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Dental fear among population aged 30 years and older in Finland

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Abstract

Objective. The aim of the study was to examine how the percentage of subjects reporting dental fear varied in accordance with age, gender, level of educational attainment, and marital status in a nationally representative sample of the adult population in Finland. **Material and Methods.** The two-stage stratified cluster sample ($n=8028$) represented the population aged 30 years or older living in Finland. Of this nationwide sample, 88% participated. Dental fear was measured with the question: “How afraid are you of visiting a dentist?” The reply alternatives were: “Not at all”, “Somewhat”, and “Very much”. Age-specific multiple logistic regression analyses were used to explore the associations between dental fear and age, gender, marital status, and level of educational attainment. **Results.** Overall prevalence of being somewhat or very afraid of visiting a dentist among adults in Finland was high (37%), particularly among 30 to 34-year-olds (47%). Among men and women of different ages, 5% to 19% were very afraid and 16% to 59% at least somewhat afraid of visiting a dentist. Female gender was the best determinant of dental fear. Those with higher educational attainment were about half as likely to be very much afraid of dentistry compared to those with secondary educational attainment. Among the youngest age group, non-singles were more likely to report being very much afraid of dentistry than single subjects. **Conclusions.** The fairly high prevalence of reported dental fear among adults, especially in the youngest age group, presents a challenge to dental personnel in Finland.

Key Words: Adults, dental anxiety, prevalence

Introduction

Dental fear, anxiety, and phobia have consistently been reported as widespread problems that persist despite the technological advances that have made dentistry less painful and less uncomfortable [1,2]. Of adults, 4% to 20% report at least some level of dental fear [2–12]. However, these large studies have covered only specific age groups or limited areas [12,13], and nationally representative estimates of the prevalence of adult dental fear have not been reported for Finland and other countries. An exception is Australia [10]. Women consistently report dental fear more often than men do [3–5,7,11–13]. In general, dental fear has been reported to be more common among younger than older adults [4,6,8,9,14], but in some studies younger adults (15 to 25-year-olds) less often reported dental fear than older subjects did [3,5,7]. Severe dental fear has been reported to be more

prevalent among subjects with lower educational attainment or those who are single than among those with higher educational attainment or non-singles [7,9,11,15]. However, these associations have not been found in all studies [3,5,7], and in many studies they have not been evaluated systematically. The wide variation in the prevalence of dental fear could reflect real differences between populations or population groups, or could be the consequence of methodological differences. Studies may have measured varying aspects of fear related to dental treatment, such as dental fear, anxiety, or phobia [2,16]. In this article, we take the expression “dental fear” to cover all these aspects. Use of subsamples of populations or just different measures or cut-off points also makes comparisons between study results difficult [2,16]. Even though associations between dental fear and demographic factors such as gender have been confirmed in many studies, it remains unclear, for example, whether the generally low

prevalence of dental fear among older adults is due to a cohort effect or is a reflection of declining fear with increasing age [17]. In the present study we examined how the percentage of subjects reporting dental fear varied depending on age, gender, level of educational attainment, and marital status in a nationally representative sample of adults aged 30 years and older living in Finland.

Material and methods

This cross-sectional study is part of the comprehensive nationwide Health 2000 survey in Finland, carried out in 2000–2001 by the National Public Health Institute. Permission for the study was given by the ethics committees of the University Hospital Region of Helsinki and Surroundings and the National Public Health Institute. The two-stage stratified cluster sample ($n=8028$) represented the population aged 30 years and older living in Finland. Detailed information on the sampling method has been published elsewhere [18].

A total of 51 subjects died before the interview, making the final sample size 7977. These subjects were contacted by trained interviewers from the Statistical Centre of Finland and invited to participate. In total, 6986 were interviewed at their home and the rest at their workplace or at a hospital or institution of permanent residence. The titles and subtitles describing the contents of the interview have been presented elsewhere [18].

Dental fear was assessed in the interview by the following single question: “How afraid are you of visiting a dentist?” with the reply alternatives being “Not at all”, “Somewhat”, and “Very much”. Of the subjects, 6857 responded to the question. For the present study, a subject’s background was described by age, gender, marital status, and level of educational attainment. Age was rounded off to the nearest full year. Based on the age-specific distribution of the subjects by dental fear, ages were categorized into 30 to 34 (743 subjects), 35 to 49 (2396 subjects), 50 to 64 (1999 subjects), and 65+ (1719 subjects). The question about marital status gave five alternatives, of which “Divorced or separated”, “Widowed”, and “Single” were later combined into the category single, and “Married” or “Cohabiting” into the category non-single. Level of educational attainment was assessed using information on formal schooling and vocational training. For the analyses, level of educational attainment was categorized into three levels: basic, secondary, and higher educational attainment. Those with no formal vocational training or matriculation examination were classified as having basic educational attainment; those who had completed vocational training or matriculation examination were considered as having secondary educational attainment; higher educational attainment included degrees from

higher vocational institutions, polytechnics, and universities.

Statistical significances of the differences among subgroups were first evaluated using chi-square tests. Multiple logistic regression analyses were performed to adjust for the simultaneous effects of the independent variables on dental fear. Dental fear was included as the dependent variable in two models using the following thresholds: not at all afraid versus somewhat or very much afraid, and not at all or somewhat afraid versus very much afraid. The independent variables included in the first stage of modeling were categorized as follows: gender (0 = man, 1 = woman), marital status (0 = single, 1 = non-single), age (three dummy variables), and level of educational attainment (two dummy variables using secondary educational attainment as reference). First-order interactions were considered in addition to the main effects. The models were derived using the manual backward elimination method. In the initial models, statistically significant interaction coefficients ($p < 0.05$) were observed, indicating that age modified the effect of gender and marital status on dental fear. Thus, final models were derived separately for each age group. To take into account the two-stage cluster sampling method, we used statistical methods for handling correlated data collected with unequal sampling probabilities. The parameter estimates and confidence intervals were adjusted in the analyses using the procedures `svytab` and `svylogit` of STATA, version 8.0 [19].

Results

The mean age for all subjects was 52.5 years (SD 14.6), median 51.0 years. For men (3090), the mean age was 51.1 years (SD 13.7) and median 50.0 years, and for women (3767) 53.8 years (SD 15.2) and 52.0 years, respectively.

Forty-three percent of the women and 29% of the men reported being somewhat or very much afraid of visiting a dentist (Figure 1). In all age groups,

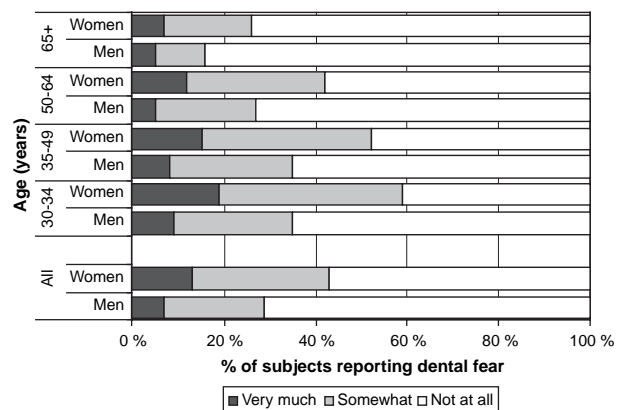


Figure 1. Percentage of adult subjects aged 30 years and older reporting dental fear, according to age and gender in Finland.

women more often reported dental fear than men did. The differences in accordance with both age and gender were statistically significant at the $p < 0.001$ level. Both men and women in older age groups reported dental fear less often than the younger subjects did. Of the 30 to 34-year-olds, 59% of the women and 35% of the men reported being somewhat or very afraid of visiting a dentist. Among the oldest age group the corresponding percentages were 26% and 16%, respectively.

Non-single women more often reported being somewhat or very afraid of visiting a dentist than single women did (Table I). Among men, no difference was observed between single and non-single subjects. Among both women and men, those with basic educational attainment less often reported being somewhat or very afraid of visiting a dentist than did those with secondary or higher educational attainment (Table II). Among 35 to 49-year-old men, those with secondary educational attainment less often reported being somewhat or very afraid of visiting a dentist compared with those who had basic or higher educational attainment (Table II).

When looking at the independent effects of gender, education, and marital status, gender showed the strongest impact on dental fear. Among 65+-year-olds, none of these variables was related to dental fear. Women below 65 years of age were more than twice as likely as men to be very much afraid of visiting a dentist (Table III). When a less strict threshold of dental fear, i.e. being somewhat or very much afraid of visiting a dentist, was used, among the various age groups the effect of gender remained strongest. Women were about twice as likely as men to be afraid (OR 2.7, 1.9, 2.0, and 1.9 ($p < 0.001$)).

for the 30–34, 35–49, 50–64, and 65+ years old groups, respectively). The impact of marital status on dental fear was slight (Table III), being observed only in 30 to 34-year-olds, among whom non-singles were almost twice as likely to be very much afraid of visiting a dentist compared to singles.

The impact of education differed among different age groups and also when different thresholds of dental fear were used. In general, those with higher educational attainment were about half as likely to be very much afraid of visiting a dentist compared to those with secondary educational attainment, except among 65+-year-olds (Table III). On the threshold of being somewhat or very much afraid of visiting a dentist, the impact of education was observed only among the 35 to 49 and 65+ year-olds. Among the first group, those with basic educational attainment were more likely to be afraid compared to those with secondary education (OR 1.3, 95% CI 1.1–1.7; $p = 0.02$). Among the oldest age group, subjects with higher educational attainment were less likely to be afraid than those with secondary educational attainment (OR 0.5, 95% CI 0.3–0.9; $p = 0.03$).

Discussion

In this nationally representative sample of the adult population living in Finland, every second woman and every third man reported being at least somewhat afraid of visiting a dentist. The response rate of this national survey was high. Information about dental fear was collected in the home in a situation void of any connection with a dentist or dental visit. Thus, those who may avoid visiting a dentist were also reached. The results can therefore be

Table I. Percentage of subjects reporting dental fear among adult men ($n = 3089$) and women ($n = 3767$) according to marital status in Finland

Gender and marital status	Fear	Age group (years)				All
		30–34	35–49	50–64	65+	
Men						
Non-single	Very much	9	7	4	5	6
	Somewhat	26	29	22	12	23
	Not at all	65	64	74	83	71
Single	Very much	8	10	8	4	8
	Somewhat	26	23	22	9	21
	Not at all	66	67	70	87	71
		$p = 0.854$	$p = 0.106$	$p = 0.070$	$p = 0.514$	$p = 0.113$
Women						
Non-single	Very much	21	14	12	6	13
	Somewhat	39	38	29	22	33
	Not at all	40	48	59	72	54
Single	Very much	12	16	13	8	11
	Somewhat	46	33	32	18	27
	Not at all	42	51	55	74	62
		$p = 0.221$	$p = 0.222$	$p = 0.549$	$p = 0.224$	$p < 0.001$

P-values for chi-squared test for differences in dental fear according to marital status (non-single = married or cohabiting; single = single, widow or divorced).

Table II. Percentage of subjects reporting dental fear among adult men ($n=3087$) and women ($n=3763$) according to level of educational attainment in Finland

	Fear	Age group (years)				All
		30–34	35–49	50–64	65+	
Men						
Basic educational attainment	Very much	10	12	6	5	7
	Somewhat	14	29	22	11	20
	Not at all	76	59	72	84	73
Secondary educational attainment	Very much	12	7	6	7	7
	Somewhat	25	25	24	16	24
	Not at all	63	68	70	77	69
Higher educational attainment	Very much	5	6	3	2	5
	Somewhat	31	31	19	7	25
	Not at all	64	63	78	91	70
		$p=0.055$	$p=0.013$	$p=0.207$	$p=0.125$	$p=0.003$
Women						
Basic educational attainment	Very much	28	18	14	7	12
	Somewhat	36	37	30	20	27
	Not at all	36	45	56	73	61
Secondary educational attainment	Very much	24	16	14	6	15
	Somewhat	35	36	28	18	31
	Not at all	41	48	58	76	54
Higher educational attainment	Very much	15	12	9	5	11
	Somewhat	44	37	30	14	35
	Not at all	41	51	61	81	54
		$p=0.097$	$p=0.135$	$p=0.345$	$p=0.341$	$p<0.001$

P-values for chi-squared test for differences in dental fear according to level of educational attainment.

generalized to the population aged 30 years and older living in Finland. The high percentage, i.e. 43% of the women and 29% of the men, who reported at least some dental fear presents a challenge to oral health personnel.

In our study, women were more likely to report dental fear than men were, as has been reported in

previous studies [3–5,7,11–13]. However, this association was not seen among 65+ year-olds, nor was it found among 50 to 89-year-olds in Toronto [6]. Among the oldest subjects, neither education nor marital status was associated with dental fear.

In this study, education was included as two dummy variables because the association between

Table III. Relationship between being very much afraid of visiting a dentist and gender, marital status, and education among adults in Finland ($n=6849$) at different ages as evaluated by a logistic regression model

Age group	Independent variables	β	S.E.	OR	95% CI	<i>p</i>
30–34 years	Marital status (1 = non-single, 0 = single)	0.531	0.266	1.7	1.0–2.9	0.046
	Gender (1 = women, 0 = men)	0.990	0.235	2.7	1.7–4.3	<0.001
	Education dummy 1 (1 = basic, 0 = secondary)	0.109	0.333	1.1	0.6–2.1	0.743
	Education dummy 2 (1 = higher, 0 = secondary)	–0.742	0.230	0.5	0.3–0.7	0.001
Goodness-of-fit test $F(4, 405) = 7.57, p < 0.001$						
35–49 years	Marital status (1 = non-single, 0 = single)	–0.155	0.148	0.9	0.6–1.1	0.295
	Gender (1 = women, 0 = men)	0.756	0.124	2.1	1.7–2.7	<0.001
	Education dummy 1 (1 = basic, 0 = secondary)	0.345	0.169	1.4	1.0–2.0	0.042
	Education dummy 2 (1 = higher, 0 = secondary)	–0.256	0.160	0.8	0.6–1.1	0.108
Goodness-of-fit test $F(4, 967) = 12.72, p < 0.001$						
50–64 years	Marital status (1 = non-single, 0 = single)	–0.266	0.162	0.8	0.6–1.1	0.102
	Gender (1 = women, 0 = men)	0.962	0.168	2.6	1.9–3.6	<0.001
	Education dummy 1 (1 = basic, 0 = secondary)	–0.068	0.181	0.9	0.7–1.3	0.707
	Education dummy 2 (1 = higher, 0 = secondary)	–0.610	0.230	0.5	0.3–0.9	0.008
Goodness-of-fit test $F(4, 810) = 11.42, p < 0.001$						
65+ years	Marital status (1 = non-single, 0 = single)	–0.107	0.224	0.9	0.6–1.4	0.633
	Gender (1 = women, 0 = men)	0.324	0.252	1.4	0.8–2.3	0.198
	Education dummy 1 (1 = basic, 0 = secondary)	–0.087	0.267	0.9	0.5–1.5	0.743
	Education dummy 2 (1 = higher, 0 = secondary)	–0.804	0.486	0.4	0.2–1.2	0.099
Goodness-of-fit test $F(4, 631) = 1.68, p = 0.154$						

education and dental fear was u-shaped, not linear. When the impact of education on dental fear is interpreted, one has to consider the differences in the distribution of education according to age. In younger age groups, most subjects had at least secondary educational attainment, while among the oldest age groups most subjects had only basic educational attainment [18]. This difference in education level according to age may also partly explain the difference in the reported fear of visiting a dentist among different age groups. Younger subjects had higher educational attainment and, owing to their greater knowledge, they may be more aware of what there is to be afraid of in dentistry.

The impact of marital status on dental fear in the youngest age group was modest. In Finland, non-single subjects were more likely to report dental fear, while in Iceland divorced or widowed individuals were reported to be most at risk [11]. In the other age groups, the impacts of education and marital status were not significant. As the sample size of this representative study was large and the response rate was high, if true associations had existed in this population they would have been detected.

In comparisons with previous results, one must take into account the fact that use of a single-item question has been shown to result in a higher prevalence than multi-item measures have [16]. On the other hand, a single-item question has proved to be valid and reliable in the adult Norwegian population [20]. In the present comprehensive national survey on health and functional capacity, only limited space was available for dental fear and multi-item indices could not be used. The percentages of subjects reporting dental fear were, especially among the youngest age group, higher than those reported in studies conducted in Seattle [3] and in Denmark [9], where 20% and 10% of the subjects, respectively, reported dental fear measured with a single-item question. On the other hand, the percentages of subjects reporting dental fear were similar to the results from Iceland [21], especially the percentages of subjects who were not at all anxious and also those for the age effect. The validity of the single question is also sufficient, as it could discriminate between genders and level of educational attainment when using the threshold "very much afraid". However, further studies are needed examining the concordance between this single question and multi-item measures.

The high percentage of subjects reporting dental fear is a challenge to oral health services, because dental anxiety has been shown to relate positively with irregular dental attendance [3]. Oral health personnel are likely to meet several fearful dental patients daily, and they have to take patients' fear seriously, however slight it may be. As the other variables studied, in addition to age and gender,

were not related to dental fear, dental personnel should consider any patient to be afraid of dentistry and take this into account during treatment. Especially challenging are the youngest subjects, among whom the percentage of subjects reporting dental fear was highest. The 30 to 34-year-olds have benefited since childhood from free comprehensive, preventively oriented oral health services, including annual check-ups. They thus have a history of visiting a dentist regularly but still report fear more often than their seniors do. Their dental fear calls for improvement in the quality of oral care – especially for increased communication skills, which have been reported to be moderate among Finnish oral health personnel [22–24]. This, in turn, could lead to improved satisfaction of both patient and dentist and even improve the oral habits and oral health of patients [13,25,26]. The fairly high prevalence of reported dental fear among adults, especially in the youngest age group, presents a challenge to dental personnel in Finland.

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