates respiratory centers and vitalizes respiration due to pH, oxygen, the rise in body temperature and hormone effect. This respiratory activation enhances functional capacities of respiratory patients, promotes a return to daily life, regulates risk factors of cardiopulmonary diseases, and reduces the death rate and the incidence rate.⁶

Cardiopulmonary physical therapy can be conducted when patients and families understand diseases fully, and suitable treatment methods and strategies are established and learned. Also, the efforts of physical therapists with insight into physical therapeutic approaches and support from the society and family are needed. Furthermore, clinical specialties should evaluate cardiopulmonary functions properly and seek appropriate therapeutic exercise methods when curing patients limited in doing long-term physical activities due to several medical problems.⁷

There is a need for cardiopulmonary rehabilitation and it requires attention, but there is still a shortage of pathophysiological awareness or data about cardiopulmonary diseases in the field, though it's been a long time since the term, cardiopulmonary physical therapy was created.⁸

Besides, research on and development of respiratory

rehabilitation is yet insufficient in Korea, while various programs and studies have been developed and performed in foreign countries.⁹ Although, a series of mechanical reports emphasizing the significance of respiratory diseases has promoted active studies since the late 1990,¹⁰ yet, there are few researches on awareness or attitudes of physical therapists who are closely associated with cardiopulmonary physical therapy. Therefore, this study aims to examine awareness of physical therapists about cardiopulmonary physical therapy and use behaviors, in relation to the roles of physical therapists.

II. Methods

1. Subjects and Periods

In this study, structured questionnaires were distributed to 158(10%) randomly selected physical therapists working in general hospitals, hospitals, oriental medicine hospitals and clinics in Cheonnam Province(total 1580). Then, data were collected for 180 days from July to December 2013.

2. Measurement methods

1) Instrument and Measurement

As a research tool, a questionnaire based on literature review^{11,12} was employed. The researcher visited in the hospitals situated in Cheonnam Province in person to explain the purpose and contents of research to the subjects and asked them to fill out the self-administered questionnaires. After that, they were collected again.

The questionnaire consisted of a total of 18 questions; 9 questions about gender, age, levels of education, career, places of employment, work departments, marriage status and religion which are related to general characteristics, and 3 questions about experience in cardiopulmonary physical therapy intervention, knowledge acquisition routes and the necessity for it linked to awareness about cardiopulmonary physical therapy, and 3 questions about the interest in cardiopulmonary physical therapy, motives for becoming interested in cardiopulmonary physical therapy^{11,12}(Cronbach's $\alpha=.803$), and opinions about the necessity for future clinical education, and 3 questions about the implementation of

cardiopulmonary physical therapy and responses of patients,

2) Data Analysis

After gathering the questionnaires, except for those with unfaithful responses, descriptive statistics and frequency analysis of total 112 materials were conducted using the Window SPSS 17.0 program.

Table 1. Characteristics of subject

Division		n=112	%
Gender	Male	46	41.1
	Female	66	59.9
Age	Under the 4's	14	12.5
	Above 25's ~ under the 29's	58	51.8
	Above 30's ~ under the 34's	28	25
	Above 35's ~ under the 39's	4	7.1
Education	Above 40's	2	3.6
	Diplome(three year)	90	80.4
	Bachelor	16	14.3
	Master	6	5.3
Clinical career	Under the career of 1 year	2	1.8
	Above 1 year ~ under the 3 years	40	35.7
	Above 3 years ~ under the 5 years	50	44.6
	Above 5 year ~ under the 10 years	16	14.3
Workplace	above 10 years	4	3.6
	University, General Hospital	8	7.1
	Hospital	32	28.6
Department	Clinic	72	64.3
	Rehabilitation Medicine	12	10.7
	Orthopedics	48	42.9
	Neurosurgery	24	21.4
Marital Status	Internal Treatment	28	25
	Single	76	67.9
Religion	Married	36	32.1
	Christianity	26	23.2
	Roman Catholicism	6	5.4
	Buddhism	2	1.8
	Others	78	69.6

descriptive statistics

Table 2. Recognition of Therapeutic Interventions of Cardiopulmonary Physical Therapy

	n=112	%
Recognition of Therapeutic Interventions of Cardiopulmonary Physical Therapy		
Strongly agree	8	7.1
Agree	20	17.9
Disagree	64	57.1
Strongly disagree	20	17.9
Knowledge Acquisition Path of Cardiopulmonary Physical Therapy		
School Curriculum	68	60.7
Rekated Association seminar	8	7.1
Media	0	0
Books	10	8.9
Others	26	23.3
Cardiopulmonary Physical Therapy Necessary of mediation		
Strongly necessary	2	1.8
Necessary	44	39.3
Neutral	52	46.4
Unnecessary	14	12.5
Strongly unnecessary	0	0

III. Results

1. General characteristics of research subjects

In this research, there were 46 males and 66 females, and 14 subjects were below 24 years, 58 were 25 to 29 years old, 28 were 30 to 34 years old, 4 were 35 to 39 years old, and 2 were above 40 years. 90 of the subjects had a professional degree, 16 had a bachelor's degree, and 6 had a post-graduate degree, 2 subjects had less than a year of work experience, 40 had less than 1 to 3 years of experience, 50 had less than 3 to 5 years of experience, 16 had less than 5 to 10 years of experience, and 4 had over 10 years of experience. 8 subjects were working in general hospitals, 32 were working in hospitals, and 72 were working in clinics. 12 out of them were working in the department of rehabilitation medicine, 48 were working in the department of orthopedic surgery, 24 were working in the department of neurosurgery, and 28

were working in the department of internal medicine, 36 ones were married, and 75 were unmarried. In addition, 26 were Christians, 6 were Catholics, 2 were Buddhists, and 78 were believing in other religions (Table 1).

2. Physical therapists' awareness about cardiopulmonary physical therapy intervention

7.1% of the respondents knew about therapeutic intervention of cardiopulmonary physical therapy very well, 17.9% of them were aware of it, 57.1% of them were unaware of it, and 17.9% of them didn't know about it, at all. This means that physical therapists' awareness about cardiopulmonary physical therapy was very low, on the whole.

Also, 60.7% of them acquired knowledge about cardiopulmonary physical therapy from school curriculums, 7.1% of them acquired knowledge from related association seminars, 8.9% of them acquired knowledge from books, and 23.3% acquired knowledge from other routes. Lastly, 1.8% of the subjects replied the therapeutic intervention of cardiopulmonary physical therapy was really necessary, 39.9% of them felt the necessity, although they didn't think it was really necessary, 46.4% of them responded it was somewhat necessary, and 12.5% of them didn't feel the necessity (Table 2).

3. Interest in cardiopulmonary physical therapy

3.6% of the physical therapists were very interested in cardiopulmonary physical therapy, 28.6% of them were interested in it a bit, 35.7% of them felt common interest in it, and 32.1% were not interested in it. In terms of the motives for becoming interested in cardiopulmonary physical therapy, 33.3% of them answered that it was because it was really necessary for cardiopulmonary patients, 38.1% of them answered it was because there was a narrow scope of application, compared to the effect of cardiopulmonary physical therapy, 14.3% of them answered it was because they were aware of the therapeutic intervention effect of cardiopulmonary physical therapy, and 14.3% of them answered it was because they were interested in the therapeutic intervention of cardiopulmonary physical therapy.

But when the subjects were asked why they were not interested in cardiopulmonary physical therapy, 27.8% of

Table 3. Interest in Cardiopulmonary Physical Therapy

	n	%
Interest in Cardiopulmonary Physical Therapy		
Strong interest	4	3.6
Interest	32	28.6
Neutral	40	35.7
Not interested	36	32.1
School Curriculum	68	60.7
Why are you interested in Cardiopulmonary Physical Therapy		
Because I think it is essential to patients with diseases.	34	33.3
Because I think it has a small range of clinical applications, compared to the effect.	36	38.1
Because I know the effects of therapeutic interventions.	16	14.3
Because I have an interest in therapeutic interventions.	16	14.3
Others	0	0
What are you not interested in cardiopulmonary physical therapy.		
I think it is essential to patients with diseases.	31	27.8
I think it has a small range of clinical applications, compared to the effect.	3	2.8
I know the effects of therapeutic interventions.	26	22.2
I have an interest in therapeutic interventions.	52	47.2
Others	0	0

Table 4. Enforce Cardiopulmonary Physical Therapy

	n	%
Whether the working hospital should enforce Cardiopulmonary Physical Therapy or not		
Yes	2	1.8
No	110	98.2
Whether to apply Cardiopulmonary Physical Therapy directly or not		
Often apply	0	0
Apply	2	1.8
Neutral	0	0
Not apply	6	5.4
Non	104	92.9

them replied it was because they didn't feel the necessity of it for patients with cardiopulmonary and respiratory diseases, 2.8% of them replied it was because it was hard to apply to clinical treatment, in comparison to the effect, 22.2% replied it was because they didn't know well about the therapeutic intervention of cardiopulmonary physical therapy, and 47.2% replied that it was because they were not interested in its therapeutic intervention. Overall, physical therapists' interest in cardiopulmonary physical therapy was low (Table 3).

4. Implementation of cardiopulmonary physical therapy

When they were asked if physical therapy rooms were implementing cardiopulmonary physical therapy clinically, 1.8% of the subjects answered 'Yes', whereas 98.2% of them answered 'No'. Also, 1.8% of them responded they were applying the therapeutic intervention of cardiopulmonary physical therapy to patients a little, 5.4% of them replied they had hardly applied it, and 92.9% of them replied they had never applied it. This demonstrates there is an urgent need to implement cardiopulmonary physical therapy. In addition, only one of them responded that patients were satisfied with cardiopulmonary physical therapy, since there was a small number of subjects (Table 4).

IV. Discussion

Korean physical therapy has achieved a considerable development in the clinical field being applied to treatment, based on the scientific theories regarding human body. This is a result of physical therapy for improving the quality of lives of patients, and is anticipated to develop more than now, as people's interest and demand for physical therapy is expanding. Nevertheless, physical therapists' awareness about cardiopulmonary physical therapy is still lower than those in foreign countries.

60.7% of the physical therapists responded they didn't know well about the therapeutic intervention of cardiopulmonary physical therapy, and 23.2% of them responded they never knew about it, which means physical therapists' awareness about cardiopulmonary physical therapy was very low, overall. The largest number of physical therapists acquired

knowledge from school curriculums, and answered that the therapeutic intervention was necessary. In the U.S., there are total 8 domains of physical therapy acknowledged by the U.S. Physical Therapy Association (musculoskeletal physical therapy, nervous system physical therapy, physical therapy of the elderly, physical therapy for young children, clinical electrophysiology, sports physical therapy, and women's health physical therapy), and many physical therapists are being cultivated in the clinical area.¹³ Even in Australia, a lot of physical therapists are working in 8 domains of physical therapy, as well (cardiopulmonary physical therapy, musculoskeletal physical therapy, nervous system physical therapy, physical therapy for the elderly, women's health physical therapy, occupational health physical therapy, physical therapy for young children, and sports physical therapy).¹⁴ As above, professional activities are being done in each field, and especially, cardiopulmonary physical therapy is already necessarily recommended for various diseases, and many programs and studies on cardiopulmonary rehabilitation are being developed and conducted.¹⁵ But in Korea, there is a deficiency of activities and studies and this is associated with physical therapists' low perception, though the department of cardiopulmonary physical therapy has been opened in some professional fields. As revealed in this study, generally, physical therapists were aware of the necessity for the therapeutic intervention of cardiopulmonary physical therapy, but it is still depending on school curriculums and no therapeutic intervention has yet been applied to clinical treatment. This is because in school curriculums, students are more interested in electrotherapy and phototherapy, and musculoskeletal and nervous system physical therapy,¹⁶ and schools only stick to repeated contents about cardiopulmonary physical therapy rather than in-depth studies on it. In addition, students are confused between theories and practice, there is an absence of diverse approaches, and they only acquire fragmentary knowledge, and lack abilities to integrate knowledge.¹⁷ Overseas countries have subdivided the fields of physical therapy and schools are offering systematic learning, based on the clinical application of diverse theories and scientific grounds. In particular, there is a definite difference in clinical practice. In Australia, students must complete

nearly 700-hour practice(13 to 25 weeks), as they put stress on clinical practice-based learning.¹⁸ On the contrary, the regulations on clinical practice are different from 320 hours(8 weeks) to 640 hours(16 weeks) in Korean curriculums, but there is a big difference in clinical practice hours from 10% to 90%,¹⁹ and the courses for clinical practice in a school curriculum are not well organized, compared to foreign countries. In fact, it is realistically hard to set up plans for scholastic academic exchange with advanced schools in foreign countries and mutual development, due to the absence of systematic and in-depth research courses, and the differences in clinical practice hours, and the curriculums that are insufficient to apply the theories to treatment.¹⁶ Accordingly, for improving awareness about cardiopulmonary physical therapy, schools need to develop curriculums to offer cardiopulmonary physical therapy intervention to patients with various diseases through systematic learning.

When the subjects were given a question about the interest in cardiopulmonary physical therapy, many of them responded that the scope of application was narrow, compared to the effect, and the largest number of them responded they didn't feel the necessity of cardiopulmonary physical therapy for patients with cardiopulmonary diseases. When they were asked if the present physical therapy rooms were providing cardiopulmonary physical therapy, also, the majority of them said it was not applied, and many physical therapists responded that they had no experience in applying the therapeutic intervention directly. As a result, physical therapists' interest in cardiopulmonary physical therapy and the necessity perceived by them were highly low. In the field of nursing, there is active research on cardiopulmonary functions recently, compared to the field of physical therapy, and an effective respiratory rehabilitation treatment which helps in relieving symptoms of patients and improving physical functions, is widely recommended, because the therapeutic intervention cannot completely restore cardiopulmonary functions to normal conditions. Also, a respiratory rehabilitation program for enhancing self-efficacy is under development, as a plan to help respiratory rehabilitation continuously, aware of the need for this.²⁰ Physical therapists also should evaluate the suitability of

cardiopulmonary physical therapy and find proper therapeutic exercise programs for patients with chronic patients who are limited in doing long-term physical activities due to a lot of medical problems,²¹ and furthermore try to help to improve functions of patients with pulmonary diseases by using a respiratory exercise intervention technique in a proper way.

The therapeutic intervention in respiratory physical therapy began to develop by effort to get over the functional reduction of chronic obstructive pulmonary disease(COPD) patients, and its positive effect on other chronic pulmonary diseases like interstitial disease, cysticfibrosis, bronchiectasis, and thoracic cage abnormalities has been proven. It's been revealed that this therapeutic intervention is even effective for patients who underwent surgical operations such as lung transplantation or lung volume re-reduction surgery.^{20,22} Moreover, in cardiopulmonary physical therapy for patients with stroke in the central nervous system, aerobic exercise, aquatic exercise, ergometer of the upper and lower limbs and walking exercise are recommended to improve cardiopulmonary functions,²³ the necessity of cardiopulmonary physical therapy is stressed to for patients with acute and chronic back pain in the musculoskeletal system, since their physical activities shrink to ease pain, and this declines the opportunity of deep breathing, thoracic mobility, and deep trunk and abdominal muscles.²⁴ As explained above, cardiopulmonary physical therapy has a lot of intervention effects on different diseases, but the necessity of cardiopulmonary physical therapy is less perceived and it is really less implemented, while there is a high interest in and a high need for musculoskeletal physical therapy, nervous system physical therapy, and physical therapy for young children in Korea.²⁵

The necessity of physical therapists for cardiopulmonary physical therapy is being emphasized, whereas its application as a physical therapy intervention is greatly insufficient. Therefore, physical therapists and clinicians will have to be constantly interested in cardiopulmonary physical therapy and try to find effective application methods of cardiopulmonary physical therapy, verify the effect clinically, and conduct active studies.

But it is hard to broadly interpret that these results coincide with views of all the physical therapists, as this study was

only targeted at some areas in Cheonnam Province. Plus, this study failed to extract specific points, because domestic researches are absent, and there was no enough discussion with other studies.

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