Acta Odontologica Scandinavica, 2011; 69: 243–247

informa
healthcare

ORIGINAL ARTICLE

Dental fear and alexithymia among adults in Finland

VESA POHJOLA[1], AINO K. MATTILA[2,3], MATTI JOUKAMAA[2,3,4] & SATU LAHTI[1,5]

[1]*Department of Community Dentistry, Institute of Dentistry, University of Oulu, Oulu, Finland,* [2]*Tampere School of Public Health, University of Tampere, Tampere, Finland,* [3]*Department of Psychiatry, Tampere University Hospital, Tampere, Finland,* [4]*National Institute for Welfare and Health (THL), Helsinki, Finland, and* [5]*Oral and Maxillo-Facial Department, Oulu University Hospital, Oulu, Finland*

Abstract

Objectives. The aim of this study was to investigate the association between dental fear and alexithymia in a nationally representative adult population sample, controlling for age, gender, education and marital status as well as depressive and anxiety disorders. An additional aim was to evaluate whether gender modified this association. ***Material and methods.*** The two-stage stratified cluster sample (n = 8028) represented the Finnish population aged 30 years and older. Participants (n = 5241) answered the question 'How afraid are you of visiting a dentist?' They also filled out the 20-Item Toronto Alexithymia Scale (TAS-20), which included three sub-scales, i.e. difficulties in identifying feelings (DIF), difficulties in describing feelings (DDF) and externally oriented thinking (EOT). Anxiety and depressive disorders were assessed with a standardized structured psychiatric interview according to DSM-IV criteria. To evaluate the association between dental fear and alexithymia, multiple logistic regression analyses were performed, adjusting simultaneously for the effects of possible confounding variables. ***Results.*** Gender modified the association between dental fear and alexithymia. Among women, those reporting higher scores for TAS-20, DIF and EOT sub-scale scores were more likely to have high dental fear than were those reporting lower scores. Among men no such association was observed. Those participants who reported high DDF sub-scale scores were more likely to have high dental fear than were those reporting lower scores. ***Conclusions.*** Alexithymics are more likely to have high dental fear than non-alexithymics are. The findings support the suggestion that some people with dental fear may have internal personality vulnerability to anxiety disorders.

Key Words: *Alexithymia, anxiety disorder, dental fear, depressive disorder*

Introduction

Dental fear has been suggested to have exogenous and endogenous components [1]. The endogenous components refer to dental fear as part of generalized anxiety symptoms involving multiple phobias and psychiatric diagnoses [2–4]. Certain psychological constructs or personality traits [5,6] such as alexithymia [7] may also be related to dental fear. Characteristic for alexithymia are: difficulties in identifying and describing one's own feelings and an unimaginative and externally oriented way of thinking. Alexithymia has been associated with anxiety disorders and other mental health disorders [8]. Since both dental fear and alexithymia have been associated with anxiety disorders and mental health problems, they are likely to be associated with each other.

In several studies, age and gender have been related to both dental fear and alexithymia. Women have reported dental fear more commonly than men have [9–13], whereas men have more commonly been classified as alexithymic than women have [14]. In the most recent studies on the general population of Finnish adults, ~12% of men and 8% of women have been found to be highly alexithymic [15]. As far as we know, there is only one study in which the association between dental fear and alexithymia has been reported [7]. In that study, gender modified the association between dental fear and the difficulty of describing one's feelings. The sample consisted of

Correspondence: Satu Lahti, Department of Community Dentistry, PO Box 5281, FIN-90014 University of Oulu, Oulu, Finland. Fax: +358-8-5375560. E-mail: satu.lahti@oulu.fi

(Received 19 August 2010; accepted 9 December 2010)

ISSN 0001-6357 print/ISSN 1502-3850 online © 2011 Informa Healthcare
DOI: 10.3109/00016357.2011.554861

patients attending dental care [7]. Since people with high dental fear are likely to avoid dental treatment [12,13,16], the results of that study should be confirmed with a study using a sample representing the general population.

Our aim here was to study the association between dental fear and alexithymia in a nationally representative sample of the adult population, controlling for age, gender, education and marital status as well as depressive and anxiety disorders. An additional aim was to evaluate whether gender modified this association.

Materials and methods

This cross-sectional study is part of the comprehensive nationwide Health 2000 Survey, carried out in Finland in 2000–2001 by the National Institute for Health and Welfare (National Public Health Institute). Permission for the study was given by the ethics committees of the University Hospital Region of Helsinki and Surroundings and by the National Institute for Health and Welfare (National Public Health Institute). The two-stage stratified cluster sample (n = 8028) represented the Finnish population aged 30 years and older. Detailed information on the survey has been published elsewhere [17]. For the present study we included those participants who participated in a home interview, answered the question about dental fear and returned a self-administered questionnaire that included the Finnish or Swedish (the two official languages of Finland) version of the 20-Item Toronto Alexithymia Scale (TAS-20) completed in their mother tongue. The final sample consisted of 5421 participants (2472 men), 68% of the original sample.

Participants' background was described by age, gender, educational level and marital status. Level of education was assessed using information on formal schooling and vocational training. The question about marital status gave five alternatives: 'Divorced or separated', 'Widowed', 'Single', 'Married' or 'Cohabiting'. In the home interview, dental fear was covered by a single question: 'How afraid are you of visiting a dentist?' The alternatives for replying ('Not at all', 'Somewhat' and 'Very') were used as such.

Alexithymia was assessed using the TAS-20 questionnaire, which is the most widely used and presumably most carefully validated of the alexithymia measures [18–21]. The Finnish [22] as well as the Swedish [23] versions of the scale have been found to have satisfactory validity and reliability. The items in the TAS-20 are statements on a five-point Likert-scale ranging from 'strongly disagree' to 'strongly agree'. Items 4, 5, 10, 18 and 19 were reverse coded. The total score of the TAS-20 ranges from 20–100. According to the recommendation by the developers of the scale, the cut-off point for alexithymia was also used: subjects scoring 61 points or more were defined as alexithymic [24]. In addition, the TAS-20 consists of three sub-scales, which reflect the three main facets of the alexithymia construct. The first sub-scale assesses difficulties in identifying feelings (DIF) with seven items (score range 7–35) and the second sub-scale concerns difficulties in describing feelings (DDF) with five items (score range 5–25). The third sub-scale reflects externally oriented thinking (EOT) or pre-occupation with the details of external events with eight items (score range 8–40).

The psychiatric diagnostic tool was the computerized Munich version of the Composite International Diagnostic Interview (MCIDI) [25]. Using operationalized criteria for DSM-IV diagnose, this version gave the DSM-IV diagnoses for 12-month prevalence of depressive and anxiety disorders [26,27].

Statistics

Characteristics of the sample were described as percentages of participants with different levels of dental fear, anxiety and depressive disorders and prevalence of TAS-20 (those scoring 61 or higher = alexithymic) as well as mean age and TAS-20 total and sub-scale scores, also by gender. The statistical significances between genders were tested with chi-square test, t-test and ANOVA.

To evaluate the association between dental fear and alexithymia, multiple logistic regression analyses were performed, simultaneously adjusting for the effects of possible confounding variables. Dental fear was included as the dependent variable at a threshold of 'not at all' or 'somewhat afraid' vs 'very much afraid'. TAS-20 total and sub-scale scores were included as discrete variables and ORs were reported for 10-point increments. The possible confounding variables included were categorized as follows: gender (0 = man, 1 = woman), marital status (0 = single = 'Divorced or separated', 'Widowed' and 'Single', 1 = non-single = 'Married' or 'Cohabiting'), age (discrete) and level of educational attainment (categorized into three levels: basic, secondary and higher education) and depressive and anxiety disorder (0 = no diagnosis, 1 = 12 month diagnosis). In addition to the main effects, first-order interactions with gender were considered and the statistical significance was set at $p < 0.05$.

Results

Those classified as alexithymic did not report high dental fear more often than those classified as non-alexithymic (11.1% vs 9.2%, $p = 0.084$). Men were more commonly alexithymic than women were (12.0 vs 8.3 %, $p < 0.001$) and reported higher mean scores for alexithymia total and all other

sub-scales, except difficulty in identifying feelings. Women reported dental fear more often than men did (Table I) and this was also the case among alexithymic (13.9% vs 8.8%, $p = 0.031$) and non-alexithymic (12.1% vs 5.6%, $p < 0.001$) participants, respectively.

When unadjusted continuous alexithymia scores were examined, those reporting high dental fear had higher mean scores on DIF than did those with moderate or no fear. The association with TAS-20 total score as well as DDF and EOT sub-scales was not linear (Table II); those with no dental fear had higher mean scores for TAS-20 total and EOT sub-scale than those with moderate or high dental fear.

The logistic regression models showed that gender modified the association between dental fear and TAS-20 total score as well as DIF and EOT sub-scales when adjusted for age, education, marital status and depressive and anxiety disorders. Among women, those reporting higher scores for alexithymia total, DIF and EOT sub-scale scores were more likely to have high dental fear than those reporting lower scores. Among men, no such association was observed. Those participants who reported high DDF sub-scale scores were more likely to have high dental fear than were those reporting lower scores (Table III).

Discussion

Gender modified the association between dental fear and alexithymia. Those women with higher levels of alexithymia as well as difficulty in indentifying feelings and externally oriented thinking were more likely to have dental fear than women with lower scores when possible confounders were considered. Among men, no such association was observed. Among all participants, higher levels of difficulty of describing feelings were observed among those with dental fear.

The strengths of this study were a large nationally representative sample and high rates of participation in home interview and questionnaire surveys. The findings of this study can be generalized to the adult Finnish population aged 30 years and older. To measure dental fear, we used a single item that has been shown to be valid and reliable in the adult Finnish and Norwegian populations [28,29]. Dental fear was ascertained during a home interview, which might result in more valid estimation of dental fear than asking about it in connection with a clinical examination, in which those with high fear might not participate.

The adjusted associations between TAS-20 total and sub-scales scores were similar to those found in a previous study with a patient sample [7]. However, in the present study the gender modification was observed in alexithymia total and sub-scales of difficulty in identifying feelings and externally oriented thinking while in the previous study it was observed in the difficulty in describing feelings sub-scale. The differences in the results might be due to the fact that the previous study was done among a group of participants attending dental care where the number of men reporting high dental fear was lower. In addition, the significance of the effect modification found in this study was not strong for the DIF sub-scale, taking into account the large study sample.

When socio-demographics as well as depressive and anxiety disorders were controlled for, the association

Table I. Description of the participants according to their dental fear, depressive and anxiety disorders, age and alexithymia total and sub-scale scores among men and women.

	Men				Women					All			
Variable	*n*	%	*M*	SD	*n*	%	*M*	SD	*p*	*n*	%	*M*	SD
Fear									<0.001[a]				
very afraid	160	6.0			346	12.3				516	9.3		
somewhat afraid	621	23.4			988	31.5				1529	27.6		
not at all afraid	1878	70.6			1620	56.2				3489	63.1		
Depressive disorder	105	4.4			229	8.3			<0.001[a]	334	6.5		
Anxiety disorder	75	3.2			134	4.9			0.002[a]	209	4.1		
Age			50.4	13.1			51.9	14.0	<0.001[b]			51.2	13.6
TAS-20 total			47.8	10.2			43.8	10.9	<0.001[b]			45.7	10.7
Difficulty in identifying feelings			13.2	5.1			13.2	4.9	0.926[b]			13.2	5.0
Difficulty in describing feelings			12.4	3.8			11.0	3.8	<0.001[b]			11.7	3.9
Externally-oriented thinking			22.2	4.2			19.7	4.9	<0.001[b]			20.9	4.8

[a]chi-square tests.
[b]t-tests.

Table II. Mean alexithymia total and sub-scale scores and their standard deviations according to dental anxiety levels.

	TAS-20 total score		Difficulty in identifying feelings		Difficulty in describing feelings		Externally-oriented thinking	
Variable	*M*	SD	*M*	SD	*M*	SD	*M*	SD
Fear								
very afraid	45.7	11.7	13.6	5.4	11.6	3.8	20.4	4.9
somewhat afraid	45.2	10.5	13.3	5.0	11.6	3.9	20.3	4.6
not at all afraid	46.0	10.7	13.1	5.0	11.7	3.8	21.2	4.8
	$p = 0.045$		$p = 0.040$		$p = 0.525$		$p < 0.001$	

p-values for one-way ANOVA.

between dental fear and alexithymia was stronger than the bivariate association, especially among women. Those with high dental fear were more alexithymic than those with moderate or low fear. In previous studies, alexithymia has been shown to be associated with generalized anxiety disorder, panic disorder and social anxiety disorder [15]. It has also been suggested that some individuals with dental fear may have internal personality vulnerability to anxiety symptoms [4,30]. As alexithymia is associated with various anxiety disorders, it is only natural that it is also associated with dental fear. After the effect of anxiety and depression was controlled for, alexithymia was still positively associated with dental fear. Thus, the personality trait represented by alexithymia could be a risk factor for anxiety symptoms or specific fears. This supports the suggestion that dental fear and anxiety have endogenous components [1].

In conclusion, our results with a nationally representative sample broadens the previous finding that alexithymia is associated with dental fear [7] from individual patients also to the population level. In addition, our findings support the suggestion that dental fear has endogenous components [1] and that some individuals with dental fear may have internal personality vulnerability to anxiety disorders [4,30]. As to the clinical significance of alexithymia, those with alexithymia have been reported to have poorer treatment outcomes than non-alexithymics. For example, difficulties in identifying feelings may predict persistence of certain anxiety symptoms during the course of a treatment program [31]. This should be considered when treatment of patients with dental fear is planned, as not all fearful patients benefit from similar treatment for fear.

Table III. Results of separate logistic regression analyses for TAS-20 total and sub-scale scores (dental fear as dependent variable at threshold high vs moderate or no fear and adjusting for age, gender, attained level of education and marital status as well as anxiety and depressive disorders including gender interactions).

	OR	95% CI	*p*
TAS-20 total score			0.007
Among men	1.03	0.92–1.15	
Among women	1.36	1.14–1.61	
DIF sub-scale score			0.038
Among men	1.05	0.82–1.35	
Among women	1.60	1.15–2.21	
DDF sub-scale score	1.36	1.04–1.77	0.023*
EOT sub-scale score			0.017
Among men	0.95	0.74–1.23	
Among women	1.73	1.13–2.67	

DIF = difficulty in identifying feelings; DDF = difficulty in describing feelings; EOT = externally-oriented thinking.
OR for the 10-point difference in TAS-20 total and sub-scale scores; *p*-value for the interaction coefficient, except * for the main effect.

Acknowledgements

The present study is part of the Health 2000 Survey, organized by the National Institute for Health and Welfare (THL), the former Public Health Institute (KTL) of Finland (http://www.terveys2000.fi/indexe.html), and was partly supported by the Finnish Dental Society Apollonia and the Finnish Dental Association. A personal grant to V.P. by the Finnish Dental Society Apollonia is gratefully acknowledged.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

References

[1] Weiner AA, Sheehan DV. Etiology of dental anxiety: psychological trauma or CNS chemical imbalance? Gen Dent 1990; 38:39–43.
[2] Berggren U. General and specific fears in referred and self-referred adult patients with extreme dental anxiety. Behav Res Ther 1992;30:395–401.
[3] Roy-Byrne PP, Milgrom P, Khoon-Mei T, Weinstein P, Katon W. Psychopathology and psychiatric diagnosis in subjects with dental phobia. J Anxiety Disord 1994;8:19–31.
[4] Locker D, Poulton R, Thomson WM. Psychological disorders and dental anxiety in a young adult population. Community Dent Oral Epidemiol 2001;29:456–63.

[5] Armfield JM. A preliminary investigation of the relationship of dental fear to other specific fears, general fearfulness, disgust sensitivity and harm sensitivity. Community Dent Oral Epidemiol 2008;36:128–36.
[6] Thomson WM, Broadbent JM, Locker D, Poulton R. Trajectories of dental anxiety in a birth cohort. Community Dent Oral Epidemiol 2009;37:209–19.
[7] Viinikangas A, Lahti S, Tolvanen M, Freeman R, Humphris G, Joukamaa M. Dental anxiety and alexithymia: gender differences. Acta Odontol Scand 2009;67:13–18.
[8] Taylor GJ, Bagby RM. New trends in alexithymia research. Psychother Psychom 2004;3:68–77.
[9] Schuurs AHB, Duivenvoorden HJ, Thoden van Velzen SK, Verhage F, Eijkman MAJ, Makkes PC. Sociodemographic correlates of dental anxiety. Community Dent Oral Epidemiol 1985;13:212–15.
[10] Milgrom P, Fiset L, Melnick S, Weinstein P. The prevalence and practice management consequences of dental fear in a major US city. J Am Dent Assoc 1988;116:641–7.
[11] Stouthard ME, Hoogstraten J. Prevalence of dental anxiety in the Netherlands. Community Dent Oral Epidemiol 1990;18: 139–42.
[12] ter Horst G, de Wit CA. Review of behavioural research in dentistry 1987–1992: Dental anxiety, dentist-patient relationship, compliance and dental attendance. Int Dent J 1993;43: 265–78.
[13] Pohjola V, Lahti S, Vehkalahti MM, Tolvanen M, Hausen H. Association between dental fear and dental attendance among adults in Finland. Acta Odontol Scand 2007;65:224–30.
[14] Franz M, Popp K, Schaefer R, Sitte W, Schneider C, Hardt J, et al. Alexithymia in the German general population. Social Psychiatry Psychiatr Epidemiol 2008;43:54–62.
[15] Mattila AK, Salminen JK, Nummi T, Joukamaa M. Age is strongly associated with alexithymia in the general population. J Psychosom Res 2006;61:629–35.
[16] Abrahamsson KH, Berggren U, Hakeberg M, Carlsson SG. Phobic avoidance and regular dental care in fearful dental patients: a comparative study. Acta Odontol Scand 2001;9: 273–9.
[17] Aromaa A, Koskinen S, editors. Health and functional capacity in Finland. Baseline results of the Health 2000 Health Examination Survey. Helsinki: National Public Health Institute; 2004. Available online at: http://www.terveys2000.fi/julkaisut/baseline.pdf (accessed 1.2.2011).
[18] Bagby RM, Parker JDA, Taylor GJ. The twenty-item Toronto Alexithymia Scale-I. Item selection and cross-validation of the factor structure. J Psychosom Res 1994;38:23–32.
[19] Bagby RM, Taylor GJ, Parker JDA. The twenty-item Toronto Alexithymia Scale-II. Convergent, discriminant and concurrent validity. J Psychosom Res 1994;38:33–40.
[20] Parker JDA, Taylor GJ, Bagby RM. The 20-Item Toronto Alexithymia Scale III. Reliability and factorial validity in a community population. J Psychosom Res 2003;55: 269–75.
[21] Taylor GJ, Bagby RM, Parker JD. The 20-Item Toronto Alexithymia Scale IV. Reliability and factorial validity in different languages and cultures. J Psychosom Res 2003;55: 277–83.
[22] Joukamaa M, Miettunen J, Kokkonen P, Koskinen M, Julkunen J, Kauhanen J, et al. The Finnish version of the 20-item Toronto Alexithymia Scale. Nord J Psychiatr 2001; 55:123–7.
[23] Simonsson-Sarnecki M, Lundh LG, Torestad B, Bagby RM, Taylor GJ, Parker JDA. A Swedish translation of the 20-item Toronto Alexithymia Scale: cross-validation of the factor structure. Scand J Psychol 2000;41:25–30.
[24] Bagby M, Taylor G. Construct validation. In: Taylor GJ, Bagby RM, Parker JDA, editors. Disorders of affect regulation. Alexithymia in medical and psychiatric illness. Cambridge: Cambridge University Press; 1997. p 46–66.
[25] Wittchen H-U, Pfister H. DIA-X-Interviews: manual fur screening-verfahren und Interview; Interviewheft Langsschnittuntersuchung (DIA-X-Lifetime); Erganzungsheft (DIAX-Lifetime); Interviewheft Querschnittuntersuchung (DIA-X-12 Monate); 1997.
[26] Wittchen H-U, Reed V, Kessler R. The relationship of agoraphobia and panic in a community sample of adolescents and young adults. Arch Gen Psychiatry 1998;55:1017–24.
[27] Wittchen H-U, Lachner G, Wunderlich U, Pfister H. Test-retest reliability of the computerized DSM-IV version of the Munich- Composite International Diagnostic Interview (M-CIDI). Soc Psychiatry Psychiatr Epidemiol 1998;33: 568–78.
[28] Neverlien PO. Assessment of a single-item dental anxiety question. Acta Odontol Scand 1990;48:365–9.
[29] Viinikangas A, Lahti S, Yuan S, Pietila I, Freeman R, Humphris G. Evaluating a single dental anxiety question in Finnish adults. Acta Odontol Scand 2007;65:236–40.
[30] Armfield JM. Cognitive vulnerability: a model of the etiology of fear. Clin Psychol Rev 2006;26:746–68.
[31] O'Brien C, Gaher RM, Pope C, Smiley P. Difficulty identifying feelings predicts the persistence of trauma symptoms in a sample of veterans who experienced military sexual trauma. J Nerv Ment Dis 2008;196:252–5.