



## The prevalence of specific phobia and associated co-morbid features in children and adolescents

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### ABSTRACT

**Objective:** The aims of this study were to investigate the prevalence, associated co-morbid psychiatric disorders and behavioral/emotional problems associated with the subtypes of specific phobia in children and adolescents.

**Methods:** A total of 2673 randomly selected children and adolescents from Seoul, Korea were assessed using the parent version of the Diagnostic Interview Schedule for Children (DISC-IV) and Children's Behavior Checklist (CBCL). We analyzed differences in psychiatric co-morbidities and CBCL profiles among the subtypes of specific phobia.

**Results:** The 1-year prevalence of specific phobia was 7.9% (95% CI 7.63–8.17). Animal phobia was associated with anxiety disorder (OR 8.68, 95% CI 1.91–39.51) and oppositional defiant disorder (OR 2.55, 95% CI 1.27–5.12). Nature–environment phobia was associated with anxiety disorder (OR 25.70, 95% CI 6.16–107.10). Blood–injection–injury phobia showed associations with attention-deficit/hyperactivity disorder (ADHD; OR 6.74, 95% CI 2.81–16.15). Subjects with nature–environment phobia scored higher than did controls on the anxious/depressed, social problems, attention problems, and total behavioral problem profiles of the CBCL. Subjects with blood–injection–injury phobia scored significantly higher than did controls on the attention problems, aggressive behaviors, and externalizing problem profiles.

**Conclusions:** Contrary to animal phobias, nature–environment and blood–injection–injury phobias were associated with various behavioral and emotional problems and approximately correlated to their co-morbid psychiatric disorders. Among these subtypes, significant differences were found in demographic characteristics, co-morbid psychiatric disorders, and emotional/behavioral problems. These findings suggest that distinctive clinical characteristics might be related with different subtypes of specific phobia and clinician must consider psychiatric co-morbidities when treating children & adolescents with specific phobia.

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### 1. Introduction

Only a small body of literature examines the epidemiology and clinical features of childhood specific phobia based on DSM-IV or ICD-10 defined criteria. Moreover, few studies have specifically examined the subtypes of specific phobia. According to DSM-IV, the prevalence rates of specific phobias vary across cultures and ethnicities. Previous studies of children have found prevalence rates of between 2.4% and 3.6% in New Zealand (Anderson, Williams, McGee, & Silva, 1987; McGee, Feehan, Williams, & Anderson, 1990), 2.6% in Puerto Rico (Bird et al., 1988), 2.6% in Switzerland (Steinhausen, Metzke, Meier, & Kannenberg, 1998), and 3.5% in Germany (Essau, Conradt, & Petermann, 2000). Using a sample of 3021

individuals aged 14–24 years in Munich, Wittchen, Nelson, and Lachner (1998) reported a lifetime prevalence of specific phobia of 2.3% and a 12-month prevalence of 1.8%.

Just a few epidemiological studies have assessed the psychiatric co-morbidities of specific phobia, and even less information is available on co-morbidity with regard to its specific subtypes. Lewinsohn, Zinbarg, Seeley, Lewinsohn, and Sack (1997) examined lifetime co-morbidities of anxiety disorders in a community sample of high school adolescents aged 14–19 years. Specific phobia was found to be highly co-morbid with separation anxiety disorder (odds ratio (OR): 4.7) and social phobia (OR: 7.2). In an epidemiologic study of 36 adolescents aged 12–17 years with specific phobias, Essau et al. (2000) reported that 47.2% of subjects had co-morbid anxiety disorders, 36.1% had co-morbid depressive disorders, 33.3% had co-morbid somatoform disorders, and 8.3% had co-morbid substance use disorders. Becker et al. (2007) reported the lifetime prevalence of co-morbidity among the sub-

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types of specific phobia in a community sample of young women aged 18–24. In their study, animal phobias were significantly associated with other anxiety disorder (OR 2.36), affective disorder (OR 3.07), somatoform disorder (OR 3.99), and substance disorder (OR 4.00) but not with eating disorders. Height phobia was only associated with anxiety disorders (OR 2.72). The blood–injection–injury subtype of specific phobia was also related to anxiety disorders (OR 5.24).

As mentioned above, co-morbid psychiatric disorders among the specific phobia subtypes in samples of young adults or adolescents have been examined in several studies. However, no studies have evaluated those co-morbid features in samples including children. In addition, very few studies have examined differences in behavioral or emotional characteristics among the subtypes of specific phobia. Moreover, to the best of our knowledge, no previous study has used an Asian community sample. Thus, the aim of the current study was to investigate the prevalence of specific phobias and to explore whether different co-morbidities and different behavioral/emotional characteristics was associated with each subtype of specific phobia in a community sample of Korean children and adolescents.

## 2. Methods

### 2.1. Subjects and procedures

This study formed a part of the Seoul Mental Health Epidemiologic Study for Children and Adolescents (Cho et al., 2006a,b), which is a cross-sectional study that was conducted in Seoul, Korea, between September 2005 and February 2006. The subjects were 6–17 year old children and adolescents attending schools in Seoul, Korea. Subjects for the study were recruited using a multi-stage stratified random selection method. For the present study, Seoul was divided into six school districts based on the socioeconomic status of residents. Seven elementary, six middle, and six high schools were randomly selected to provide a representative sample. Ten classes were randomly selected from each elementary school, and three classes were randomly selected from each middle and high school. The interviewers were educated lay volunteers, all of whom were educated to at least to the bachelor's degree level. All had previously been educated in the practice of the Diagnostic Interview Schedule for Children version IV, parent version (DISC-IV) by skilled psychiatrists, and they received constant quality control monitoring by psychiatrists from the Department of Child and Adolescent Psychiatry at Seoul National University Hospital. The interviewers scheduled interviews with subjects' parents by phone and then conducted the interviews at the relevant schools. They gave full explanations of the study procedures to the subjects' parents and obtained informed consent for their children's participation in the study. Parents of 2673 students completed the Diagnostic Interview Schedule for Children, 4th edition (DISC-IV). The students consisted of 1645 children and 1028 adolescents. The children and adolescents completed the Korean version of the Children's Depression Inventory (CDI); thus, the assessment of depressive disorder was made not by parents, but by the children themselves. The subtypes of specific phobia were determined according to DSM-IV criteria based on questions in DISC-IV about what makes their child fearful. Specific phobias included (1) animal type; (2) nature–environment type, including height, thunder, lightning, darkness and water; (3) blood–injection–injury type including needles, blood, seeing laceration wounds, and injection; (4) situational type, including bridges, tunnels, highways, elevators, and escalators. The parents of the subjects also filled out the parent's version of the Korean edition of the Children Behavior Checklist (K-CBCL). Control subjects were randomly selected from an age- and gender-

matched group of those without a specific phobia. The control group was used as the reference group when CBCL mean *T*-scores for specific phobia subtypes were compared. The study protocol was approved by Seoul National University Institutional Review Board.

### 2.2. Assessment measures

- (1) Diagnostic Interview Schedule for Children, 4th edition (DISC-IV): psychiatric disorders, as defined by the DSM-IV, were assessed using the Korean version of the DISC-IV. Interviews were organized into six diagnostic sections: anxiety disorders, mood disorders, disruptive behavior disorders, substance use disorders, Schizophrenia, and miscellaneous disorders (eating, elimination, and tic disorders, pica and trichotillomania). In this study, the DISC-IV scoring algorithms for ascertaining the presence of a diagnosis were derived based on data from parents. Good test–retest reliability of the DISC-IV has been reported (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The reliability and validity of the Korean version of the DISC-IV have been previously determined and reported (Cho et al., 2006a,b).
- (2) Child Behavior Checklist (CBCL): the empirically derived CBCL (Achenbach, 1991) is one of the most-studied instruments for the evaluation of child and adolescent psychopathology. It contains 112 behavioral items, which are scored by a parent. The social competence scale can be subdivided into three areas; activities, social, and school scales, and the sum of the scores on these subscales yields a total competence score. The behavioral/emotional problem scores are divided into three broad dimensions: internalizing, externalizing and mixed categories, which form a total behavior problem score (excluding items 2 and 4). The internalizing scale consists of three subscales; withdrawn, somatic complaints and anxious/depressed syndromes; the externalizing scale consists of the delinquency and aggression scores, and the mixed category includes thought, social, and attention problems. Parents were asked to rate children's behavior problems on a 0–2 scale (0 = “not true”; 1 = “somewhat or sometimes true”; 2 = “very true or often true”) for the previous 6 months. Numerous studies have confirmed the stability of the instrument's psychometric properties, showing good validity in both clinical and non-clinical populations (Biederman et al., 1993, 2001). The Korean version of the CBCL was standardized in 1997 (Oh & Lee, 1997).
- (3) The Children's Depression Inventory (CDI): the Children's Depression Inventory (CDI; Kovacs, 1985), which was completed by the 7–17 year old children and adolescents, is the self-rating scale measuring the severity of depressive symptoms, scored from 0 to 2. Subjects are asked to refer to their feelings, cognitions, and behavior during the past 2 weeks through 27 items. The Korean version of the CDI was standardized in 1990 (Cho & Lee, 1990) and its validity and reliability in Korea has been previously been well established and reported (Cronbach's  $\alpha = 0.88$ ). A total score of 22 was considered to be a cutoff point for screening depression in the Korean version.

### 2.3. Data analysis

The ratio of children to adolescents, gender differences, and socioeconomic status (SES) of each specific phobia group was compared with those of the control group using a chi-squared test. We divided age into four groups to assess prevalence according to age: 6–8, 9–11, 12–14, and 15–17 years. A one-way ANOVA was performed to assess differences in mean age between each subtype group and the control group. Co-morbid psychiatric disorders were also assessed by DISC-IV. Logistic regressions were performed to analyze the odds ratio of co-morbidities of each subtype compared

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