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# Prevalence, correlates, and comorbidities of four DSM-IV specific phobia subtypes: Results from the Korean Epidemiological Catchment Area study

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## ABSTRACT

Although several studies have detected differences in clinical features among specific phobias, there is a shortage of detailed national data on the on the DSM-IV SP subtypes, particularly in the Asian population. To examine the prevalence, demographic and other correlates, and co-morbidities of DSM-IV SP subtypes in a nationwide sample of Korean adults. We recruited 6510 participants aged 18–64 years for this study. Lay interviewers used the Composite International Diagnostic Interview to assess participants. We analyzed socio-demographics, health-related correlates and frequencies of comorbid mental disorders among participants with SP and each subtypes compared to unaffected adults. The prevalence of lifetime DSM-IV SP was 3.8%, and animal phobias were the most prevalent type of SP. Blood–injection–injury phobia was negatively associated with education, whereas situational phobia was positively associated with education. The strongest mental disorder comorbidity was associated with situational phobia; there is a higher probability of comorbid mood (OR=5.73, 95% CI=2.09–15.73), anxiety (OR=7.54, 95% CI=2.34–24.28), and somatoform disorders (OR=7.61, 95% CI=1.64–35.22) with this subtype. Blood–injection–injury phobia was highly associated with alcohol dependence (OR=9.02, 95% CI=3.54–23.02). Specific phobias are heterogeneous with respect to socio-demographic characteristics and comorbidity pattern. Implications of the usefulness of current subtype categories should continue to be investigated.

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## 1. Introduction

Specific phobia (SP) is characterized by a marked, persistent, and unreasonable fear of discernible objects or situations (American Psychiatric Association, 1997). SP is one of the most common mental disorders, with prevalence rates ranging from 2.6% to 12.5% (Kessler et al., 1994, 2005; Grant et al., 2004; Lee et al., 2007), and is associated with substantial impairment in psychosocial functioning and perceived interference with life (Magee et al., 1996; Curtis et al., 1998; Wells et al., 2006;

Stinson et al., 2007) as well as comorbid disorders such as agoraphobia, social phobia, and generalized anxiety disorder (Magee et al., 1996; Curtis et al., 1998; Sareen et al., 2001; Scott et al., 2006; Stinson et al., 2007; Tsuchiya et al., 2009). With the introduction of the DSM-IV, SP was differentiated into five phobia subtypes: animal phobias, natural environment phobias, blood–injection–injury phobias, situational phobias, and other phobias (American Psychiatric Association, 1997). The DSM-V's proposed revision maintains the five subtypes of SP from the DSM-IV (LeBeau et al., 2010). Evidence of SP's heterogeneity comes from several areas of research, including clinical (Ost, 1987; Himle et al., 1989; Lipsitz et al., 2002), family (Fyer et al., 1990), and genetic studies (Kendler et al., 1992, 2001; Hettema et al., 2005). However, little community-based epidemiological data are

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currently available regarding these subtypes (Fredrikson et al., 1996; Becker et al., 2007; Depla et al., 2008).

Fredrikson et al. (1996) reported the prevalence of specific fears and phobias in 704 adults from Stockholm aged 18–70 years, and their results suggested that SP is heterogeneously distributed with respect to sex and age. In a community-based sample of 18–24-year-old women in Dresden, Germany, there were significant differences in the mean age of onset and comorbidity patterns between subtypes, but no significant differences were found in levels of impairment according to the subtypes (Becker et al., 2007). In addition, a community study of children and adolescents aged 6–17 years in Seoul, Korea, found significant differences in demographic characteristics, comorbid mental disorders, and emotional/behavioral problems among animal phobias, natural environment phobias, and blood–injection–injury phobias. In the cited study, the situation subtype was excluded from analysis because of an insufficient sample size. The two studies cited above suffered from limited generalizability, because only young women (Becker et al., 2007) or children and adolescents were included in these surveys. Depla et al. (2008) examined the prevalence rate and determinants of SP, as well as the degree of impairment and comorbid disorders associated with SP, among eight fear subtypes in Dutch 18–65-year-olds. The presence of any irrational fear of eight items was initially assessed: respondents who answered affirmatively to at least one item were asked to complete several additional questions to ascertain whether one or more reported fears met the full DSM-III-R criteria for a specific phobia. Because the Composite International Diagnostic Interview (CIDI; version 1.1) used in this study did not record this supplementary information in direct reference to each separate fear, the authors could not determine which irrational fears actually provoked SP development, and the reported fears thus included not only fears serious enough to meet DSM-III-R criteria for SP but also some sub-threshold fears. Within the context of this limitation, researchers have found that the SP with fear of situation or fear of blood/injury were significant predictors of impairments and comorbid mental disorders, in contrast to the SP with fear of animals or fear of natural environment.

Given the dearth of epidemiological data on the DSM-IV SP subtypes, particularly in the general Asian population, and given the methodological limitation of prior works, we set out to examine the prevalence, correlates, and co-morbidities associated with SP and its subtypes in Korea.

## 2. Methods

### 2.1. Participants

The Korean Epidemiologic Catchment Area (KECA) study was conducted in 2001 using the Korean version of the Composite International Diagnostic Interview 2.1 (K-CIDI 2.1) (Cho et al., 2007). In 2006–2007, researchers planned to replicate the Korean Epidemiologic Catchment Area (KECA-R) to determine the epidemiology of additional mental illnesses such as ADHD (Park et al., 2011), sleep problems (Park et al., 2010a), pathological gambling (Park et al., 2010b), suicide (Jeon et al., 2010) and other major mental disorders (Cho et al., 2010, 2011) in Korean adults. Participants were selected using a stratified, multi-stage, cluster sample design, based on a population census conducted by community registry offices in 2005. The registry chose one person per selected household based on the day of the month the person was born. From an initial pool of 7968 participants aged between 18 and 64 years, 6510 face-to-face interviews were conducted (response rate 81.7%).

The study recruited 79 interviewers from each catchment area, including psychiatric nurses, social workers, and medical students. These interviewers had experience with psychiatric epidemiologic surveys and were familiar with their catchment area. The trainers were three psychiatrists, all of whom had received their certification at the University of Michigan CIDI Training and Reference Center in Ann Arbor, Michigan (USA). All the interviewers underwent a 5-day training session, which included didactic sessions concerning general interview skills, the

interview instrument, mock interviews, and role-playing exercises. Throughout the training sessions, the trainers monitored the interviews using a closed circuit television and gave feedback to the interviewers.

The institutional review board of the College of Medicine at Seoul National University approved the study protocol. Each participant was fully informed of the study's objectives and methods before participating, and each participant provided written informed consent.

### 2.2. Lifetime specific phobia

To determine the diagnosis of SP and other DSM-IV mental disorders, trained lay interviewers administered the Korean version of the CIDI (K-CIDI; version 2.1; Cho et al., 2002) to each participant. The K-CIDI (World Health Organization, 1990) is a structured diagnostic interview designed to diagnose mental disorders using DSM-IV criteria (American Psychiatric Association, 2000). The K-CIDI (Cho et al., 2002) was validated according to World Health Organization guidelines (World Health Organization, 1997). The inter-rater reliability, test/retest reliability, and validity of the K-CIDI for specific phobia were 0.98, 0.70, and 0.60, respectively.

To arrive at a SP diagnosis, interviewers asked respondents if they had ever experienced a strong, unreasonable fear of a specific object/situation or had otherwise tried to avoid said object/situation. We selected and grouped SP objects/situations based on the DSM-IV SP subtypes: animal phobias (e.g., insects, snakes, birds, or other animals), natural environment phobias (e.g., heights, storms, thunder or lightning, or swimming in water), situational phobias (e.g., flying in an airplane or being in closed spaces such as caves, tunnels or lifts), and blood–injection–injury phobias (e.g., seeing blood, getting an injection, or going to a dentist or hospital). We did not study other phobic stimuli not covered by the specific categories. Interviewers asked respondents who answered affirmatively to at least one item to complete several additional questions in order to ascertain whether one or more of the reported fears met the DSM-IV criteria for SP. Unlike CIDI version 1.1, CIDI version 2.1 recorded this supplementary information in reference to separate group of fears. Thus, we were able to determine which particular group of fears met the full criteria for SP, although determining which fear in the same group met DSM-IV criteria for SP was impossible.

Among the 247 respondents who met DSM-IV SP criteria, 217 had phobias from only one of the four DSM-IV subtypes. To filter out the confounding influences of co-occurring phobias, we excluded 30 people who had additional phobias from another subtype from each subtype group and classified these people as having “two or more” types.

### 2.3. Lifetime prevalence rate of other DSM-IV mental disorders

As with SP, we determined the lifetime prevalence rate of other DSM-IV mental disorders using the K-CIDI. The inter-rater reliability, test/retest reliability, and validity of the K-CIDI ranged from 0.86 to 1.00, 0.42 to 0.89, and 0.50 to 1.00, respectively (Cho et al., 2002). The variable “any mood disorder” refers to the occurrence of one or more of the following mood disorders: major depressive disorder, dysthymia, and bipolar disorder. The variable “any other anxiety disorder” refers to the occurrence of one or more of the following anxiety disorders: obsessive-compulsive disorder, post-traumatic stress disorder, panic disorder, agoraphobia, social phobia, and generalized anxiety disorder. The variable “any somatoform disorder” indicates one or more of the following disorders: somatization disorder, conversion disorder, pain disorder, and hypochondriasis. Because of their low prevalence, we did not analyze some mood and anxiety disorders (i.e., dysthymia, panic disorder, and agoraphobia) or any of the somatoform disorders individually.

### 2.4. Age of onset of SP

Because symptoms of specific phobias often fluctuate over time, retrospectively determining the age at which a fear first began to cause significant impairment or distress (i.e., the age at which the DSM-IV criteria are first met) is difficult. Therefore, the CIDI dates phobia onset from the time at which the fear became associated with avoidance or endurance with intense anxiety, regardless of whether the phobia caused a significant impairment or distress at the time.

### 2.5. Other variables

We used self-reported questionnaire data from the 2006 KECA-R study to obtain information on sociodemographic (e.g., sex, age, marital status, education, occupation) and health-related characteristics (e.g., current alcohol use, physical activity, medical illness, lifetime use of mental health service).

The short-form Korean version of the International Physical Activity Questionnaire (IPAQ) estimates levels of physical activity (Oh et al., 2007). The IPAQ asks respondents to rate the frequency and duration of walking and moderate- and vigorous-intensity activities that are performed for at least 10 min/session. We categorized participants into three groups based on their IPAQ scores:

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