

Common Fears and Their Relationship to Dental Fear and Utilization of the Dentist

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Common fears were studied by household telephone interviews and mail survey in Seattle, Washington, to determine their relationship to dental fear and to utilization of the dentist. Dental fear was either the first or second most common fear, with a prevalence estimated between 183 and 226 persons per 1000 population. Dental fear was associated with fears of heights, flying, and enclosures. Respondents with multiple common fears other than fear of dentistry were more likely to delay or cancel dental appointments, report a longer period since their last visit to the dentist, and report poorer oral health and less satisfaction with oral appearance. Over 22 percent of the dentally fearful group reported two or more accompanying common fears.

Relatively little is known about the prevalence of dental fear in the context of common fears and phobias in the general population. In 1969 Agras and colleagues⁴ published the only U.S. community survey of multiple fears to include dentistry. The population of a small-to-medium-size Vermont city revealed an annual prevalence of all phobias to be 76.9/1000 persons. Of these, 74.7 cases were considered mildly disabling and 2.2 cases severely disabling. Dentistry ranked fourth among common fears and seventh among intense fears. Although not including dentistry specifically, the review by Weissman and Merikangas of the epidemiology of anxiety disorders cited an annual prevalence of 40 to 80/1000 anxious persons.⁵ They noted that generalized anxiety disorders (anxiety and worry about two or more life circumstances for 6 months or longer) are the most common, with panic disorders (periods of intense fears and discomfort with associated symptoms) being the least common. Anxiety disorders appeared to be more common in women and younger populations, and, in general, among the less educated. A co-morbidity between different anxiety disorders and between anxiety disorders and depression has been identified.

This study, part of a larger investigation of dental fears, provides epidemiological evidence concerning the frequency of common fears and their relationship to dental fears.

Controversy exists over whether fear manifested by patients in the dental office represents a larger anxiety-related syndrome, or whether dentally fearful patients are normal individuals who have developed an aversion and antipathy toward dental treatment. While population-based data is sparse, evidence from clinical populations suggests that patients with dental fear and other accompanying common fears are more difficult to manage and more likely to seek only symptomatic care than are individuals without accompanying fears.¹⁻³

METHODS

Subjects

Sample selection. Between April and August, 1986, residents of metropolitan Seattle were surveyed by telephone or by mail to determine the prevalence of dental fear, other common fears, and related factors. Employing a random digit dialing scheme, a listing of 1000 published and unpublished telephone numbers was obtained. When residences were contacted by telephone, respondents

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within each household were selected by asking the adult member with the most recent birthday to complete the interview. Because pretests determined that 40% of potential respondents could not be reached by telephone despite repeated attempts, a mail version of the survey was created and sent to a second sample of 1000 households using addresses compiled from all geographic areas of Seattle in an effort to include subjects of all races and levels of social class.

Demographic characteristics. A total of 1019 subjects completed interviews, 515 (68.9%) by telephone interview and 504 (52.1 percent) by mail. Some data were missing in completed questionnaires; sample sizes therefore varied slightly in different analyses. Overall, 43.5% of respondents were men, with a mean age of 42.7 years (SD = 17.0). The mean age for women was 45.3 years (SD = 19.0). Nearly one-half of study respondents were married. Eighty-five percent were white with the largest minority being Asian, representing 5.1% of the total sample. Native American Indians, blacks, and Hispanics were also included. Twenty-four percent of the study participants had completed high school; 41.0% had received post-graduate education. Family income ranged from under \$10,000 per year (15.2% of participants) to more than \$35,000 per year (27.5%). Among all respondents, 52.2% reported having dental insurance. The demographic characteristics of the combined sample did not differ significantly from those of the Seattle Standard Metropolitan Statistical Area population as a whole for 1980.

Survey Instruments

The telephone survey instrument was comprised of 88 close-ended questions on demographic characteristics, dental and other common fears, previous dental and medical experiences, and perceived current state of dental health. The mail version was similar to the phone survey, but some questions were formatted differently and presented as a booklet for ease of reading. Pretesting and follow-up with some subjects did not reveal any comprehension or vocabulary problems with the instrumentation.

Data Analysis

Demographic characteristics of the population and simple descriptive statistics for dental services utilization characteristics were obtained using the frequency procedure of the Statistical Analysis System⁶ for counts of categorical variables and the means procedure for continuous variables. Significance of findings was assessed using the χ^2 goodness-of-fit test for frequency counts and the Student's *t*-test for the means of continuous variables.

A subject was categorized as having a high level of

dental fear if he/she reported being "somewhat afraid," "very afraid," or "terrified" of dental treatment. The "somewhat afraid" group was placed in the high fear category because previous population-based research using this question has shown this group to be one standard deviation above the norm.⁷ Moreover, our experience at the Dental Fears Research Clinic has shown this group to exhibit dental services utilization characteristics (cancellation, avoidance, and management problems) that would categorize them as high-fear individuals.³ Individuals in the "not at all afraid" and "a little afraid" groups were placed into the low fear category.

Other common fears surveyed included fear of heights, injury, death, illness, flying, enclosures, traveling alone, storms, and being alone. These fears were chosen from those previously identified by Agras and colleagues.⁴ A severe single fear was determined by a positive response to being "very much" afraid or "terrified" (mail survey); and "very much (afraid) but I can deal with it" or "very much (afraid) and I can't deal with it" (phone survey) corresponding to Geer's severe level of fear.⁸ Intense level single fear was defined as a positive response to being "terrified" on the mail survey or "very much (afraid) and I can't handle it" on the phone survey. Agras and colleagues found this level of fear "disabling," providing evidence for the validity of this categorization.⁴ Prevalence of common fears was estimated for the entire sample and separately, by type of survey instrument.

Dental services utilization characteristics assessed included avoidance of appointment making and/or cancellation of dental visits; presence of at least one oral symptom (ie, toothache, bleeding/sore gums, difficulty chewing); time since last visit to the dentist; perceived state of oral health (ie, moderate number of dental problems), and satisfaction with appearance of teeth (ie, somewhat dissatisfied).

To determine if the presence of common fears was predictive of an individual's level of dental fear, unconditional stepwise logistic regression analysis was performed using high/low dental fear as the dichotomous outcome variable and the presence of one or more common fears as the dichotomous predictor variable, after adjusting for age and sex. Similarly, the implications of common fears on dental practice were explored employing separate stepwise logistic regression models using dichotomous measures of dental behavior or oral health as dependent variables and demographic variables, multiple common fears and perceived health variables as the predictor variables. Relevant odds ratios were computed by exponentiating the regression coefficient, and confidence intervals were estimated using the standard error of the mean. Two-sided *p*-values are reported.

The interrelationships between the specific fears were explored using cluster analysis, based on the VARCLUS

Table 1. Prevalence^a of Selected Fears Among Residents of Seattle, Washington, 1986

Type of Fear	Level of Fear				Total
	Very Little	Some	Very Much	Terrified	
Heights	223	193	112	52	580
Injury	262	198	62	3	525
Dentistry	298	131	43	30	502
Death	241	167	51	18	477
Illness	204	152	36	7	399
Enclosures	155	109	50	11	325
Flying	128	80	47	24	279
Traveling alone	122	66	21	5	214
Storms	114	57	27	8	206
Being alone	113	55	19	6	193

^a Number of category/1000 population.

procedures of the Statistical Analysis System.⁶ This procedure was used to perform hierarchical clustering of the fear variables based on a matrix of Pearson correlation coefficients in which all the fear variables were treated as being equally important. The clusters were chosen to maximize the variation accounted for by the first principal component of each cluster. The amount of variation explained within each cluster was computed by averaging the amount of variation explained by each variable within its cluster. A high value for the intraclass correlation would signify that the fears within the cluster are highly correlated to each other. A low correlation between clusters, estimated by averaging the amount of variation explained by a fear with respect to fear in another cluster, would signify well separated clusters.

RESULTS

Prevalence of Fears

For the common fears surveyed, among those reporting any level of fear (Table 1) the prevalence, in descending order, was: heights (580 fearful/1000 population); injury (525/1000); dentistry (502/1000); death (477/1000); illness (399/1000); enclosures (325/1000); flying (279/1000); traveling alone (214/1000); storms (206/1000); and being alone (193/1000).

Severe fears. Although the pattern of results was similar, the absolute results of the two survey instruments differed; therefore, results are presented separately by survey instrument (Figure 1). For the mail survey the prevalence of severe fears is given in descending order: dentistry (226 persons/1000 population); heights (112/1000); death (70/1000); injury (46/1000); flying (41/1000); enclosures (39/1000); and illness (38/1000). Similarly, in the telephone survey, heights (211/1000) and dentistry (183/1000) were the most prevalent common

fears, followed by flying (98/1000); injury (83/1000); enclosures (80/1000); death (67/1000), and illness (46/1000). At high levels of fear the prevalence of multiple fears was: 1-2 fears (250/1000); 3-4 fears (44/1000); 5-6 fears (11/1000); and 7 or more (10/1000).

Table 2 shows the frequency of fears in population subgroups. Women were 2.4 times more likely to report multiple fears than men ($p < 0.001$). Non-whites reported more fear than did whites (prevalence odds ratio [POR] = 1.5, $p = 0.043$). Individuals with family incomes greater than \$20,000 per year were 1.4 times more likely to report multiple fears than were families with lower incomes ($p = 0.01$). Overall, there were no major differences in frequency of multiple fears among different age groups.

Relationship Between Common Fears and Fear of the Dentist

Mail and telephone forms were not identical and respondents reported different levels of fear intensity and fear-related behaviors; therefore results were examined separately. In both survey forms, subjects with one or more common fears were more likely to report high levels of dental fear. In the mail survey population, subjects with common fears were 3.2 times more likely to report high dental fear ($p < 0.001$). Among telephone survey respondents those reporting intense levels of one or more common fears were 2.2 times more likely to experience high levels of dental fear ($p = 0.03$). Table 3 gives the mail survey results. Overall, 22.4% (48/214) of high dental fear respondents reported two or more common fears in addition to their high dental fear, compared to 11.2% (90/805) of the low dental fear group.

The results shown in Table 4 demonstrate that, for the combined surveys, after adjusting for race, sex, income, and age, subjects with one or more common fears were more likely than subjects with no common fears to avoid

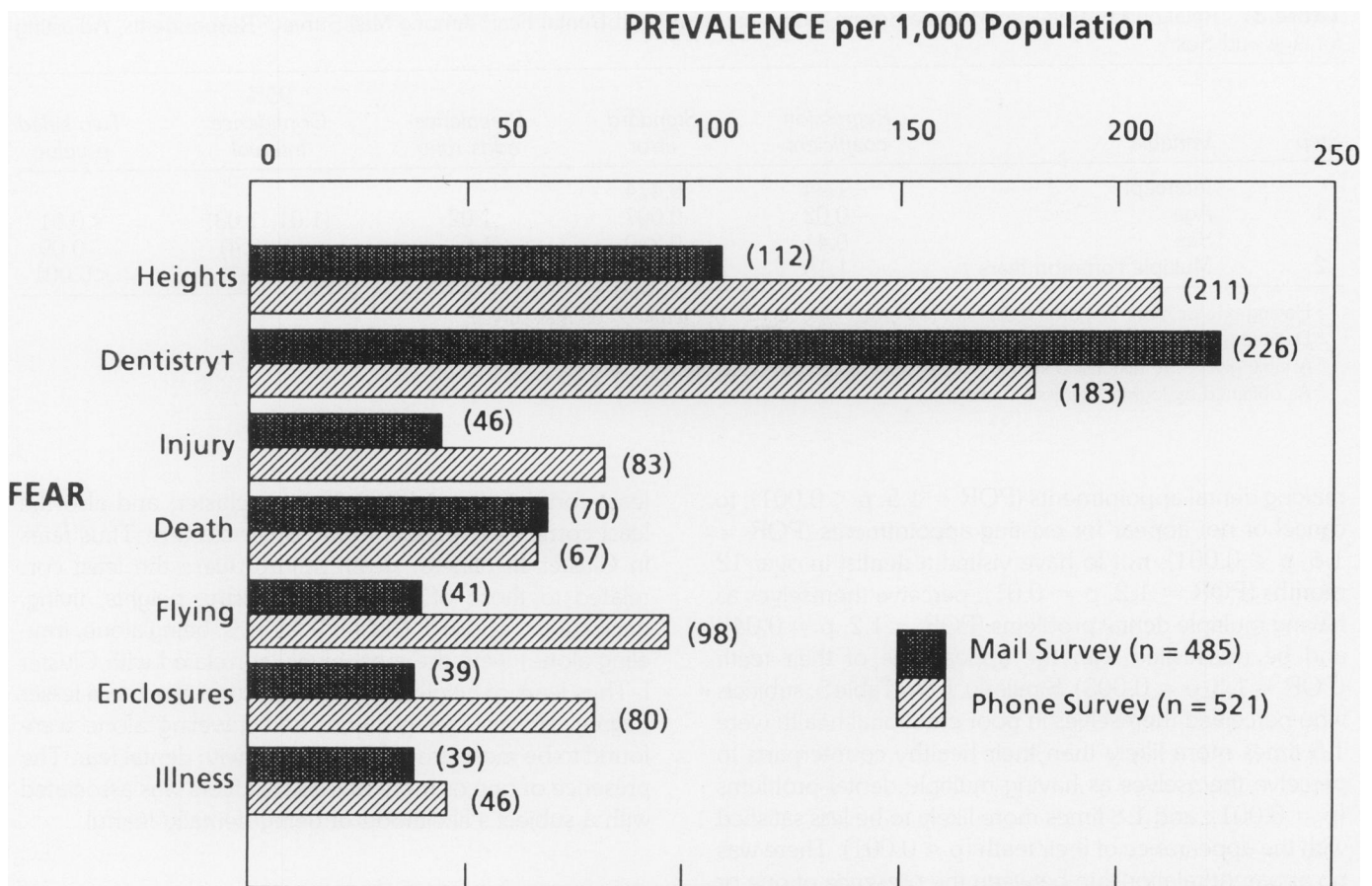


Figure 1. Survey instrument-specific prevalences of the most commonly reported fears for high fear level, defined as having given a positive response to one of the following: “very much afraid” or “terrified” (mail survey); “very much afraid, but I can deal with it” or “very much afraid and I can’t deal with it” (phone survey). †Includes the category “some fear.”

Table 2. Frequency of Multiple Severe Fears^a by Sex, Race, Income Level, and Age Group Among Residents of Seattle, Washington, 1986

Residents with ≥ 1 fears (n) (a)	Residents interviewed (n) (a + b)	Prevalence (%) (a/a + b)	Residents with ≥ 1 fears (n) (c)	Residents interviewed (n) (c + d)	Prevalence (%) (c/c + d)	POR $\left(\frac{a/b}{c/d}\right)$	95% confidence interval	Two-sided p-value
Women			Men					
219	569	38.5	91	443	20.5	2.4	(1.8-3.2)	<0.001
	Non-white ^b			White				
51	132	38.6	256	865	29.4	1.5	(1.0-2.2)	0.04
	Low Income ^c			High Income				
166	480	34.9	146	539	27.1	1.5	(1.1-1.9)	0.01

POR = Prevalence odds ratio.

^a Defined as “very much” afraid or “terrified” of one or more of the following: heights, injury, death, dentistry, illness, enclosures, flying, traveling alone, storms, being alone.

^b Asians, black, hispanic or North American Indian.

^c Family income \leq \$20,000.

Table 3. Relationship Between Multiple Severe Common Fears^a and Dental Fear^b Among Mail Survey^c Respondents, Adjusting for Age and Sex^d

Step	Variable	Regression coefficient	Standard error	Prevalence odds ratio	95% Confidence interval	Two-sided p-value
	Intercept	-1.24	0.474			
1	Age	-0.02	0.007	1.02	(1.01, 1.03)	<0.01
	Sex	0.41	0.239	1.5	(0.9, 2.4)	0.09
2	Multiple common fears	1.15	0.244	3.2	(2.0, 5.1)	<0.001

^a Having one or more common fears with response "very afraid" or "terrified" on mail survey.

^b Defined as "somewhat afraid," "very much afraid," or "terrified" of dental treatment.

^c A table giving the telephone survey results is available from Louis Fiset.

^d As obtained by logistic regression analysis.

making dental appointments (POR = 1.5, $p < 0.001$), to cancel or not appear for existing appointments (POR = 1.6, $p < 0.001$), not to have visited a dentist in over 12 months (POR = 1.2, $p = 0.01$), perceive themselves as having multiple dental problems (POR = 1.2, $p = 0.04$), and be dissatisfied with the appearance of their teeth (POR = 1.3, $p = 0.003$). Similarly, from Table 5, subjects who perceived themselves in poor emotional health were 1.5 times more likely than their healthy counterparts to perceive themselves as having multiple dental problems ($p = 0.001$), and 1.8 times more likely to be less satisfied with the appearance of their teeth ($p < 0.001$). There was no apparent relationship between the presence of one or more common fears and the presence of oral symptoms during the previous 12 months. Similar results were obtained when performing separate analyses for mail and phone subjects.

The results of the cluster analysis for dental and non-dental fears are shown in Figure 2. Three distinct clusters were generated. Dental fear clustered most strongly with fear of heights, flying, and enclosures. Fear of storms, being alone, and traveling alone clustered separately, as did fear of illness, death, and injury. Dental fear was the

least correlated variable to its own cluster, and also the least correlated variable to the other clusters. Thus fears in Cluster III (illness, death, injury) were the least correlated to those of Cluster I (dentistry, heights, flying, enclosures). Those in Cluster II (storms, being alone, traveling alone) were the most highly correlated with Cluster I. Thus fears of heights, flying, enclosures, and, to a lesser degree, storms, being alone, and traveling alone were found to be most strongly associated with dental fear. The presence of one or more of these six fears was associated with a subject's likelihood of being dentally fearful.

DISCUSSION

Previous reports have cited the very high prevalence of dental fear in Seattle.⁷ Moreover, they have shown that most dental fears are acquired in childhood and adolescence and, unlike many simple childhood phobias, these fears persist into adulthood. This paper reports fear of the dentist to be associated with other common fears. Dentistry and heights represent the most prevalent fears, with dental fear being associated with fears of flying, en-

Table 4. Relationships Between Multiple Common Fears^a and Dental Avoidance Behavior/Perceived Oral Health Among Seattle Residents, Adjusting for Demographic Characteristics^{b,c}

Variable (Dental)	Regression coefficient	Standard error	Prevalence odds ratio	95% Confidence interval	Two-sided p-value
Delay in making dental appointments	0.38	0.007	1.5	(1.3, 1.7)	<0.001
Cancel existing appointments	0.49	0.11	1.6	(1.3, 2.0)	<0.001
Time since last dental visit	0.18	0.07	1.2	(1.0, 1.4)	0.01
Perceived dental health	0.16	0.08	1.2	(1.0, 1.4)	0.04
Satisfaction with appearance of teeth	0.24	0.08	1.8	(1.3, 2.3)	0.003

^a Having one or more common fears with response "very afraid" and "terrified" on mail survey and "very much afraid and I can deal with it" or "very much afraid and I can't deal with it" on the phone survey.

^b Race, age, income, and sex.

^c As obtained by separate logistic regression analyses.

Table 5. Relationship Between Self-reported Emotional Health and Perceived Oral Health Among Seattle Residents, Adjusting for Demographic Characteristics^{a,b}

Variable	Regression coefficient	Standard error	Prevalence odds ratio	95% confidence interval	Two-sided p-value
Perceived dental health	0.42	0.13	1.5	(1.3, 2.0)	0.04
Satisfaction with appearance of teeth	0.57	0.14	1.8	(1.3, 2.3)	0.003

^a Race, age, income and sex.

^b As obtained by separate logistic regression analyses.

closed spaces, and heights. These findings are similar to those presented by Agras and colleagues in 1969⁴ in that heights and injury are among the most common fears. However, in contrast to the Vermont study, dentistry and flying fears have risen in prevalence. This may be because exposure to both has increased markedly in the population. In addition, the results of the cluster analysis differ from the prevalence by age patterns presented in the earlier work. Fear of dentists was suggested to follow the pattern of fears of darkness and strangers. However, no direct comparison can really be made because the analytic methods are rather different.

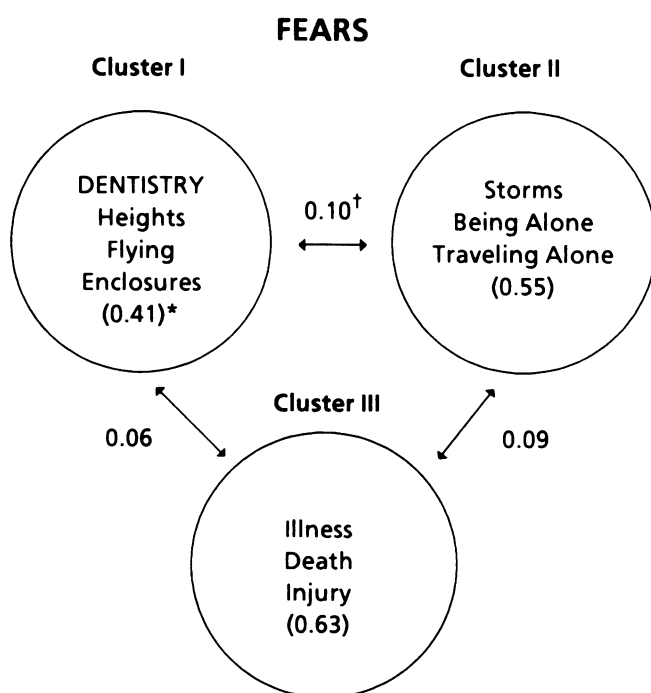
We have chosen to classify dental fear differently than common fears in these analyses. The rationale for the classification is rooted in previous work on the validity of

the questions. Other classifications were evaluated and the results are qualitatively similar.

Nevertheless, important implications of these findings exist for both research and public health practice. First, few data currently exist concerning the acquisition, prevention, or treatment of dental fear in older children. Yet, it appears these young people, especially those with other common fears, are at increased risk of sustaining dental fears. We believe a high priority should be placed on epidemiologic studies designed to identify the origins and prevalence of these multiple fears, with an attempt to understand their natural histories. Such research should study the family as well as the individual.⁵ Such studies could generate strategies to test interventions designed to prevent development of new fears, as well as to ameliorate acquired fears consistent with developmental maturity. Second, investigations of dental fear prevention and treatment should include measures of other common fears and of psychological well-being. Our research suggests that common fears do not occur randomly and thus are probably a source of considerable unexplained variation and imprecise estimates in many studies of fear, anxiety, and pain. This is especially true for research involving pharmacologic agents where, until recently, almost no measures of fears were collected. Third, the relationship between the prevalence of common fears and dental utilization behaviors confirms our clinical impression that patients with multiple fears appear difficult for the community dentist to treat. Such individuals frequently postpone or cancel visits and are more likely to allow their fears to interfere with treatment, resulting in visits primarily for symptomatic care. They are also more likely to report greater dissatisfaction with their appearance and state of oral health. These findings confirm earlier work by Berggren.⁹

Fortunately, the data reveal that nearly 80% of individuals reporting high dental fear fail to report more than one other common fear. Thus, it appears that most dentally fearful people are normal individuals with a simple aversion to dental treatment. On the other hand, one person among every five dentally fearful people reports two or more accompanying common fears, findings that may have important implications for clinical practice.

Figure 2. Clustering of self-reported dental fear and other common fears. *Denotes correlation within an individual cluster. †Denotes correlation between individual clusters.



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