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Work-related burn injuries and claims for post-traumatic stress disorder in Korea

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ABSTRACT

Objective: The objective of this study is to broaden our understanding of psychiatric disorders due to work-related burn injury compensated by the Industrial Accident Compensation Insurance operated by the Korea Workers' Compensation and Welfare Service (KCOMWEL). **Methods:** Using the KCOMWEL electronic database, we collected data on psychiatric disorders due to work-related burn injury based on workers' compensation records from 2005 to 2014 and analyzed the characteristics of the claims.

Results: The average number of claims per year for post-traumatic stress disorder was 67 and the approval rate from 2005 to 2014 was 53.6%. Regarding occupation, 63 workers were elementary workers involved in the performance of simple and routine tasks which may require the use of hand-held tools and considerable physical effort and 59 were electrical and electronic equipment fitters and repairers. Acute stress disorder, nonorganic insomnia, and sexual dysfunction were the most commonly approved psychiatric disorders associated with work-related burn injury, followed by mixed anxiety-depressive disorder.

Conclusions: We analyzed the characteristics of the psychiatric disorders due to work-related burn injury for which compensation was received from 2005 to 2014 according to the approved results. To gain a long-term understanding of the management of workers' compensation status for psychiatric disorders due to work-related burn injuries, we should gather accurate information on the risk factors involved in order to achieve the needed systematic improvements.

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1. Introduction

The treatment of psychiatric disorders due to work-related injury under the accident compensation scheme is an issue of

real importance, given the frequency of such claims. Several disasters may occur in the workplace, resulting in depressive disorder, post-traumatic stress disorder (PTSD), and panic disorder [1]. The most commonly observed disorders after

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traumatic injuries including burns are depression and PTSD [2,3]. Being a female, past psychiatric problems, the severity of the trauma, and poor support systems have been documented as risk factors for PTSD associated with work-related [4-6]. In patients with burns, high neuroticism indexes increase the risk of development of PTSD, whereas high levels of extroversion lower the risk of PTSD [7]. Previous studies indicated that survivors of work-related injuries suffered from higher rates of depressive disorder, anxiety disorder, and substance use disorders [8,9]. However, the studies addressing psychiatric problems after work-related injuries including burns were restricted by limited information about psychological assessment [10,11]. Survivors of work accidents not only subjectively suffered from pain, sleep-related symptoms, intrusive memories of the accident, memory impairment, anxiety, depression, and irritability but even more objectively fulfilled the diagnostic criteria for acute stress disorder or PTSD [12-16]. It has been demonstrated that 12-34.7% of injured workers met the criteria for PTSD and 11-18.2% had subclinical PTSD symptoms [10,17-19]. Prevalence of depression and PTSD at 1-year post-burn varies widely, from 13% to 65%, depending on the study methods used [20]. Work-related accidents can be sudden and life-threatening. After such accidents, workers show higher levels of depression and poorer coping skills than workers who have not experienced accidents; furthermore, the workers who have severe depression symptoms and poor coping skills may be vulnerable for the development and progression of PTSD [21-24]. Occupational accidents occasionally result in PTSD and thus a psychological evaluation and counseling should be initiated in the assessment of injured workers and workers at risk of injury [25].

The recognition process for all psychiatric disorders including PTSD is as follows. First, the Korea Workers' Compensation and Welfare Service (KCOMWEL) investigates into the diagnosis, working conditions, stress, symptoms and signs, and medical records, after which the Committee on Occupational Disease Judgement (CODJ) decides whether the disease is to be compensated by Industrial Accident Compensation Insurance (IACI) [26]. In 2013, the Ministry of Employment and Labor in Korea amended the IACI Act and added PTSD due to work-related psychological trauma [27]. Depressive episodes or adjustment disorders associated with work-related stress were added in 2016. The objective of this study is to broaden our understanding of psychiatric disorders due to work-related burn injury compensated by the IACI, operated by KCOMWEL.

2. Methods

We included all burn injury from 2005 to 2014 for which the final decisions were made by December 2014. The KCOMWEL provided all data for the claims, including work history, working conditions, various job stressors, diagnoses, medical records, official investigation results, and decision statements from the CODJ. Two psychiatric experts (B.C.L and K.S.L) in the field of trauma and occupational psychiatry reviewed all data and discussed the clinical implications. The study was approved by the Hangang Sacred Heart Hospital Institutional Review Board. (IRB No:2015-070)

3. Results

We identified 16,681 claims for work-related burn injuries and 3588 claims for psychiatric disorders due to work-related burn injuries (Table 1). Of the total claimed cases, men accounted for 60.7% ($n=10,132$) and women 39.1% ($n=6,549$). In the case of psychiatric disorders involved in claims for work-related burn injuries, men accounted for 81.3% ($n=2,918$) and women 18.7% ($n=670$). As for age, 40-49 was the most common age group in claims for psychiatric disorders due to work-related burn injuries. The approval rate for PTSD due to work-related burn injuries compensated by industrial accident insurance during the 10-year period was 52.7%, and the number of claims increased from 10 in 2005 to 133 in 2014 (Table 2). The most commonly claimed psychiatric disorder due to work-related burn injuries was PTSD (17.0%, $n=1,251$), followed by major depressive disorder unspecified (14.9%, $n=1,091$), major depressive disorder severe (9.3%, $n=681$), and adjustment disorders (9.1%, $n=671$). The approval rates for ASD, nonorganic insomnia, sexual dysfunction, mixed anxiety-depressive disorder, and adjustment disorders compensated by industrial accident insurance were relatively high (Table 3).

4. Discussion

As there was an increase in psychiatric disorders due to work-related burn injuries, claims of occupational psychiatric disorders associated with burn injuries also considerably increased during the 10-year period from 2005 to 2014. The

Table 1 – General characteristics of the work-related burn injuries in the claims database.

	Total	Men, work-related burn injuries	Women, work-related burn injuries	Men, psychiatric disorders	Women, psychiatric disorders
Age (years)					
<30		1583 (15.6%)	927 (14.2%)	193 (6.6%)	43 (6.4%)
30-39		2130 (21.0%)	446 (6.8%)	517 (17.7%)	48 (7.2%)
40-49		2426 (23.9%)	1180 (18.0%)	815 (27.9%)	91 (13.6%)
50-59		2530 (25.0%)	2664 (40.7%)	888 (30.4%)	317 (47.3%)
>60		1463 (14.4%)	1332 (20.3%)	505 (17.3%)	171 (25.5%)
Total	16,681 (100%) /3588 (100%)	10,132 (60.7%)	6549 (39.1%)	2918 (81.3%)	670 (18.7%)

Table 2 – Number of workers' compensation certifications and approval rates for post-traumatic stress disorder, by year.

	Final approval		Total
	Approval ^a	Disapproval	
2005	5 (50%)	5 (50%)	10 (1%)
2006	6 (50%)	6 (50%)	12 (1%)
2007	15 (50%)	15 (50%)	30 (2.6%)
2008	24 (50%)	24 (50%)	48 (4.1%)
2009	47 (50.5%)	46 (49.5%)	93 (8%)
2010	44 (51.8%)	41 (48.2%)	85 (7.3%)
2011	112 (50.5%)	110 (49.5%)	222 (19%)
2012	137 (51.3%)	130 (48.7%)	267 (22.9%)
2013	143 (53.8%)	123 (46.2%)	266 (22.8%)
2014	82 (61.7%)	51 (38.3%)	133 (11.4%)
Total	615 (52.7%)	551 (47.3%)	1166 (100%)

The Workers' Compensation and Welfare Service investigates into claims due to the PTSD associated with burn injury, after which the Committee on Occupational Disease Judgement decides whether the disease is to be compensated by Industrial Accident Compensation Insurance. The approval means that individual of PTSD associated with burn injury was compensated by industrial accident insurance.

^a Approval.

approval rate of all psychiatric diseases due to work-related burn injuries was approximately 53.6%. ASD, nonorganic insomnia, and sexual dysfunction were the most commonly approved psychiatric disorders, followed by mixed anxiety-depressive disorder and adjustment disorders, while approval rates were relatively low for panic disorder, mild cognitive disorder, organic personality disorder, and somatoform

disorders. It is conceivable that psychiatric diseases caused by external stress or trauma such as ASD and adjustment disorder are easily granted, but psychiatric diseases caused mainly by biological factors such as panic disorder is not granted.

Numerous studies have attempted to identify the characteristics of psychiatric disorders due to work-related injuries, using the KCOMWEL database [28–32]. In a study examining 3175 cases in which workers were compensated for psychiatric disorders, “personality and behavioral disorders due to brain disease, damage, and dysfunction,” “reactions to severe stress and adjustment disorders,” and “depressive episodes” were the leading causes of compensation, in that order [31]. In this study, workers aged from 30 to 49 years had the highest prevalence of psychiatric disorders due to work-related injuries. In 2008, the Occupational Safety and Health Research Institute of the Korea Occupational Safety and Health Agency reported 187 cases of work-related psychiatric disorders from 1999 to 2004 [28]. The most common psychiatric disorders due to work-related injuries were “reaction to severe stress and adjustment disorders,” followed by “depressive episodes” and “other anxiety disorders.” A recent study identified that claims due to psychiatric disorders increased during the 5-year period (2010–2014), mainly occurring after trauma, employment-related issues, legal problems, or workplace violence. The approval rate was approximately 33% [32]. According to several studies in Korea, although the numbers of compensated psychiatric disorders are likely to be lower-end estimates, they are still far from negligible [33].

Considering the fact that various benefits under the IACI Act are implemented as one of the nation's social insurance systems, it is almost impossible for a worker who is not a medical expert to discover that a work-related injury is the

Table 3 – Disease-specific approval rates for psychiatric disorders due to work-related burn injuries.

Diagnosis (duplicates were allowed)	Final approval		Total
	^a Approval	Disapproval	
Post-traumatic stress disorder	671 (53.6%)	580 (46.7%)	1251 (17.0%)
Adjustment disorder	597 (89.0%)	74 (11.0%)	671 (9.1%)
Acute stress reaction	522 (100%)	0 (0%)	522 (7.1%)
Major depressive disorder unspecified	564 (51.7%)	527 (48.3%)	1091 (14.9%)
Major depressive disorder severe	529 (77.7%)	172 (22.3%)	681 (9.3%)
Major depressive disorder mild	66 (11.3%)	520 (88.7%)	586 (8.0%)
Major depressive disorder moderate	286 (99.3%)	2 (0.7%)	288 (3.9%)
Organic mental disorder NOS	175 (43.5%)	227 (56.5%)	402 (5.5%)
Mild cognitive disorder	0 (0%)	520 (100%)	520 (7.1%)
Mixed anxiety depressive disorder	521 (99.8%)	1 (0.2%)	522 (7.1%)
Organic personality disorder	0 (0%)	174 (100%)	174 (2.4%)
Non-organic insomnia	173 (100%)	0 (0%)	173 (2.4%)
Sexual dysfunction	174 (100%)	0 (0%)	174 (2.4%)
Panic disorder	0 (0%)	172 (100%)	172 (2.4%)
Organic mood disorder	21 (28.4%)	53 (71.6%)	74 (1.0%)
Somatoform disorder	0 (0%)	21 (100%)	21 (0.3%)
Total	4299 (58.6%)	3043 (41.4%)	7342 (100%)

The Workers' Compensation and Welfare Service investigates into claims due to the PTSD associated with burn injury, after which the Committee on Occupational Disease Judgement decides whether the disease is to be compensated by Industrial Accident Compensation Insurance. The approval means that individual of PTSD associated with burn injury was compensated by industrial accident insurance.

^a Approval.

cause of a certain psychiatric disorder. It is necessary to improve the system to minimize workers' burdens in the course of reviewing whether or not their psychiatric disorders are industrial accidents. There is an increase in the recognition of psychiatric disorders due to industrial accidents by the Korea Labor Welfare Corporation and the courts, while the Ministry of Employment and Labor is making efforts to lower the threshold for recognizing industrial accidents. However, there are several reasons that explain the underdetection of psychiatric needs. First, most work-related burns are treated by burn specialist hospitals that lack psychiatrists, so many burn survivors think the psychiatric problems they are experiencing are part of the natural course of treatment and recovery. Moreover, workers need solid proof of psychiatric suffering to receive approval for treatment. This hesitation delays psychiatric engagement at an early stage of disease, which is an important intervention for trauma patients. Most of all, psychiatric disorders are still somewhat stigmatized in Korea. Only 22.2% of those with psychiatric disorders make use of psychiatric services, which is almost half the rate in the USA. Also, the actual situation is that institutional regulations are insufficient with respect to the judgment and approval of industrial accidents, which affects the recognition of a mental disorder as being due to an industrial accident. In the event that a mental disorder cannot be recognized as an industrial accident, there begins a vicious circle in which an afflicted worker does not apply for approval even when suffering from a mental disorder due to work. It is unreasonable to lay the burden of proof on workers because it is more difficult to determine the proximate causal relation of a mental disorder with work in comparison to physical diseases, and therefore it is necessary to change or more evenly distribute the burden of proof.

To our knowledge, this is the most recent study to describe the trends and issues related to psychiatric disorders due to work-related burn injuries among employees. We analyzed the characteristics of the claims for psychiatric disorders due to work-related burn injuries that were compensated from 2005 to 2014 according to the approved results. For the purpose of the long-term understanding and management of workers' compensation status for psychiatric disorders due to work-related burn injuries, we should gather accurate information on the risk factors involved in order to achieve the necessary systematic improvements. Although the number of work-related psychiatric disorders that receive compensation has increased, preventive efforts and much work remains to manage psychiatric disorders due to work-related injuries.

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Conflicts of interest

The authors declare that they have no conflict of interest.

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