# Anxiety sensitivity: Another reason to separate dental fears from blood–injury fears?

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A B S T R A C T

Although dental phobia is classified under the heading of blood–injury phobia, studies show differences between the two conditions in terms of frequency of fainting and gender distribution. Anxiety sensitivity (AS), which refers to discomfort and negative attributions to bodily anxiety sensations, was useful in differentiating panic anxiety from other phobic anxieties. No study has compared dental phobia with blood–injury phobia directly. We examined 61 subjects, working at a military aircraft factory, using measures on demographics, dental fears (MDAS – Modified Dental Anxiety Scale) and blood–injury fears (MBPI – Multidimensional Blood/Injury Phobia Inventory), in addition to Anxiety Sensitivity Index. Regression analyses revealed that dental phobia was predicted by ASI, whereas blood/injury phobia was not. Our results provide additional support for the proposed distinction between the two conditions.

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## 1. Introduction

Dental phobia is defined as unreasonable fear of going to the dentist or of dental procedures, which can be disabling if avoidance is severe. Although dental phobia is classified under blood–injury phobias in DSM 5 (American Psychiatric Association, 2013), accumulating evidence suggests that the two conditions may be two distinct clinical syndromes. Öst (1992), for example, has shown that only 8 out of 81 blood phobics, and 10 out of 59 injection phobics also have dental phobia. Similarly, Poulton, Thompson, Brown, and Silva (1998) have shown that out of 96 dental phobics only %10 had blood phobia. One of the main findings suggesting a distinction between the two conditions is the relative absence of fainting among dental phobics compared to blood phobics. In the study of De Jongh, Bongaarts, and Vermeule (1998), none of the participants with dental phobia fainted during dental treatment. The phobic stimulus also seem to be different for the two conditions: the most distressing stimuli for blood–injury phobics are reported to be the sight of blood, needles and wounds; whereas dental phobics list the sight and sound of the aerator and dental treatment settings as their top-feared situations (De Jongh, Muris, ter Horst, & Duyx, 1995; Kleinknecht, Klepac, & Alexander, 1973; Roy-Byrne, Milgrom, Tay, Weinstein, & Katon, 1994; Stouthard & Hoogstraten, 1987). De Jongh, Bongaarts, and Vermeule (1998) showed that the typical phobic stimulus for blood phobics (i.e. sight of blood) was feared by only 8% of dental phobics. Gender distribution is also dissimilar in two fear groups: blood–injury phobia is more common in women, whereas no gender difference could be shown in dental phobics (Berggren, Carlsson, Gustafsson, & Hakeberg 1995; Fredrikson, Annas, Fischer, & Wik, 1996; Öst, Sterner, & Lindahl, 1984; Thomson, Locker, & Poulton, 2000).

There is also support, although indirect from imaging studies for the proposed distinction between the two conditions. In two fMRI studies comparing animal phobics to blood phobics (Caseras, Giampietro, & Lamas, 2010) or to dental phobics (Lueken et al., 2011), the activation was similar for animal phobics in both studies (i.e. limbic cortex), whereas there was a sharp contrast between blood and dental phobics in terms of the area where the activation is observed (i.e. occipito–temporal cortex in blood phobics vs. prefrontal cortex in dental phobics).

Anxiety sensitivity (AS) refers to discomfort and negative attributions to anxiety sensations arising from the belief that these sensations are signs of physical, psychological or social harm (Reiss & McNally, 1985). AS was useful in differentiating panic anxiety from other phobic anxieties. Studies examining AS levels among

dental or blood phobics are few. In the study of Locker, Shapiro, and Liddell (1997), higher AS levels were measured among dental phobics relative to controls and also among blood phobics relative to controls. Another study has shown that AS correlated with fear severity in dental or blood phobia (van Wijk, de Jongh, & Lindeboom, 2010). There are however, no studies comparing blood and dental fears in terms of AS levels.

We investigated a sample of factory workers attending a routine dental examination in order to show if the dental fears differ from blood/injury fears, in terms of anxiety sensitivity, in addition to other demographic or clinical variables. In line with the existing literature suggesting blood phobia to be more related to environmental factors than dental phobia, we hypothesized that those with primarily dental fears would have lower AS than those with primarily blood–injury fears.

## 2. Method

### 2.1. Sample

The sample consisted of 61 workers and administrative staff, working at a military helicopter maintenance factory. It was a subset (those who had a score of 15 or higher on MDAS [Modified Dental Anxiety Scale] were included) of a larger sample of 477 workers, who were assessed using MDAS and MBPI (Multidimensional Blood/Injury Phobia Inventory), for a reliability study of the Turkish MBPI (Ak, Ak, & Kılıç, 2013). The subsample ($N = 61$) was given additional assessments, including a self-report measure of AS (ASI). The subsample was more symptomatic than the original sample, but was similar in terms of gender, age and education.

### 2.2. Measures

#### 2.2.1. Demographics

This section included information on demographic variables such as age, gender, education and income as well as personal and family history of psychological problems, and use of mental health services.

#### 2.2.2. Modified Dental Anxiety Scale – MDAS (Humphris, Morrison, & Lindsay, 1995)

The MDAS is a self-report questionnaire consisting of five items each with a five-category rating scale, ranging from "not anxious" to "extremely anxious". This rating system is a similar version of Corah's Dental Anxiety Scale (DAS; Corah, 1969), which was a four-item measure of dental anxiety. The MDAS' extra item is about the respondent's anxiety to a local anesthetic injection. A total score of 15 or higher is suggested to be indicative of dental phobia. Reliability and validity studies were conducted in Turkish (Tunç, Fırat, Onur, & Şar, 2005).

#### 2.2.3. Multidimensional Blood/Injury Phobia Inventory – MBPI (Wenzel & Holt, 2003)

The MBPI was developed from a theoretical framework to characterize a broad range of feared stimuli and phobic reactions associated with this pathology. It consists of 40 items that cross four types of stimulus content (injections, hospitals, blood, injury), five types of phobic responses (fear, avoidance, worry, fainting, disgust), and a self-versus other focus. The items are coded between Very Slightly/Not at all (0 point) and Extremely (4 points), yielding a total score between 0 and 160. The MBPI does not include items on dental fears. Reliability in Turkish was recently published (Ak et al., 2013).

#### 2.2.4. The Anxiety Sensitivity Index – ASI (Reiss, Peterson, Gursky & McNally, 1986)

The ASI is the main measure used to assess AS in adults. It has 16 items each specifying a possible negative consequence to the experience of anxiety. These consequences include Additional Anxiety or Fear, Illness, Embarrassment, and Loss of Control. Each item is rated according to a 5-point Likert scale: 0 (very little), 1 (a little), 2 (some), 3 (much), and 4 (very much). The Anxiety Sensitivity score is the sum of the scores on the 16 items. It was translated in to Turkish (Dilbaz & Güz, 2001).

### 2.3. Procedure

The subjects were assessed using a battery of self-report measures during the months of July–August in 2009. All assessments took place at the factory, mostly at the dentist's office. The quality of data collected was checked by the study co-author, who was the dentist at the factory; respondents were contacted to complete any missing data within the same or next day of data collection.

### 2.4. Statistical analyses and variable transformations

The outcome variables were the measures of blood–injury phobia and dental phobia, which were measured as the total scores of MBPI and MDAS, respectively. Chi-square tests were used for categorical variables; $t$-tests and ANOVAs for continuous ones. SPSS version 13.0 was used for analyses. Linear regression analyses were used to determine the predictors of MDAS and MBPI.

The study was approved by the ethics committee of Hacettepe University.

## 3. Results

### 3.1. Sociodemographic variables

The sample was predominantly male (54 males, 7 females), which is typical of most military-owned production facilities in Turkey. The mean age of respondents was 40.2 (sd: 7.1, range 26–54); one third had university education.

### 3.2. Clinical variables

Total score of MDAS and MBPI were 18.3 (sd: 2.9) and 37.1 (sd: 28.5), respectively. There was no gender effect on these scores. MDAS and MBPI did not correlate with age or education, either. MBPI scores correlated positively with MDAS scores (.25). Interestingly, although MBPI scores had a strong positive correlation with ASI (.32), MDAS score's correlation with ASI was close to zero. ASI scores did not relate to gender or age, but had a negative correlation with education (−.31). (Table 1).

### 3.3. Predictors of MBPI and MDAS

Multiple linear regressions were used to determine the independent predictors of MBPI and MDAS total scores. Since the sample size was small, we could include only four explanatory variables

**Table 1**
Correlations between MDAS and MBPI scores with ASI and demographic variables.

|  | MDAS score | MBPI score | ASI |
|---|---|---|---|
| Age | −.11 | .16 | .06 |
| Education | −.14 | −.12 | −.31 |
| Income | .17 | .16 | .07 |
| MDAS score | 1 | .25 | .06 |
| MBPI score | .25 | 1 | .32 |