

Occupational Psychiatric Disorders in Korea

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We searched databases and used various online resources to identify and systematically review all articles on occupational psychiatric disorders among Korean workers published in English and Korean before 2009. Three kinds of occupational psychiatric disorders were studied: disorders related to job stress and mental illness, psychiatric symptoms emerging in victims of industrial injuries, and occupational psychiatric disorders compensated by Industrial Accident Compensation Insurance (IACI). Korea does not maintain official statistical records for occupational psychiatric disorders, but several studies have estimated the number of occupational psychiatric disorders using the Korea Workers' Compensation and Welfare Service (COMWEL, formerly KLWC) database. The major compensated occupational psychiatric disorders in Korea were "personality and behavioral disorders due to brain disease, damage, and dysfunction", "other mental disorders due to brain damage and dysfunction and to physical diseases", "reactions to severe stress and adjustment disorders", and "depressive episodes". The most common work-related psychiatric disorders, excluding accidents, were "neurotic, stress-related, and somatoform disorders" followed by "mood disorders".

Key Words: Occupational Diseases; Mental Disorders; Work-related; Job Stress

INTRODUCTION

According to the 2006 Epidemiologic Survey on Psychiatric Illness (ESPR), 3.0% of the Korean adult population suffers from mood disorders; and the prevalence of somatoform disorders in Korea has increased, whereas that of other psychiatric disorders has decreased since the 2001 ESPR survey (1). Common mental disorders, particularly mood, neurotic, stress-related, and somatoform disorders, accounted for the vast majority of mental health-related work costs. The World Health Organization has predicted that depression will be the second largest cause of global health burden problems by 2020 (2). Indeed, depression is emerging as a widespread problem in the workplace and is related to a significant portion of the costs associated with lost labor hours and decreased productivity (3, 4). In recent years, work-related disability has come to include a rapidly increasing number of workers with psychiatric disorders. Additionally, Korea has also experienced an increase in the number of people requesting national workers' compensation care due to psychiatric diseases (5).

Occupational psychiatric disorders are defined as any psychiatric disorder resulting from employment. This broad definition includes occupational psychiatric injuries and occupational psychiatric diseases. An occupational psychiatric injury is any personal psychiatric injury or psychiatric disease resulting from an occupational accident. An occupational psychiatric injury is

therefore distinct from an occupational psychiatric disease, which is a psychiatric disease contracted as a result of exposure over a period of time to risk factors arising from work or occupational activity. Occupational psychiatric diseases are psychiatric illnesses associated with a particular occupation or industry. Such diseases result from a variety of biological, chemical, physical, and psychological factors that are present in the work environment or are otherwise encountered in the course of employment. Similarly, work-related psychiatric diseases are defined as those affecting a work-related population that are at least partially caused by work and/or aggravated, accelerated, or exacerbated by occupational exposure and/or cause impaired work capacity (6). Work-related psychiatric disorders do not develop along unique and specific etiological pathways, and these diseases are influenced not only by work-related issues, but also by physical illnesses and individual susceptibilities. However, an individual's background, personality, and health and job stress may be major factors in work-related psychiatric illnesses. Previous studies have documented a relationship between occupational stress and psychiatric disorders (7-9). Because psychiatric disorders arise from poor psychosocial work environments, special attention should be devoted to ensuring the proper management of stress. In the early 2000s, the Korean Occupational Stress Scale (KOSS) emerged in the context of increased research on job stress (10). According to Chang et al. (10), occupational stressors for Korean workers resemble characteristics found in

Western societies. However, “discomfort in the occupational climate” and “inadequate social support” seemed to be more important stressors for Korean than for Western workers.

As is the case in Japan (11), work-related mental illness has increased in Korea since 1997 due to the shaky employment market. Structural changes in the form of organizational downsizing and restructuring as well as the unstable labor market have increased job insecurity and created both physical and psychological stress among Korean employees (12, 13). After several patients who had been admitted to the hospital for occupational injuries committed suicide, work-related suicide became a social issue in Korea. Thus, in 2000, the Ministry of Employment and Labor of the Korean Government established suicide as a bona fide occupational injury and provided compensation to the surviving family members in accord with this status. Following the increased attention paid to those with psychosocial problems, new standards were introduced to decision-making processes about occupational compensation. From 1999 to 2004, 23 instances of suicide were defined by the Korea Workers’ Compensation and Welfare Service (COMWEL) as work-related injuries (14).

MATERIALS AND METHODS

The purpose of this article is to present an overview of occupational psychiatric disorders in Korea. Toward this end, all available relevant articles in Korean and English were retrieved using PubMed (<http://www.ncbi.nlm.nih.gov/sites/entrez?db=pubmed>) and KoreaMed (<http://koreamed.org/SearchBasic.php>). In addition, various online resources were accessed via internet search engines. We then reviewed all relevant papers and corresponding references published in Korean and English. Pertinent reports of occupational psychiatric disorders in Korea were also included in our analysis.

Mental health and psychological stress (job stress) among Korean employees

The National Institute for Occupational Safety and Health (NIOSH), part of the US Department of Health and Human Services, defines job stress as the harmful physical and emotional responses that occur when the requirements of jobs do not match the capabilities, resources, or needs of workers (15). Stress also occurs in situations with high demands that are largely or totally out of the control of the workers involved (16). Job stress can lead to poor health and injury.

Many Korean researchers have been interested in the relationship between health problems and job stress, but the resulting studies have primarily evaluated physical (i.e., cardiovascular and musculoskeletal diseases) rather than mental illnesses. Several studies have examined psychological problems (17-21), but most research has focused on those symptoms of distress

that can be evaluated with self-administered subjective instruments. Job stress may also play a significant role in the increased risk of depressive symptoms experienced by Korean employees. Consistent with previous studies in other countries (22), job insecurity and occupational climate, in particular, were highly associated with depressive symptoms (17, 19).

Kim et al. (21) compared the depressive symptoms experienced by Korean Industrial Service employees engaged in emotional labor with those of employees engaged in physical labor. Employees working in department stores, hotels, and family restaurants showed higher mean values for job satisfaction, job insecurity, and depressive symptoms. Additionally, high levels of job insecurity were related to increased depressive symptoms and, conversely, job satisfaction played a role in reducing depressive symptoms.

One study for workers at small and medium-sized companies in Korea demonstrated that the risk of self-reported occupational injury experience was higher in workers who reported depressive symptoms (23). In addition, concerns about job stress and interpersonal disputes have been increasing, and a case of mental illness caused by job stress following job reassignment was reported in Korea for the first time in 2003 (24). The worker in this case, who was sensitive to emotional stress, suffered from chronic stress symptoms after changing from a car mechanic to an office manager, a position that required continuous interaction with customers and a heavy emotional burden. Panic attacks and conversion symptoms were judged to be associated with incongruence between individual characteristics and environmental needs (24).

Mental health of Korean shift workers

It has been suggested that shift work increases the risk of sleep disturbances. Sleep impairment is common in mood disorders. Sleep problems, which can arise from pressure to sacrifice sleep to catch up with work, can lead to the exacerbation of mood disorders and/or emerge as a consequence of such disorders. The appropriate scheduling of sleep and activity also constitutes an essential contributor to both performance and well-being (25).

Several Korean researchers (26-28) evaluated the sleep patterns and daytime sleepiness of Korean nurses engaged in shift work. Kim et al. (26) concluded that nurses with rotating shifts had greater difficulties with sleep, including problems falling and staying asleep, showed decreased energy, and expressed less sense of well-being compared with daytime workers. Nurses performing rotating shift work experienced more severe daytime sleepiness than did controls. Hwang et al. (27) reported that shift-working female nurses had significantly longer sleep and re-sleep latencies, more days with insomnia, and greater likelihood of using drugs when experiencing sleep difficulties than did day-working pharmacists. And Lee et al. (28) reported

that a statistical difference between shift workers and non-shift workers, in terms of sleep initiation time.

A study on Korean shift workers employed in manufacturing plants investigated the effects of shift work (29) by distributing questionnaires on issues related to general health, insomnia, stress, quality of life, and psychological health to 850 shift workers (study group) and 550 non-shift workers. When adjusted for age, working period, education, and job satisfaction, the data showed that shift workers were more likely to complain of insomnia. Greater job satisfaction was coupled with fewer complaints of insomnia. Shift workers also experienced more stress than did non-shift workers in their daily lives, and decreased job satisfaction was associated with increased complaints of stress. The quality of life of shift workers was lower than that of non-shift workers, and shift-workers had more anxiety than did non-shift-workers.

Mental health and physical hazards

Physical work environment (light, temperature, noise, etc.) is also important to the mental health of workers. One study examined physical hazards related to mental health in Korea. Park and Lee (30) analyzed the relationship between noise exposure at a Korean worksite and workers' stress symptoms. They found that higher noise exposure at work (from 80 dB) was significantly related to more severe stress symptoms such as anxiety, anger, depression, and cognitive difficulties.

Mental health and chemical hazards

Acute or chronic exposure to certain chemicals leads to organic brain damage, with cognitive and behavioral impairment. Several Korean studies have evaluated the effects of lead, mercury, several heavy metals, carbon disulfide (CS₂), and other organic solvents. Most studies focused on lead and mercury entailed monitoring biological factors in the workplace and the physical health of workers. A few studies evaluated the mental effects of solvents (31-35) and heavy metals (manganese) (36, 37) using self-rating scales and neurobehavioral tests.

Park et al. (38) observed six viscose-rayon workers with long-standing exposure to CS₂. These individuals manifested neurological symptoms: headaches, dizziness, general malaise, gait difficulty, visual and memory disturbances, paresthesia of distal extremities, dementia, Parkinsonian features, pseudobulbar palsy, spastic gait, dysarthria, hyperreflexia, and reduced or absent ankle-jerk reflexes. Nerve conduction studies revealed that three patients suffered from polyneuropathy of the axonal type. Cho et al. (39) evaluated the long-term neuropsychological effects and magnetic resonance imaging (MRI) findings of retired workers with histories of exposure to CS₂. They found no statistically significant differences between high- and low-exposure groups in total, verbal, and performance IQ. MRI findings revealed that a significantly greater number of those in the high-

exposure group (five of 12 subjects) showed cerebral lacunae. Periventricular hyperintensities were located primarily in frontal and occipital areas, and white-matter hyperintensities were observed primarily in frontal and parietal areas.

Data also have indicated an association between 2-bromopropane and the development of serious toxicities (especially with respect to reproductive organs and bone marrow) in Korean workers. Choi et al. (40) reported that this solvent was also related to neuropsychiatric symptoms.

One study among dry-cleaning workers showed that fatigue, depression, and urinary disturbances were related to organic solvents (41). Several studies on multiple organic solvents reported that self-rated psychiatric symptoms were significantly related to chronic exposure to organic solvents in Korean workers (42, 43).

Occupational psychiatric disorders in Korean workers

Several Korean psychiatrists have examined the prevalence of subclinical psychiatric disorders, that is, psychiatric symptoms that do not meet criteria for a diagnosis according to ICD-10 or DSM-IV-TR, among industrial injury patients admitted to hospitals using self-rating scales such as the Beck Depression Inventory (BDI), State-Trait Anxiety Inventory (STAI) and Symptom Check-list-90-R (SCL-90-R). One study found that industrial injury patients feel negatively about their quality of life and experience more depression and suicidal ideation compared with healthy workers. Based on these findings, the researchers suggested that psychiatric intervention was necessary to prevent depression and suicidal ideation/action as a result of industrial injury (44). A few studies on industrial injury patients have used psychiatric symptom scales and a structured interview, the Clinician-administered Posttraumatic Stress Disorder Scale (CAPS), which is known as the "gold standard" for assessing posttraumatic stress disorder in individuals over the age of 15 (45, 46). Patients admitted to the hospital for industrial injuries reported more psychiatric symptoms, such as depression and anxiety, than did healthy workers. After these interviews, 12 (25%) of the 47 patients were diagnosed with PTSD (46).

Several clinical studies on occupational psychiatric disorders in Korean workers have been conducted. Woo et al. (47) evaluated the prevalence of PTSD and its comorbidity with panic disorders among subway conductors who experienced accidents on the track. They also examined differences between conductors who had and had not experienced accidents with respect to panic disorders, stress levels, work-related problems, and sleep disturbances. A total of 628 subway conductors in the Seoul metropolitan area participated in this study. The data showed that the prevalence of PTSD and comorbid panic disorder was significantly higher among those drivers who had experienced accidents than among those who had not. Conductors who had experienced accidents showed significantly higher somatic, de-

pressive, and anger symptoms on measures of stress as well as more sleep problems than did drivers who had not experienced accidents.

Major depressive disorder (MDD) directly and indirectly causes distress and socioeconomic difficulties. For this reason, several Korean researchers have studied the impact of MDD on the productivity of workers. Kim et al. (48) compared the productivity of workers with MDD visiting psychiatric outpatient clinics with those of healthy controls. Absenteeism and the tendency to leave work early were significantly more pronounced, and performance was much lower in the depressed group. The estimated cost of absenteeism was higher in the depression than in the control group by 2,520,000 Korean won per year; the estimated cost of absenteeism was also higher in the former than in the latter group (by 4,880,000 Korean Won per year). The total cost of lost productive time (LPT) was higher in the depression than in the control group by 7,400,000 Korean won, which corresponds to 26% of the mean annual salary of Korean workers.

Occupational psychiatric disorders compensated by Industrial Accident Compensation Insurance (IACI)

Work-related psychiatric disorders are not included in the annual reports of Statistics on Occupational Injuries and Diseases in Korea. Therefore, we estimated the number of work-related psychiatric disorders on the basis of the category covering "other work-related diseases" (overwork, stress, liver disease, psychiatric disorders, etc.) (49). The annual numbers of "other work-related diseases" for each year from 2001 to 2007 were 248, 183, 335, 294, 236, 221, and 158, respectively (Fig. 1). The majority of these cases may be work-related psychiatric disorders. These statistics are influenced by changes in the related regulations and social environments of Korea, including a class action suit related to industrial accident compensation insurance benefits. For example, in 2003, 10 workers at one Korean general hospital requested compensation for occupational psychiatric diseases (50).

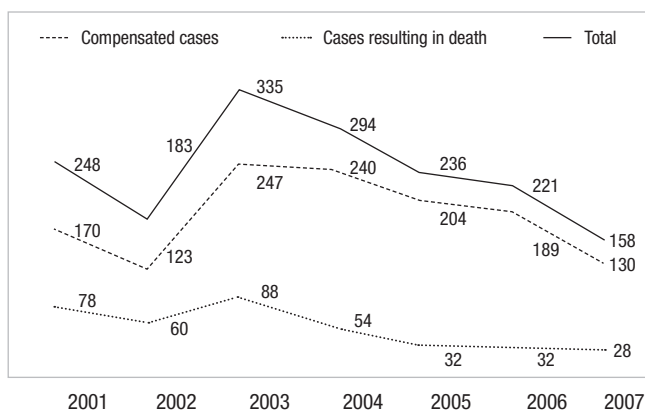


Fig. 1. Other work-related diseases (overwork, stress, liver disease, psychiatric disorders, etc.) in Korea from 2001 to 2007.

A few studies have analyzed the characteristics of occupational diseases, including psychiatric disorders, using the COMWEL database (5, 14, 51, 52). Ahn et al. (51) analyzed 575 approved occupational disease (excluding occupational injury) cases that occurred in 1999 and were approved by June 30, 2000. Only seven cases of psychiatric disorders were identified: two cases of somatoform disorder, two cases of PTSD, one case of adjustment disorder, and two unspecified cases (headache and dizziness) (51). Another study using this database was conducted by Ahn et al. (52) in 2004. This study analyzed 4,240 cases of compensated occupational disease that occurred from 2001 to 2003. They excluded work-related diseases, cardiovascular disorders, instances of low back pain, and cases involving occupational injury. Only two cases of mental and behavioral disorders were observed; one involved a schizophrenic patient who was exposed to organic solvents, and the other involved a PTSD patient. These were the only psychiatric statistics in the COMWEL database at that time, and the system used to classify psychiatric diseases experienced by insured patients was not specified. Additionally, most of the compensated psychiatric disorders related to occupational injury and trauma (i.e., organic mental disorders and PTSD).

To understand the characteristics of work-related psychiatric diseases, Choi et al. (5) examined 3,175 cases in which workers were compensated for psychiatric disorders; all of these were classified based on ICD-10 F-codes. This study arbitrarily selected only three (work-related disorders excluding pneumoconiosis and cardiovascular diseases, pneumoconiosis, and work-related diseases including cardiovascular diseases) of 22 possible categories for coding work-related cases. Other disorders were classified as accidental. In Korea, work-related psychiatric injuries have increased annually. In total, 897, 1,099, and 1,179 cases were compensated in 2001, 2002, and 2003, respectively (Table 1). The primary compensated occupational psychiatric disorders were "personality and behavioral disorders due to brain disease, damage, and dysfunction," "other mental disorders due to brain damage and dysfunction and to physical diseases," "reactions to severe stress and adjustment disorders," "depressive episodes," and "other anxiety disorders." This study also showed that workers in their 30s and 40s had the highest prevalence of psychiatric disorders and that work-related psychiatric disorders were more likely to occur in small factories (those employing 5–50 workers) compared with other age groups (5).

Table 1. Requested and approved compensation of work-related psychiatric injuries from 2001 to 2003

Year	Work related	Accidental	Total
2001	134 (121)	822 (776)	956 (897)
2002	238 (205)	961 (894)	1,199 (1,099)
2003	234 (189)	1,062 (990)	1,296 (1,179)
Total	606 (515)	2,845 (2,660)	3,451 (3,175)

(), compensated cases.

Table 2. Distribution of occupational psychiatric disorders in Korea from 2001 to 2003 by ICD-10 classification

Disease classification		No. of workers (%)	
		Accidental	Non-accidental
F00–F09	Organic, including symptomatic mental disorders	1,350 (50.8)	274 (53.2)
F10–F19	Mental and behavioral disorders due to psychoactive substance use	8 (0.3)	3 (0.6)
F20–F29	Schizophrenia, schizotypal, and delusional disorders	44 (1.7)	11 (2.1)
F30–F39	Mood (affective) disorders	257 (9.7)	88 (17.1)
F40–F48	Neurotic, stress-related, and somatoform disorders	805 (30.3)	80 (15.5)
F50–F59	Behavioral syndromes associated with physiological disturbance and physical factors	91 (3.4)	6 (1.2)
F60–F69	Disorders of adult personality and behavior	21 (0.7)	3 (0.6)
F70–F79	Mental retardation	0	0
F80–F89	Disorders of psychological development	16 (0.6)	30 (5.8)
F90–F98	Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	18 (0.7)	8 (1.6)
F99	Unspecified mental disorder	50 (1.9)	12 (2.3)
Total (N=3,175)		2,660 (100.0)	515 (100.0)

Excluding work-related accidental injuries, 515 cases of work-related psychiatric disorder were identified. In 2001, 2002, and 2003, 121, 204, and 189 cases, respectively, were reported annually. According to the ICD-10 classification, the majority of work-related accidental injuries (1,350 cases, 50.8%) were “F00–F09 organic, including symptomatic, mental disorders”; this was followed by “F40–F48 neurotic, stress-related, and somatoform disorders” (805 cases, 30.3%) and “F30–F39 mood (affective) disorders” (257 cases, 9.7%) (Table 2). Among non-accidental (i.e., work-related) psychiatric disorders, F00–F09 (organic, including symptomatic mental disorders) were also the most common (53.2%), followed by F30–F39 (mood/affective disorders) and F40–F48 (neurotic, stress-related and somatoform disorders). Because the COMWEL cases were coded according to 22 accident types, Choi et al. (5) classified “work-related disorders (except pneumoconiosis and cardiovascular disease);” “pneumoconiosis;” and “work-related diseases (cardiovascular disease)” as work-related disorders; disorders represented by other categories were identified as accidental. Because it was very difficult to differentiate work-related psychiatric disorders from accidental injuries, F00–F09 (organic, including symptomatic mental disorders) codes were quite prevalent (53.2%). The skewed COMWEL data may also be attributable to human error. Indeed, the COMWEL data include several other misclassifications, such as “F10–F19 mental and behavioral disorders due to psychoactive substance use;” “F60–F69 disorders of adult personality and behavior;” “F80–F89 disorders of psychological development;” and “F90–F98 behavioral and emotional disorders with onset usually occurring in childhood and adolescence.” These clearly should not be considered work-related diseases (5).

In 2008, Ahn and Choi reanalyzed work-related psychiatric disorders using five years of data (1999–2004) from COMWEL as well as epidemiological data on work-related conditions obtained from a survey conducted by the Occupational Safety and Health Research Institute (OSHRI) of the Korea Occupational Safety and Health Agency (KOSHA) (14). A total of 187 cases

were identified as work-related psychiatric disorders. The most common mental and behavioral disorders were “reaction to severe stress and adjustment disorders” (F43; 73 cases, 39.0%), followed by “depressive episode” (F32; 49 cases, 26.2%) and “other anxiety disorders” (F41; 34 cases, 18.2%). A plurality (50 cases, 26.7%) of those classified as suffering from mental and behavioral disorders had been working for 10–19 yr. The mean duration of medical treatment was 319 days, and 28.3% of workers spent more than one year recuperating. The main occupational stressors related to work-related psychiatric disorders were difficulties in personal relationships with colleagues, unfair pressure about dismissal, discrimination, malicious practices leading to the alienation of colleagues, and over- and under-working in the context of extreme stress.

CONCLUSION

Recent increasing interest in the psychological problems of workers in Korea has created momentum for studying work-related psychiatric disorders. However, no category for work-related psychiatric disorders is included in the annual statistics on occupational injuries in Korea. According to several studies using the COMWEL database, the number of compensated psychiatric disorders is far from negligible. Additional preventive efforts and studies are needed to manage occupational psychiatric disorders among Korean workers.

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