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Survey Study in Prevalence Rate of Low Back Pain and Use of Complementary Alternative Medicine Care in Office Workers in Japan

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Abstract

This study conducted a questionnaire survey with 396 workers to investigate the work characteristics of low back pain workers and their subjective symptoms related to musculoskeletal disorders in each body region. And the survey was analyzed statistically.

As a result, among the work characteristics of workers with the low back pain, a work period (p<0.01) and work hours (p<0.05) had something to do with the low back pain. Sitting posture at work (p<0.001) and repeated movement at work (p<0.001) influenced the low back pain. Out of the patients with spinal disorders, 99.5% experienced the low back pain and recognized that the main cause of the pain was wrong posture (p<0.001). The surgical operation rate was very low (p<0.05), and the largest number of respondents not only went to clinics and hospital, but used alternative therapy when the low back pain occurred (p<0.05). The low back pain after treatments was alleviated (p<0.05), and the satisfaction with the treatment effects was high (p<0.05).

With regard to subjective symptoms of musculoskeletal disorders in other body regions than in the low back, the largest number of respondents had subjective symptoms in the neck and the shoulders. And the correlations between subjective symptoms of musculoskeletal disorders in the low back and in the shoulders (p<0.001), and in the neck (p<0.001) were the highest.

Key Words: Workers, Spinal Diseases, Low Back Pain, Complementary Therapy, Subjective Symptoms of Musculoskeletal Disorders

I. Introduction

1. Research Purpose and Necessity

With the economic and industrial development in society, machine-centric labor hours of workers have fallen more than in the past. However, since large manufacturing facilities and machines, and complicated and diverse processes are based on large-scale production, it is not fair to say that the work load of the human body has decreased a lot.

In other words, work-related accidents which inevitably occur in the industrial development has not decreased, but remain still. That seems to have the close relationship with the working conditions to which workers are exposed. In this sense, it is urgently needed to find the factors influencing industrial accidents and come up with measures to prevent and control them. Unfortunately, neither are such measures prepared relatively enough, nor safety and health care are managed properly, and thus work loss and economic loss incur (Ahn et al., 2011; Kang, 2011).

Because of workers' working posture and cumulatively repeated work, work-related musculoskeletal disorders have drawn a lot of attention. As a result, Occupational Safety and Health Act was amended in 2013.

Workers' constant heavy workload has led them to having more musculoskeletal symptoms and disorders related to their work. In Korea, musculoskeletal disorders of workers are on the rise and emerge as a critical social issue.

A ‘musculoskeletal disorder’ is a disease which occurs in nerves, muscles, and tendons, and their neighboring tissues of the neck, the shoulders, the arms, the elbows, the wrists, and the hands as a result of mechanical stress of simple and repeated work. It is not limited to work types which require long repeated and continuous motions or

postures (notification of the Ministry of Labor, 2000) and specific work types, but is found in most work places.

Work-related musculoskeletal disorders are caused by various risk factors, which are classified into work factor, personal factor, and psychosocial factor, among which work factor is reportedly the most risk one.

In particular, although the low back pain is sometimes involved in work-related musculoskeletal disorders of industrial accidents in terms of evaluation, it is independently evaluated without the involvement.

Chronic occupational low back pain induced by working long for one job, which is attributable to work absence and industrial accidents, takes longer time to treat than the low back pain caused in daily life, featuring a high recurrence rate (Schneider et al, 2006).

The pain in the low back occurs when vertebrae, disks and their neighboring fail to control each other spatially or have functional problems. Reportedly, 60-90% of all populations in the world suffer the low back pain in their whole life. Also, it is known that work-related low back pain accounts for about 20-30% of all industrial accidents, is the most critical culprit of labor loss (Hur et al., 2005; Oh et al., 2011). The low back pain is one of diseases occurring frequently in human beings, and its main cause has something to do with humans' upright walk. In fact, the spinal and pelvic structures of human beings are developed enough to endure dynamic burdens. However, thanks to work types and rising work intensity induced by the changing social structure and economic development, industrial accidents are on the increase.

It has been reported that 70-80% of the global population experience the low back pain at least once in their life and that 80-90% of workers suffer the pain in their low pack. Once the low back pain becomes chronic, it is hard to cure it and it is frequent to recur after temporary improvement (Troupetal, 1981; Mun et al., 1990).

Most domestic studies on patients with the low back pain related to musculoskeletal

disorders focus on the actual conditions and rehabilitation of the patients. There is no research on a comprehensive care plan for such patients.

Therefore, this research tried to investigate the labor conditions of the patients with the work-related low back pain, a method of alleviating the pain, and the relationship of the pain to other body regions, and thereby to provide a plan of caring for such patients and a fundamental material for a constant prevention program.

II. Theoretical Background

1. Work-related Low Back Pain

The low back pain is not a specific term of one disease, but widely represents a lumbar pain symptom. Usually, it is a pain in the lumbar ranging from the second lumbar vertebra to sacroiliac joint. Since most weight bearing takes place in the region, much damage and entailing various diseases occur. Also the lumbar is one of the body regions with the highest pain occurrence rate (Seok, 1992; Yoo et al., 1997)

Among the body regions in the general category of work-related cumulative trauma disorder, the low back has the highest pain occurrence rate. Also the low back pain causes delay or loss of returning to work, and thus leads into a social issue. For the reason, it is often explained in the different category of other musculoskeletal disorders.

Work-related low back pain requires more time to treat than other general types of low back pain, and its recurrence rate reaches 60% of all industrial accidents. Therefore, long-term recuperation and the difficulty with return to work result in a great deal of economic loss (Hur et al., 2005; Oh, 2011).

It has been known that work-related low back pain is caused not by single risk factor but by the interaction of diverse factors. With regard to gender, the backache rate of women is reported to be higher than that of men. Regarding personal factor, the backache rate of the middle-aged people is known to be high, and the relatively obese people and those doing exercise less are reported to have more backache (Choi et al., 1996; Schneider et al., 2006).

There are diverse and complicates causes of the low back pain. Therefore, the disorder should be looked into in various ways. Generally, the causes are classified into the structural factor caused by spinal lesion, into psychological factor by stress, and into

biomechanical factor by the lowering mechanical function of musculoskeletal system.

Among them, the pain caused by weakening soft tissues on the back, not by the structural factor around the back, account for 80%. Also, it occurs due to the diseases of the digestive system, the reproductive system, blood vessels, and the nervous system.

Those in a low social and economic level are more likely to be exposed to various risk factors and fail to receive proper treatment so that their backache rate is on the rise (Schneider et al., 2005).

The work of dealing with heavy goods or the repeated work using the upper limbs, improper work posture, and other ergonomic factors are known to influence the low back pain. In addition, some studies reported that psychosocial factors caused by work conditions or jobs, including stress and depression, and work schedule factors including work hours and work shift affect the low back pain (Wang et al., 2000; Hoogendoorn, 2002; Van, 2006).

2. Musculoskeletal Disorders

Musculoskeletal disorders generally mean the symptoms of discomfort, pain, and injury caused by damaged microfibrils including muscles, tendons, and ligaments around joints. The musculoskeletal disorders or the worsening symptoms caused by work are defined as work-related musculoskeletal disorders (WMSDs).

Other terms similarly used as musculoskeletal disorders are cumulative trauma disorders (CTDs), repeated strain damage, shoulder-arm syndrome, sprains, peritenonitis, and tennis elbow (Han, 2001; Bae, 2006).

International Labor Organization (ILO) mentioned work-related musculoskeletal disorders in workplace in the 1960s, and since 1980s, musculoskeletal disorders have occurred rapidly (OSHA, 1997; Kim & Gu, 2002).

In Korea, with the emergence of work-related musculoskeletal disorders in the late

1980s, research with telephone operators began to be conducted. Since then, research on musculoskeletal disorders has expanded to various kinds of occupation, including VDT workers, automobile assemblers, hair stylists, performers, and workers in packing department (Choi, 2005).

3. Complementary Therapy

Complementary therapy is defined differently depending on users. These days, it is generally termed Complementary and Alternative Medicine (CAM) (Joh, 2002). In the US, it is officially defined as ‘CAM’ which includes a wide range of therapeutic philosophies, approaches, and treatments, and generally medical colleges and hospitals do not accept it for education or use. Also, simply, complementary therapy can be explained as treatment or diagnosis act which is not supported by medical insurance, and is the area not covered by the western traditional medical science. In other words, it is a type of medical science not accepted by the orthodox medicine, and a sort of traditional medicine existing in each country and race.

In Korea, it has various names, such as alternative therapy, alternative medicine, complementary medicine, complementary alternative medicine, alternative complementary therapy, and complementary alternative therapy. In particular, the term 'therapy' is used so that it is considered to helping patients' health improvement and recovery, aside from doctors' treatment and diagnosis. Therefore, it is a type of treatment and therapy chosen by patients and their care givers (Lee, 1998). Because of the characteristics of alternative medicine, it has been developed in oriental medicine, and folk remedies have been handed down. These days, some domestic and foreign remedies have been used.

As such, alternative medicine has been used in a wide range of areas. Nevertheless, it has common beliefs and characteristics basically. In other words, the human body has its own healing ability, and proper stimuli facilitate the ability and sometimes strongly

influence the human body. Also alternative medicine is based on the health view that it has close relationship with physical, mental, and psychosocial health, life habits, and dietary habits. In particular, it emphasizes harmony and balance and uses the method of giving the least damage to the human body.

Since ‘Almaty Declaration' in 1978, more attention has been paid on complementary alternative therapy. In addition, in 1992 when alternative medicine research institute was established in the US, complementary alternative therapy began to be discussed in earnest. Center for Complementary and Alternative Medicine (NCCAM) established in 1992 under the US National Institutes of Health (NIH) has supported basic and applied research on complementary and alternative therapy and has provided relevant information to the public.

In addition, the Office of Cancer Complementary Alternative Medicine (OCCAM) was established in 1998 to expand and control the activities of National Cancer Institute (NCI).

In Korea, the health and medical care system has been established with oriental medical system based on traditional medicine and with the western medical system which has been developed with the introduction of modern western medicine in 1876 when the country was opened to the West. Therefore, the Korean health and medical care system is mainly made up of oriental and western medical areas which have met the public's medical needs. In addition, the country has a dualized medical system that legally guarantees both western medicine and oriental medicine. Therefore, when it comes to complementary alternative therapy, it is mainly referred to as other treatment methods than oriental medicine (Kim et al., 2000).

In Korea, most complementary alternative therapies are not new, but have existed to improve health thousands of years as part of cultural heritage which occurred from national tradition (Shin, 1999). Academic approaches of western medical scientists and health care researchers are still in initial stage. Complementary alternative therapy has

been ignored or despised on account of non-science often. Therefore, it is necessary to research complementary alternative therapy to suggest its effects and scientific grounds.

III. Research Method

1. Research Subjects

The study subjects were 420 patients with the low back pain, who went to a hospital located in 00, Japan. To find their work-related characteristics, their subjective symptoms of musculoskeletal disorders, and the relationship, this study had conducted a questionnaire survey from Feb. 15 to Apr. 1, 2014.

After listening to the purpose of this questionnaire and how to answer the questions, the survey participants replied in a self-administered way. Among the collected questionnaire copies, the copies with insincere answers and no answers were excluded. As a result, a total of 396 copies were used for the final analysis.

2. Questionnaire

The study subjects were Japanese. Therefore, the questionnaire was first written in Korean, and then was translated into Japanese.

The questionnaire is categorized into four parts: general characteristics; work characteristics; treatment, effect, and satisfaction; and subjective symptoms of musculoskeletal disorders.

The assessment method for subjective symptoms of musculoskeletal disorders was based on the questionnaire about symptoms of musculoskeletal disorders provided by Korea Occupational Safety and Health Agency. With the workers who have occupations chosen as the subjects of harmful factor survey, this study looked into their symptoms of musculoskeletal disorders and their subjective symptoms of pains in each body region. The survey was used to select work types or workers which have a high rate of

the symptoms.

The survey table of musculoskeletal disorders provided by Korea Occupational Safety and Health Agency was designed to assess six body regions: the neck, the shoulders, the arms/elbows, the hands/wrists/fingers, and the legs/feet. This study assessed the neck, the arms/elbows, the wrists/fingers, and the legs/ankles which have one-to-one correspondence with work posture assessment. The survey participants directly filled in the questionnaire of subjective symptoms.

Whether or not they have the symptoms related to musculoskeletal disorders was determined in accordance with the definition in the standard 1 of the National Institute for Occupational Safety and Health. In other words, among the questionnaire survey participants, those who answered that they had subjective symptoms lasting at least one week or had at least one symptom (pain, sore, stiffness, burning, numbness, or twinge) in joints of the upper limbs (the neck, the shoulders, the elbows, and the wrists) more than once a month over the last one year were defined as patients who have the symptoms of musculoskeletal disorders.

3. Statistical Analysis

The statistical analysis methods used in this study are presented as follows:

Frequency analysis with n and % was conducted to investigate the general characteristics of the study subjects and backache patients' subjective symptoms related to musculoskeletal disorders in other body regions. And cross tabulation analysis was conducted to look into the differences in work characteristics by occupations, the low back pain occurrence by occupations, the diagnosis and treatments of the low back pain by occupations, and the correlations between subjective symptoms of musculoskeletal disorders in the low back and in other body regions. To examine the satisfaction with the effects of the treatments on the low back pain, one-way ANOVA was conducted.

The statistics program used in this study was SPSS 18.0.

IV. Research Results

1. General Characteristics

The general characteristics of the study subjects are presented in Table 1. With regard to gender, 162 men (40.9%) and 234 women (59.1%) participated in the survey. Regarding age, participants aged less than numbered 62 (15.7%); those aged between 31 and 40 numbered 116 (29.3%); those aged between 41 and 50 numbered 134 (33.8%); and those aged over 51 numbered 84 (21.2%).

Regarding physical characteristics, in the case of height, 168 study subjects (42.4%) were less than 160cm, 148 (37.4%) were between 161cm and 170cm, and 80 (20.2%) were more than 171cm; in the case of weight, 88 study subjects (22.2%) were less than 50kg, 134 (33.8%) were between 51kg and 60kg, 106 (26.8%) were between 61kg and 70kg, 36 (9.1%) were between 71kg and 80kg, and 32 (8.1%$) were more than 81kg.

With regard to life habits, in the case of drinking, 234 study subjects had the habit of drinking (59.1%), and 162 (40.9%) didn't; in the case of smoking, 64 subjects (16.2%) had the habit of smoking, and 332 (83.8%) didn't; in the case of doing exercise, 36 subjects (9.1%) did exercise regularly on the basis of three times a week and 20 minutes a time, 148 (37.4%) did exercise irregular, 212 (53.5%) didn't, and thus more than 50% didn't do exercise.

Table 1. General Characteristics of the Study Subjects

General Characteristics			n	%
General Characteristics	Gender	Male	162	40.9
		Female	234	59.1
	Age	Less than 30	62	15.7
		Between 31 and 40	116	29.3
		Between 41 and 50	134	33.8

		More than 51	84	21.2
	Marriage	Unmarried	178	44.9
		Married	218	55.1
Physical Characteristics	Height	Less than 160cm	168	42.4
		Between 161cm and 170cm	148	37.4
		More than 171cm	80	20.2
	Weight	Less than 50kg	88	22.2
		Between 51kg and 60kg	134	33.8
		Between 61kg and 70kg	106	26.8
		Between 71kg and 80kg	36	9.1
		More than 81kg	32	8.1
Life Habits	Drinking	Yes	234	59.1
		No	162	40.9
	Smoking	Yes	64	16.2
		No	332	83.8
	Doing Exercise	Regular	36	9.1
		Irregular	148	37.4
		None	212	53.5
Total			396	100.0

2. The Differences in Work Characteristics by Occupations

The differences in work characteristics depending on the study subjects' occupations are presented in Table 2.

Regarding a work period, in the case of office work, 52 subjects (46.4%) were working more than 16 years; in the case of manufacturing work and sales work, 24 (37.5%) and 8 (33.3%), respectively, were working 1-6 years; in the case of technical and professional work, 52 (34.7%) were working more than 16 years. Therefore, there were different work periods depending on occupations (χ^2=33.271, p<0.01).

Regarding work hours, int he case of office work and manufacturing work, the most number of people were working 8 hours; in the case of sales work and technical and professional work, the largest number of people were working 9-10hours. Therefore, work hours were different depending on occupations (χ^2=19.461, p<0.05).

With regard to the posture in working, in the case of office work, 96 subjects (85.7%) took the posture of sitting; in the case of other work types, the largest number of respondents took the posture of standing. Therefore, working postures were different depending on occupations (χ^2=143.110, p<0.001). Regarding repeated movements in working, 54 subjects (84.4%) in the type of manufacturing work had repeated motions, and thus their repeated work performance ratio was higher than those in other work types (χ^2=39.764, p<0.001).

Table 2. The Differences in Work Characteristics by Occupations

Work Characteristics		Occupations					Total	χ^2
		Office Work	Manufacturing Work	Sales Work	Technical & Professional Work	Others		
Work Period	Less than 1 year	2 (1.8)	6(9.4)	2 (8.3)	6(4.0)	6 (13.0)	22 (5.6)	33.271**
	1-6 years	32 (28.6)	24(37.5)	8 (33.3)	38(25.3)	10 (21.7)	112 (28.3)	
	6-10 years	16 (14.3)	10(15.6)	4 (16.7)	22(14.7)	6 (13.0)	58 (14.6)	
	11-15 years	10 (8.9)	10(15.6)	6 (25.0)	32(21.3)	12 (26.1)	70 (17.7)	
	More than 16 years	52 (46.4)	14(21.9)	4 (16.7)	52(34.7)	12 (26.1)	134 (33.8)	
Work Hours	Less than 8 hours	58 (51.8)	36(56.3)	4 (16.7)	56(37.3)	20 (43.5)	174 (43.9)	19.461*
	9-10 hours	48 (42.9)	24(37.5)	16 (66.7)	74(49.3)	22 (47.8)	184 (46.5)	
	More than 11 hours	6 (5.4)	4(6.3)	4 (16.7)	20(13.3)	4 (8.7)	38 (9.6)	
Working Posture	Sitting	96 (85.7)	8(12.5)	4 (16.7)	46(30.7)	10 (21.7)	164 (41.4)	143.110***
	Standing	4 (3.6)	40(62.5)	10 (41.7)	62(41.3)	26 (56.5)	142 (35.9)	
	Sitting & Standng by Turns	12 (10.7)	16(25.0)	10 (41.7)	42(28.0)	10 (21.7)	90 (22.7)	

Movement	Repeated	52 (46.4)	54(84.4)	6 (25.0)	66(44.0)	20 (43.5)	198 (50.0)	39.764***
	Non-Repeated	60 (53.6)	10(15.6)	18 (75.0)	84(56.0)	26 (56.5)	198 (50.0)	
Total		112 (100.0)	64 (100.0)	24 (100.0)	150 (100.0)	46 (100.0)	396 (100.0)	

*p<0.05, **p<0.01, ***p<0.001.

3. The Low Back Pain Occurrence by Occupations

The low back pain occurrence by occupations is presented in Table 3. Regarding the experience of the low back pain, all respondents in the types of office work, sales work, and technical and professional work experienced the low back pain.; and 62 people (96.9%) in the type of manufacturing work had the experience. Therefore, workers experienced the low back pain regardless of occupations (χ^2=10.428, p<0.05).

With regard to the frequency of the low back pain suffering, 36 people (32.1%) in the type of office work suffered the low back pain almost every day; 18 people (28.1%) in the type of manufacturing work felt the pain once a week; 8 people (33.3%) in the type of sales work felt the pain almost everyday; 48 people (32.0%) in the type of technical and professional work suffered the pain once a week (χ^2=50.994, p<0.001). Regarding the time of the low back pain occurrence, in all work types the chronic, people had over one-year chronic backache more than less than three-month acute backache. However, there was no statistical difference (χ^2=2.749).

Regarding the questions of the cause of the low back pain, the largest answer in all work types was wrong posture, and the next largest ones were repeated physical movement, and fatigue and stress (χ^2=85.002, p<0.001).

Table 3. The Low Back Pain Occurrence by Occupations

Occurrence State		Occupations					Total	χ^2
		Office Work	Manufacturing Work	Sales Work	Technical and Professional Work	Others		
Low Back Pain	Yes	112 (100.0)	62(96.9)	24 (100.0)	150(100.0)	46 (100.0)	394 (99.5)	10.428*
	No	-	2(3.1)	-	-	-	2 (.5)	
The Frequency of Pain Occurrence	Almost Everyday	36 (32.1)	12(18.8)	8 (33.3)	28(18.7)	16 (34.8)	100 (25.3)	50.994***
	Once/3 days	24 (21.4)	10(15.6)	4 (16.7)	26(17.3)	10 (21.7)	74 (18.7)	
	Once/1 week	14 (12.5)	18(28.1)	-	48(32.0)	8 (17.4)	88 (22.2)	
	Once/1 month	20 (17.9)	12(18.8)	2 (8.3)	18(12.0)	-	52 (13.1)	
	Once/3 months	8 (7.1)	10(15.6)	8 (33.3)	18(12.0)	8 (17.4)	52 (13.1)	
	Others	10 (8.9)	2(3.1)	2 (8.3)	12(8.0)	4 (8.7)	30 (7.6)	
Type of Low Back Pain Occurrence	Acute (Less than 3 months)	14 (12.7)	12(19.4)	4 (16.7)	28(19.2)	10 (21.7)	68 (17.5)	2.749
	Chronic	96 (87.3)	50(80.6)	20 (83.3)	118(80.8)	36 (78.3)	320 (82.5)	
Cause of the Low Back Pain	Wrong Posture	38 (33.9)	34(53.1)	16 (66.7)	72(48.0)	10 (21.7)	170 (42.9)	85.002***
	Repeated Physical Movement	4 (3.6)	14(21.9)	2 (8.3)	12(8.0)	-	32 (8.1)	
	Fatigue & Stress	34 (30.4)	4(6.3)	6 (25.0)	22(14.7)	16 (34.8)	82 (20.7)	
	Lumbar Sprain	8 (7.1)	2(3.1)	-	6(4.0)	-	16 (4.0)	
	Repeated Posture	18 (16.1)	8(12.5)	-	28(18.7)	8 (17.4)	62 (15.7)	
	Others	10 (8.9)	2(3.1)	-	10(6.7)	12 (26.1)	34 (8.6)	
Total		112 (100.0)	64(100.0)	24 (100.0)	150(100.0)	46 (100.0)	396 (100.0)	

* $p<0.05$, *** $p<0.001$.

4. The Diagnosis and Treatments of the Low Back Pain by Occupations

The diagnosis and treatments of the low back pain by occupations are presented in Table 4. Regarding the diagnosis with herniated intervertebral disc disease,

48 people (42.9%) in the type of office work, 36 (56.3%) in the type of manufacturing work, 12 (50.0%) in the type of sales work, and 54 (36.0%) in the type of technical and professional work were diagnosed with the disease. Although those in the manufacturing and sales work types had the disease more than in other work types, there was no statistical difference (χ^2=8.450).

Regarding a surgical operation, 2 office workers (1.8%) and 4 manufacturing workers (6.3%) had a surgical operation. Therefore, there was a difference depending on occupations (χ^2=13.055, p<0.05). Regarding the question about the treatments of the low back pain, the largest answers were going to clinics and hospital and using alternative therapy in the case of office work; going to clinics and hospital, using alternative therapy, and both going to hospital and using alternative therapy in the case of manufacturing work; bearing the pain in the case of sales work; and going to clinics and hospital in the case of technical and professional work. Therefore, there were different treatments depending on occupations (χ^2=55.631, p<0.001).

Table 4. The Diagnosis and Treatments of the Low Back Pain by Occupations

Evaluation & Treatments		Occupations					Total	χ^2
		Office Work	Manufacturing Work	Sales Work	Technical and Professional Work	Others		
Whether to be Diagnosed	Yes	48 (42.9)	36(56.3)	12 (50.0)	54(36.0)	22 (47.8)	172 (43.4)	8.450
	No	64 (57.1)	28(43.8)	12 (50.0)	96(64.0)	24 (52.2)	224 (56.6)	
Whether to have Surgical Operation	Yes	2 (1.8)	4(6.3)	-	-	-	6 (1.5)	13.055*
	No	110 (98.2)	60(93.8)	24 (100.0)	150(100.0)	46 (100.0)	390 (98.5)	
Treatments	Going to	26	16(25.0)	6	50(33.3)	16	114	55.631***

Clinics and Hospital	(23.2)		(25.0)		(34.8)	(28.8)
Going to Oriental Medicine	8 (7.1)	12(18.8)	2 (8.3)	36(24.0)	8 (17.4)	66 (16.7)
Using Alternative Therapy	34 (30.4)	16(25.0)	2 (8.3)	24(16.0)	16 (34.8)	92 (23.2)
Going to Hospital and Using Alternative Therapy	20 (17.9)	16(25.0)	6 (25.0)	16(10.7)	2 (4.3)	60 (15.2)
Bearing the Pain	18 (16.1)	4(6.3)	8 (33.3)	20(13.3)	4 (8.7)	54 (13.6)
Others	6 (5.4)	-	-	4(2.7)	-	10 (2.5)
Total	112 (100.0)	64(100.0)	24 (100.0)	150(100.0)	46 (100.0)	396 (100.0)

$^{*}p<0.05$, $^{***}p<0.001$.

5. The Effects of the Treatments on the Low Back Pain and the Satisfaction with the Treatment Effects by Occupations

The effects of the treatments on the low back pain by occupations are presented in Table 5. The largest number of respondents said that their pain was alleviated. Eight manufacturing workers (13.3%) and two sales workers (12.5%) were cured. Therefore, the effects of the treatments were different depending on occupations (χ^2=28.895, $p<0.05$).

The satisfaction with the treatment effects by occupations is presented in Table 6. the occupations that showed the highest satisfaction degree were manufacturing work (3.93±1.103) and office work (3.89±.988). Therefore, there was statistically significant differences depending on occupations (F=3.187, $p<0.05$).

Table 5. The Effects of the Treatments on the Low Back pain by Occupations

Work Characteristics		Occupations					Total	X^2
		Office Work	Manufacturing Work	Sales Work	Technical and Professional Work	Others		
Effects	Pain Alleviation	60 (62.5)	34(56.7)	10 (62.5)	50(38.5)	18 (45.0)	172 (50.3)	28.895*
	Cure	4 (4.2)	8(13.3)	2 (12.5)	10(7.7)	4 (10.0)	28 (8.2)	
	So so	22 (22.9)	14(23.3)	4 (25.0)	48(36.9)	14 (35.0)	102 (29.8)	
	No Effects	6 (6.3)	2(3.3)	-	6(4.6)	-	14 (4.1)	
	Don't know	4 (4.2)	2(3.3)	-	16(12.3)	4 (10.0)	26 (7.6)	
Total		96 (100.0)	60(100.0)	16 (100.0)	130(100.0)	40 (100.0)	342 (100.0)	

* $p<0.05$.

Table 6. The Satisfaction with the Treatment Effects by Occupations

Occupation	N	Mean±SD	F
Office Work	88	3.89±.988	3.187*
Manufacturing Work	60	3.93±1.103	
Sales Work	16	3.50±1.033	
Technical and Professional Work	116	3.47±1.075	
Others	42	3.52±1.153	
Total	322	3.68±1.080	

* $p<0.05$.

6. The Low Back Pain Patients' Subjective Symptoms Related to Musculoskeletal Disorders in Other Body Regions

The study subjects' subjective symptoms related to musculoskeletal disorders in other body regions are presented in Table 7. 120 subjects (30.3%) had subjective symptoms in the neck; 154 (38.9%) in the shoulders; 48 (12.1%) in the arms; 44 (11.1%) in the

wrists; 58 (14.6%) in the knees; 56 (14.1%) in the legs. The largest number of the study subjects had subjective symptoms in the neck and the shoulders.

Table 7. The Low Back Patients' Subjective Symptoms Related to Musculoskeletal Disorders in Other Body Regions

Subjective Symptoms Related to Musculoskeletal Disorders		n	%
Neck	Those without Symptoms	276	69.7
	Those with Symptoms	120	30.3
Shoulders	Those without Symptoms	242	61.1
	Those with Symptoms	154	38.9
Arms	Those without Symptoms	348	87.9
	Those with Symptoms	48	12.1
Wrists	Those without Symptoms	352	88.9
	Those with Symptoms	44	11.1
Knees	Those without Symptoms	338	85.4
	Those with Symptoms	58	14.6
Legs	Those without Symptoms	340	85.9
	Those with Symptoms	56	14.1
Total		396	100.0

7. The Correlations between Subjective Symptoms of Musculoskeletal Disorders in the Low Back and in Other Body Regions

The correlations between subjective symptoms of musculoskeletal disorders in the low back and in other body regions are presented in Table 8. 84 subjects (60.9%) had the correlation between their subjective symptoms in the low back and in the neck (χ^2=93.702, p<0.001); 102 (73.9%) had the correlation between their subjective symptoms in the low back and in the shoulders (χ^2=109.331, p<0.001); 34 (24.6%) had the correlation between their subjective symptoms in the low back and in the arms (χ^2=31.152, p<0.001); 28 (20.3%) had the correlation between their subjective symptoms in the low back and in the writs (χ^2=18.068, p<0.001); 44 (31.9%) had the correlation

between their subjective symptoms in the low back and in the knees (χ^2=50.345, p<0.001); 44 (31.9%) had the correlation between their subjective symptoms in the low back and in the legs (χ^2=54.318, p<0.001). Therefore, there were correlations between the subjective symptoms of musculoskeletal disorders in the low back, and in the shoulders and the neck.

Table 8. The Correlations between Subjective Symptoms of Musculoskeletal Disorders in the Low Back and in Other Body Regions

Subjective Symptoms Related to Musculoskeletal Disorders		The Low Back		Total	χ^2
		Those without Symptoms	Those with Symptoms		
Neck	Those without Symptoms	222(86.0)	54(39.1)	276(69.7)	93.702***
	Those with Symptoms	36(14.0)	84(60.9)	120(30.3)	
Shoulders	Those without Symptoms	206(79.8)	36(26.1)	242(61.1)	109.331***
	Those with Symptoms	52(20.2)	102(73.9)	154(38.9)	
Arms	Those without Symptoms	244(94.6)	104(75.4)	348(87.9)	31.152***
	Those with Symptoms	14(5.4)	34(24.6)	48(12.1)	
Wrists	Those without Symptoms	242(93.8)	110(79.7)	352(88.9)	18.068***
	Those with Symptoms	16(6.2)	28(20.3)	44(11.1)	
Knees	Those without Symptoms	244(94.6)	94(68.1)	338(85.4)	50.345***
	Those with Symptoms	14(5.4)	44(31.9)	58(14.6)	
Legs	Those without Symptoms	246(95.3)	94(68.1)	340(85.9)	54.918***
	Those with Symptoms	12(4.7)	44(31.9)	56(14.1)	
Total		258(100.0)	138(100.0)	396(100.0)	

*** p<0.001.

V. Discussion

In 2003 when the domestic law related to musculoskeletal disorders was established, the care for workers suffering musculoskeletal disorders began in earnest. Musculoskeletal disorders have something to do with work, and occur in any body regions. In particular, given that the low back pain can be chronic, it is very important to care for those who have subjective symptoms of musculoskeletal disorders.

As of 2006, the patients with the work-related low back pain accounted for 57.9% of all musculoskeletal disorder patients. Among the acts that cause work-related low back pain, lifting up and down, piling up, and moving heavy goods accounted for 64.0%. Also 75.2% of work-related low back pain accidents were caused by lifting up and down, pushing and pulling, and other acts requiring much muscular power.

According to the study results, there were differences in the low back pain of workers depending on occupations. Especially, workers with over 16 years of work career and those with less than 5 years of work career had the low back pain more than others. According to the study by Kim et al., (2007), 30.3% of all work-related low back pain patients had less than six months of work career, and 38.2% of non-work related low back pain patients and 37.6% of those who had physical word load had 10-20 years of work career. Therefore, workers with long career years had more musculoskeletal disorders, and thus work career was found to have something to do with the low back pain.

Gwon (2011) studied the causes of the low back pain. According to the study, the acute low back pain was relatively mostly attributable to trauma, herniated intervertebral disc disease, myofascial low back pain, and facet syndrome, and the chronic low back pain was to herniated intervertebral disc disease, spondylosis deformans, spondylolisthesis, osteoporosis, myofascial low back pain, and posture-induced low back

pain. Similar to the result of the study by Gwon, this study revealed that study subjects had more chronic low back pain than acute low back pain, and that they recognized that the main cause of their low back pain was wrong posture.

Most domestic studies on the actual conditions of low back pain patients and complementary alternative therapies focused on perception and opinions. Although there was research on the use of alternative therapy with chronic low back pain patients (Ha & Huh, 2008), no research has been made on the use of complementary alternative therapy for work-related low back pain.

According to this study result, 99.5% of patients with spinal diseases suffered the low back pain. Among them, 23.2% used alternative therapy only; 15.2% not only went to clinics and hospital, but also used alternative therapy. Such a result was different from the results of other relevant studies: according to Yang & Im (2003), 66.7% of chronic low back pain patients experienced alternative therapy; Lee (2001) reported that 77.5% of patients with rheumatoid arthritis experienced alternative therapy; Lee & Park (1999) showed that 51.2% of patients with various chronic pains experienced complementary therapy.

This study revealed that the pain alleviation after complementary therapy and the satisfaction with the therapy were high. Likewise, the study by Yang & Im (2003) also showed that the effect of alternative therapy reached 81.0% and thus patients' satisfaction with complementary therapy was high.

Many studies on musculoskeletal disorders classified subjective symptoms related to musculoskeletal disorders by body regions. However, there is no research on the musculoskeletal disorder body regions related to the low back pain. According to this study on the correlation between low back pain workers' subjective symptoms of musculoskeletal disorders in the low back and in other body regions, there were high correlations with the shoulders and the neck.

It means that body region musculoskeletal disorders are highly related to other body

regions, and that it is necessary to find the characteristics of the whole body, not one body region, to care for pains, and thereby to establish a plan to prevent musculoskeletal disorders.

This study was conducted with Japanese people to whom complementary therapy was more popularized than to Korean people. To care for workers suffering musculoskeletal disorders as well as the low back pain, it is required to come up with a diversified care program. It is expected that comparative research will be made with Korean workers suffering the low back pain.

VI. Conclusion

This study conducted a questionnaire survey with 396 workers to investigate the work characteristics of low back pain workers and their subjective symptoms related to musculoskeletal disorders in each body region. It came to the following conclusion:

1. With regard to the work characteristics of the workers with the low back pain, in the case of a work period, 46.4% of office workers, and technical and professional workers with the low back pain were working 16 years; and the largest number of manufacturing workers and sales workers were working 1-6 years. Therefore, there was a difference depending on occupations. In the case of work hours, the largest number of office workers and manufacturing workers were working less than 8 hours; and the largest number of sales workers and professional workers were working 9-10 hours. Therefore, there was a difference depending on occupations. Regarding the working posture, 85.7% of office workers had the posture of sitting, and workers with other occupations had the posture of standing. Regarding the repeated work movement, 84.4% of manufacturing workers had repeated work, and thus they were more exposed to repeated posture than those in other work types.
2. With regard to the low back pain experience of the study subjects, 99.5% experienced the low back pain. Regarding the frequency of the low back pain occurrence, 32.1% of office workers said that they felt the pain almost everyday. Regarding the time of the low back pain occurrence, in all work types, the more than one-year chronic low back pain was found more than the less than 3-month acute low back pain was. With respect to the cause of the low back pain, the main cause was found to be wrong posture.
3. Regarding diagnosis with herniated intervertebral disc disease, 56.3% of manufacturing

workers and 50.0% of sales workers were diagnosed with the disease. However, the surgical operation rate was low. With regard to the treatments of the low back pain, the largest number of the study subjects not only went to clinics and hospital, but also used alternative therapy. Also, the largest number of respondents replied that their pain was alleviated after the treatments. Manufacturing workers and office workers were most satisfied with the treatment effects.

4. Regarding subjective symptoms of musculoskeletal disorders in other body regions than the low back, the neck was found most, followed by the shoulders, the arms, the wrists, the knees, and the legs in order. Those who had subjective symptoms in the neck and the shoulders were found most.
5. The correlation between subjective symptoms of musculoskeletal disorders in the low back and in the neck was 60.9%; the correlation between the subjective symptoms in the low back and in the shoulders was 73.9%; the correlation between the subjective symptoms in the low back and in the arms was 24.6%l the correlation between the subjective symptoms in the low back and in the wrists was 20.3 %; the correlation between the subjective symptoms in the low back and in the knees was 31.9%; and the correlation between the subjective symptoms in the low back and in the legs was 31.9%. Therefore, there were correlations between the subjective symptoms of musculoskeletal disorders in the low back and in the shoulders, and in the neck.

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국문초록

본 연구는 허리 통증 경험이 직장인의 업무 관련 특성 및 신체 부위별 근골격계질환 관련 자각증상과의 관련성을 파악하기 위하여 396명을 대상으로 설문 조사 실시 통계 분석하였다.

그 결과 허리 통증 직장인의 업무 특성 중 근무 기간 ($p<0.01$)과 근무 시간 ($p<0.05$)이 허리 통증 과 관련성이 있는 것으로 파악되었으며, 근무 시 앉아서 이루어지는 자세 ($p<0.001$), 반복적인 움직임 ($p<0.001$) 이 허리 통증에 영향을 미치는 것으로 나타났다. 척추 질환자 중 허리 통증 경험자는 99.5%로 바르지 못한 자세가 주요 원인이라 인식하는 것으로 나타났다 ($p<0.001$). 허리 통증으로 인한 수술 경험은 매우 낮았으며 ($p<0.05$), 허리 통증 발생 시 의원 및 병원 방문과 대체요법 이용이 가장 많은 것으로 나타났다 (p,0.05). 대처 방법에 따른 통증 효과는 감소를 경험한 것으로 나타났으며 ($p<0.05$), 통증 효과에 대한 만족도는 높은 것으로 나타났다 ($p<0.05$).

신체부위 허리를 제외한 신체 부위의 근골격계질환 자각증상은 신체 부위 목과 어깨의 자각증상자가 가장 많았으며, 신체부위 허리의 근골격계질환 관련 자각증상은 신체부위 어깨 ($p<0.001$)와 목 ($p<0.001$)과 관련성이 가장 높은 것으로 나타났다.

Key Words: 직장인, 척추 질환, 요통, 보완요법, 근골격계질환 관련 자각증상

Appendix

Questionnaire	ID				

Dear participants,

The purpose of this questionnaire is to look into the actual conditions of workers' low back pain and any replacement therapies, and provide a fundamental material for low back pain control.

This questionnaire may take some time. Please answer sincerely. This questionnaire survey is used only for statistics and guarantees your privacy. Please fill in the questionnaire honestly.

Thank you.

Jan. 2013

Ⅰ. Information on respondent

1. What is your gender? 1) Male 2) Female

2. How old are you? ( ) years of age

3. Height: (cm), Weight: (kg)

4. Are you married or unmarried?

1) unmarried (e.g., divorce, bereavement) 2) married

5. Do you drink? 1) Yes 2) No

6. Do you smoke? 1) Yes 2) No

7. Do you do exercise?

1) I do regularly(more than three times a week; more than 20 minutes each time).

2) I do irregularly.

3) I don't.

II. Frequency of low back pain occurrence & How to handle

1. What is your work type?

1) Office work 2) Manufacturing work 3) Sales work

4) Technical work 5) Others ( )

2. How many years have you been working in your current field?

1) Less than 1 year 2) 1-5 years 3) 6-10 years

4) 11-15 years 5) Over 16 years

3. How many hours do you work every day on average?

1) Less than 8 hours 2) 9-10 hours 3) Over 11 hours

4. What is the posture you usually take at work?

1) Sitting 2) Standing 3) Sitting & Standing by turns

5. Is your body movement repeated at work?

1) Yes, it is. 2) No, it isn't.

6. Have you ever felt any pain in your low back over the last one year?

1) Yes 2) No(*In the case of 'No', go to section III. to answer the questions.)

7. How often do you feel pain?

1) Almost every day 2) Once every three days 3) Once a week

4) Once a month 5) Once every three months

6) Others( )

8. Since how long ago have you been suffering low back pain?

1) Acute(less than 3 months ago) 2) Chronic(months/ years ago)

9. What do you think causes the pain?

1) Wrong posture 2) Repeated body movement 3) Fatigue and stress

4) Lumbar sprain 5) Long sitting or standing 6) Disease

7) Others ( )

10. Have you ever been diagnosed with herniated intervertebral disc disease?

1) Yes 2) No

10-1. If you say 'Yes' to the above question, did you have any relevant operation?

1) Yes(months/ years ago) 2) No

11. How do you handle the pain in the low back?

1) Go to hospital or clinic 2) Go to oriental medical clinic

3) Use replacement therapy. 4) Go to hospital and use replacement therapy

5) Bear the pain 6) Others( )

12. After having the treatment you chosen in the above question 11, what was the effect?

1) Reduced pain 2) Cured 3) Not good effect

4) No effect 5) More pain 6) Don't know.

13. How much are you satisfied with the treatment method?

1) Very satisfied 2) Somewhat satisfied

3) Neither satisfied Nor dissatisfied 4) Somewhat dissatisfied

5) Very dissatisfied

14. Subjective symptoms of pain in the low back pain and other body regions (the body regions

in which you have felt pain only in a year)

Body Regions	Neck	Shoulders	Waist	Arms /Elbows	Wrists /Fingers	Knees	Legs /Ankles
1. Have you ever experienced pain, ache, numbing, stiffening, burning, or sensory paralysis?	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No
In the case of "Yes", answer the following questions.							
2. Which side is it?		①Left ②Right ③Both sides		①Left ②Right ③Both sides	①Left ②Right ③Both sides	①Left ②Right ③Both sides	①Left ②Right ③Both sides
3. How long have you been experiencing such symptoms?	[ ] months	[ ] months	[ ] months	[ ] months	[ ] months	[ ] months	[ ] months
4. How long do the symptoms last? ① 1 day or so ② 1 week or so ③ 1 week to 1 months ④ 1 month to 6 months ⑤ Over 6 months	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤
5. How often do the symptoms occur? ① Always ② Once a week ③ Once a month ④ Once every some months	① ② ③ ④	① ② ③ ④	① ② ③ ④	① ② ③ ④	① ② ③ ④	① ② ③ ④	① ② ③ ④
6. How severe are the symptoms? ① Never severe ② Little ③ Somewhat ④ Severe ⑤ Very severe	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤
7. Have you ever experienced the symptoms over the last week?	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No
8. Have you ever received treatment of the symptoms at hospital?	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No
9. If so, how long have you had the treatment?	[ ] days	[ ] days	[ ] days	[ ] days	[ ] days	[ ] days	[ ] days
10. Because of the symptoms, have you ever experienced department change or work rotation?	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No	①Yes ②No