

Characteristics of musculoskeletal disorders and satisfaction with in-house physical therapy clinics in office workers

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Abstract.

BACKGROUND: Musculoskeletal disorders are not properly managed in office workers because of their busy work life. In-house physical therapy is a good way to manage the musculoskeletal disorders in office workers. Despite the numerous advantages of in-house physical therapy, the establishment and research of in-house physical therapy were insufficient.

OBJECTIVE: The purpose this study was to determine the characteristics of musculoskeletal disorders in office workers and to investigate their satisfaction with in-house physical therapy clinics and the associated factors.

METHODS: In this study, 664 office workers who used in-house physical therapy clinics were surveyed for characteristics of musculoskeletal disorders and satisfaction with in-house physical therapy clinics.

RESULTS: Of these office workers, the most common causes of damage were nontraumatic (36.8%) and the most common lesion sites were the neck (30.3%) and lower back (25.6%). In the empirical characteristics of in-house physical therapy clinics, basic thermoelectric treatments were the most common (46.8%). The satisfaction with in-house physical therapy clinic was generally high. In addition, the cause of damage and treatment contents affected treatment-related and functional return-related satisfaction.

CONCLUSION: In-house physical therapy, including therapeutic exercises and self-management education, is a good system to manage musculoskeletal disorders in office workers.

Keywords: Musculoskeletal diseases, personal satisfaction, return to work, health care surveys, health maintenance organization

1. Introduction

The use of computers in the work environment among office workers has progressively increased in recent years [1], dramatically improving productivity. However, office workers have an increased risk for various chronic diseases because of their stationary and low-activity work and excessive computer use [2, 3]. In addition, musculoskeletal

disorders, including damage to the tendons, muscles, and nerves, are among the most common disorders associated with computer work environment [4, 5]. Prolonged static sitting posture and repetitive task are two causes of musculoskeletal disorders among office workers [6, 7]. In particular, office workers who use computers for prolonged periods develop dull pain in their neck, shoulders, and upper back [8–13].

Chronic musculoskeletal disorders develop because of improper management of acute musculoskeletal disorders and are associated with decreased functioning and quality of life, increased sick leave application, and increased medical care costs [14]. However, musculoskeletal disorders are not properly managed in office workers owing to the difficulty in availing of medical services from an external hospital because of a busy work life. Realistic methods for managing musculoskeletal disorders in office workers are needed. In the work environment, in-house physical therapy clinics allow less work hours to be lost, as they are located at a short distance and significantly decrease sick leave application and medical care costs [15]. Therefore, in-house physical therapy is important in managing musculoskeletal disorders in office workers.

An in-house physical therapy clinic is different from an external local physical therapy clinic because it is a facility for the welfare of office workers alone. Workers using in-house physical therapy clinic do not pay. Therefore, in-house physical therapy clinic can focus more on improving the rehabilitation of workers. However, most of external local physical therapy clinic are not free from economic profit. Despite the numerous advantages of in-house physical therapy, the establishment and research of in-house physical therapy were insufficient. To effectively manage musculoskeletal disorders in office workers, research on in-house physical therapy clinics is needed.

Therefore, this study aimed to determine the characteristics of musculoskeletal disorders in office workers who used in-house physical therapy clinics and to investigate their satisfaction with these clinics and the associated factors.

2. Methods

In this study, 664 office workers who used in-house physical therapy clinics from October 16, 2017 to November 17, 2017 were surveyed. Participants who used in-house physical therapy clinics were recruited from several companies in 10 regions of Korea. To investigate the characteristics of musculoskeletal disorders in office workers, sex, age, lesion site, cause of damage, and treatment contents were examined.

With respect to areas affected by musculoskeletal disorders in office workers, the lesion sites were the neck, upper back, lower back, shoulder, elbow, wrist,

knee, and ankle. The cause of damage was classified as traumatic, nontraumatic, and work-related.

With respect to treatment contents, in-house physical therapy received by the office workers was divided into basic thermoelectric treatments, therapeutic exercises, and self-management education. The basic thermoelectric treatments included interferential current therapy, microwave therapy, ultrasound therapy, and cervical and lumbar traction therapy to decrease pain intensity and facilitate the healing process. The therapeutic exercises included stretching exercises, strengthening exercises, and proprioceptive training to increase the functional capacity of office workers. Self-management education included home exercise program and postural re-education.

To investigate satisfaction with in-house physical therapy clinics, we developed a questionnaire based on the questionnaire developed by Goldstein, Elliott (16) and comprises 11 domains and 20 items. Each item was measured using a 5-point Likert scale, ranging from “strongly disagree” to “strongly agree.” In this study, the items related to available parking, reasonable cost, and accuracy of bills were removed because they were not associated with in-house physical therapy clinics. Moreover, we added new items related to return to work, return to activities of daily living, and the environment of in-house physical therapy clinics. The questionnaire on satisfaction with in-house physical therapy clinics used in this study comprised 3 domains and 13 items. The reliability of the questionnaire used in this study was high at 0.902 (Cronbach’s alpha based on standardized items).

Descriptive statistics were used to summarize the characteristics of the office workers. Satisfaction with in-house physical therapy clinics was measured as mean and standard deviation. The relationship between general characteristics and satisfaction with in-house physical therapy clinics was analyzed using analysis of variance, with significance level set at $\alpha < 0.05$. Stepwise multiple regression analysis was performed to assess factors affecting satisfaction with in-house physical therapy clinics. SPSS version 18.0 for Windows was used in all analyses, and P values < 0.05 were regarded as significant.

3. Results

A total of 664 office workers were surveyed in this study. However, we excluded 106 survey data because of unfaithful response. Finally, we analyzed the data for 581 office workers in this study. The

Table 1
Characteristics of office worker

Variables	N	(%)
Sex		
Male	405	69.7
Female	176	30.3
Age		
Less than 20	3	0.5
20 ~ 29	72	12.4
30 ~ 39	266	45.8
40 ~ 49	213	36.7
More than 50	27	4.6
Cause damage		
Traumatic	183	31.5
Nontraumatic	214	36.8
Work-related	184	31.7
Lesion site		
Neck	176	30.3
Upper back	20	3.4
Low back	149	25.6
shoulder	57	9.8
Elbow	30	5.2
Wrist	52	9.0
Knee	40	6.9
Ankle	52	9.0
Etc.	5	0.9
Treatment duration		
Less than 1 week	188	32.4
1 week ~ less than 1 month	148	25.5
1 month ~ less than 3 months	131	22.5
3 months ~ less than 12 months	85	14.6
More than 12 months	29	5.0
Treatments		
Modalities	272	46.8
Modalities + education	112	19.3
Modalities + exercises	100	17.2
Modalities + exercises + education	97	16.7

general characteristics of these 581 office workers who used in-house physical therapy clinics are shown in Table 1. Of these office workers, 69.7% were men and 30.3% were women; most office workers were aged 30–39 years (45.8%), followed by those aged 40–49 years (36.7%). Regarding the cause of damage, nontraumatic causes were the most common (36.8%), although the frequency of traumatic and work-related causes was not low (31.5% and 31.7%, respectively). The most common lesion sites were the neck (30.3%) and lower back (25.6%). The empirical characteristics of in-house physical therapy clinics are shown in Table 1. The most common treatment duration was less than 1 week (32.4%), and basic thermoelectric treatments were the most common modality (46.8%).

The satisfaction with in-house physical therapy clinic was generally high, as shown in Table 2. The item related to the courteousness of the physiotherapist had the highest score, whereas the item related to treatment schedule had a relatively low score com-

Table 2
Satisfaction of in-house physical therapy

No	Question item	Mean (SD)
1	My privacy was respected during my physiotherapy care	4.70 (0.49)
2	My physiotherapist was courteous	4.76 (0.46)
3	The clinic scheduled appointments at convenient times	4.28 (0.82)
4	The location of the facility was convenient for me	4.33 (0.75)
5	The physiotherapy clinic was convenient space(interior, layout, mood etc) to receive treatment	4.35 (0.71)
6	I was satisfied with the treatment provided by my physiotherapist	4.65 (0.51)
7	My physiotherapist understood my problem or condition	4.61 (0.54)
8	The instructions my physiotherapist gave me were helpful	4.61 (0.55)
9	I would recommend this physiotherapy clinic to colleague of my company	4.63 (0.53)
10	I would return to this physiotherapy clinic if I required physiotherapy care in the future	4.68 (0.52)
11	The physiotherapy what I received is helpful to return to my work	4.57 (0.58)
12	The physiotherapy what I received is helpful to return to my activity daily living	4.58 (0.54)

Table 3
Factor analysis of satisfactions of in-house physical therapy

Question No	Communalities	Component (factors)		
		1	2	3
2	0.731	0.836	0.013	0.179
1	0.707	0.816	0.056	0.197
7	0.627	0.645	0.408	0.212
6	0.652	0.642	0.341	0.352
9	0.622	0.632	0.440	0.172
8	0.611	0.630	0.395	0.243
10	0.520	0.606	0.357	0.157
11	0.825	0.146	0.882	0.162
12	0.819	0.279	0.838	0.198
4	0.756	0.103	0.187	0.843
5	0.727	0.241	0.139	0.806
3	0.477	0.307	0.120	0.607
Eigen value		5.823	1.143	1.109
Variance		48.523	9.524	9.243
Cumulative		48.523	58.047	67.289

Extraction Method: Principle Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

pared to other items. In addition, the results of the factor analysis of the satisfaction with in-house physical therapy clinics are shown in Table 3. Based on the results of the factor analysis using stepwise multiple regression analysis, items regarding satisfaction with in-house physical therapy clinic were classified into as treatment-related (items 2, 1, 7, 6, 9, 8, and 10),

functional return-related (items 11, 12), and treatment environment-related (items 4, 5, 3). Since all of the eigen values exceeded 1, and the commonality also exceeded 0.4, it was valid as a factor.

The general characteristics of office workers affecting satisfaction with in-house physical therapy clinic are shown in Table 4. Treatment duration and lesion site did not affect the satisfaction of office workers with in-house physical therapy clinics. However, the cause of damage and treatment contents affected treatment-related satisfaction. Treatment contents also affected functional return-related satisfaction. In the analysis of factors affecting satisfaction, work-related causes of damage affected treatment-related satisfaction. In addition, treatment contents including basic thermoelectric treatments, therapeutic exercises, and self-management education affected both treatment-related and functional return-related satisfaction.

4. Discussion

The use of in-house physical therapy clinics can be an effective way to manage musculoskeletal disorders

in busy office workers [15]. However, research on in-house physical therapy clinics is lacking. This study aimed to determine the characteristics of musculoskeletal disorders in office workers who used in-house physical therapy clinics and to investigate their satisfaction with in-house physical therapy clinics and the factors affecting it.

With respect to general characteristics, office workers aged 30–40 years and male office workers were more likely to use in-house physical therapy clinics. This study result could be attributed to the relatively large number of male office workers aged 30–40 years in the Korean industrial environment. With respect to the cause of damage, nontraumatic causes were the most common, although the frequency of traumatic and work-related causes of damage was not low (31.5% and 31.7%, respectively). Previous studies have shown that musculoskeletal disorders were common among office workers [17–19]. However, the results of this study indicated that there were various causes of damage associated with musculoskeletal disorders in office workers. Therefore, it is important to consider the cause of damage when treating musculoskeletal disorders in office workers. With respect to the lesion

Table 4
Factors affecting the satisfaction with in-house physical therapy

	N	Treatment-sat		Function-sat		Environment-sat		
		Mean (SD)		Mean (SD)		Mean (SD)		
Treatment duration	Less than 1 week	188	4.65	(0.41)	4.55	(0.54)	4.31	(0.59)
	1 week ~ 1 month	148	4.71	(0.35)	4.6	(0.52)	4.30	(0.62)
	1 month ~ 3 months	131	4.68	(0.41)	4.61	(0.49)	4.32	(0.66)
	3 months ~ 1 year	85	4.60	(0.47)	4.51	(0.56)	4.36	(0.6)
	More than 1 year	29	4.70	(0.35)	4.60	(0.49)	4.49	(0.45)
	<i>p</i> -vale		0.315		0.596		0.521	
Lesion site	Neck	176	4.68	(0.39)	4.56	(0.52)	4.33	(0.63)
	Upper back	20	4.75	(0.45)	4.78	(0.41)	4.33	(0.67)
	Lower back	149	4.66	(0.37)	4.56	(0.48)	4.28	(0.63)
	Shoulder	57	4.74	(0.38)	4.59	(0.58)	4.35	(0.54)
	Elbow	30	4.49	(0.56)	4.63	(0.59)	4.21	(0.70)
	Wrist	52	4.71	(0.35)	4.63	(0.51)	4.4	(0.59)
	Knee	40	4.67	(0.38)	4.55	(0.63)	4.41	(0.50)
	Ankle	52	4.59	(0.47)	4.52	(0.50)	4.30	(0.61)
	Etc.	5	4.43	(0.49)	4.40	(0.55)	4.20	(0.18)
	<i>p</i> -vale		0.099		0.720		0.884	
Injury reason	traumatic	214	4.64(a)	(0.42)	4.54	(0.53)	4.28	(0.62)
	Non-traumatic	183	4.64(a)	(0.43)	4.56	(0.56)	4.32	(0.59)
	Work related	184	4.73(b)	(0.35)	4.63	(0.48)	4.38	(0.62)
	<i>p</i> -vale		0.044		0.262		0.267	
Treatment contents	Modality	272	4.62(a)	(0.42)	4.52(a)	(0.55)	4.26	(0.64)
	Modality, Exercises	100	4.66(a,b)	(0.42)	4.53(a,b)	(0.54)	4.33	(0.60)
	Modality, Education	112	4.70(a,b)	(0.39)	4.62(a,b)	(0.48)	4.35	(0.57)
	Modality, Exercises, Education	97	4.76(b)	(0.31)	4.71(b)	(0.46)	4.45	(0.58)
	<i>p</i> -vale		0.024		0.013		0.052	

Treatment-sat: treatment related satisfaction, Function-sat: functional related satisfaction, Environment-sat: environmental related satisfaction.

site, we found that most office workers had pain in the neck and lower back. Similar to those of a previous study, the results of this study indicated that the neck and lower back were the most frequently reported lesion sites in office workers [20]. The pain in the neck and lower back in office workers could be due to their static sitting posture with prolonged computer use [21, 22]. Further, the results of this study indicated that in-house physical therapy clinics require health care programs related to the neck and lower back for office workers aged 30–40 years.

The results of this study indicated that the satisfaction of office workers with in-house physical therapy clinics was significantly high, which is consistent with those of previous studies investigating patient satisfaction with musculoskeletal physical therapy care [23]. Patient satisfaction is an important indicator of the quality of patient care [24, 25]. Therefore, a high level of patient satisfaction among office workers reflects good quality in-house physical therapy for managing musculoskeletal disorders in office workers. Among the items evaluating satisfaction, the score for the item related to treatment schedule (i.e., item 3) was relatively low compared to that for other items. The results of this study indirectly showed that Korean office workers are relatively sensitive about working hours and treatment schedule.

The results of this study indicated that treatment time and waiting time affect satisfaction with physical therapy, which is consistent with the results of previous studies [23]. Therefore, when operating an in-house physical therapy clinic in the workplace, the manager of in-house physical therapy clinic should fully consider the working hours and treatment schedule.

In this study, we classified satisfaction with in-house physical therapy clinics as treatment-, functional return-, and treatment environment-related, and investigated the factors affecting it. Work-related causes of damage affected treatment-related satisfaction. It is important to identify the cause of damage when treating office workers in the in-house physical therapy clinic. If the in-house physical therapy clinic can't cure all of the musculoskeletal injured workers, it is necessary to selectively treat work-related injured workers. In addition, treatment contents including therapeutic exercises and self-management education affected both treatment-related and functional return-related satisfaction. However, no factors of office worker using in-house physical therapy clinic associated with treatment environment-related satisfaction. These results suggest that office workers consider

treatment contents more important than treatment environment. Therefore, when operating an in-house physical therapy clinics, treatment contents should be given priority over the treatment environment. In a previous study on the satisfaction of patients with back pain, patients were more satisfied with the treatment when they performed therapeutic exercises than when they received massage or modality therapy [26, 27]. In another previous study, patient education was associated with higher patient satisfaction with physical therapy [28]. Moreover, in a study on chronic musculoskeletal disorders in workers, self-management was shown to help workers to return to their work [29]. So, when treating office worker in in-house physical therapy clinic, treatment contents including therapeutic exercise and self-management education are important to raise their treatment related satisfaction and return them to work.

4.1. *Limitations*

A limitation of this study was that only surveys that relied on the subjective evaluation of office workers were conducted. To improve the understanding of the effects of in-house physical therapy, further studies that objectively evaluate office workers are required.

5. **Conclusion**

Based on the results of this study, to improve the satisfaction with in-house physical therapy, therapeutic exercises and self-management education related to musculoskeletal disorders are needed when treating work-related injuries in office workers. In addition, to improve the functional return-related satisfaction of office workers, therapeutic exercises and self-management education should be included in in-house physical therapy. Overall, the high satisfaction with in-house physical therapy clinics, including treatment- and functional return-related satisfaction, indicates that an in-house physical therapy clinic is a good system to manage musculoskeletal disorders in workers, although this study was limited to office workers. This study aimed to determine the characteristics of musculoskeletal disorders in office workers and to investigate satisfaction with in-house physical therapy and the factors affecting it. The results of this study are expected to be used as basic data for the operation of in-house physical therapy clinics and the management of musculoskeletal disorders in office workers.

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Conflict of interest

The author has no conflict of interest to report.

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