

Associations of perceived pain and painless TMD-related symptoms with alexithymia and depressive mood in media personnel with or without irregular shift work

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Ahlberg J, Nikkilä H, Könönen M, Partinen M, Lindholm H, Sarna S, Savolainen A. Associations of perceived pain and painless TMD-related symptoms with alexithymia and depressive mood in media personnel with or without irregular shift work. *Acta Odontol Scand* 2004;62:119–123. Oslo. ISSN 0001-6357.

The aim of the present study was to analyze whether previously emerged pain symptoms and painless temporomandibular disorder (TMD) symptoms are associated with alexithymia and self-rated depression among media personnel in or not in irregular shift work. A standardized questionnaire was mailed to all employees of the Finnish Broadcasting Company in irregular shift work ($n = 750$) and to an equal number of randomly selected controls in regular 8-h daytime work. The questionnaire covered demographic items, employment details, general health experience, physical status, psychosomatic symptoms, psychosocial status, stress, work satisfaction and performance, and health-care use. Studied age groups, marital status, gender or perceived health were not significantly associated with alexithymia in the bivariate analyses. Most studied painless TMD symptoms associated significantly with alexithymia. Alexithymia was also significantly more prevalent among those who reported having more often than average neck pain ($P < 0.05$), head pain ($P < 0.05$), and tender teeth ($P < 0.01$). According to logistic regression, the probability of alexithymia was significantly positively associated with pain symptoms ($P < 0.05$) and painless TMD-related symptoms ($P < 0.01$), and significantly negatively associated with female gender ($P < 0.01$). Additionally, depressive mood was significantly positively associated with dissatisfaction of one's work-shift schedule ($P < 0.05$), and poorer health experience ($P < 0.01$). Neither alexithymia nor depression was associated with irregular shift work in itself. In conclusion, depressive mood may be a sign of dissatisfaction and impaired well-being. In the case of perhaps less disabling but common physical symptoms alexithymia as a possible underlying factor may be relevant in the diagnosis and management of such disorders. □ *Logistic regression; non-patient; psychosocial; TAS-20; work stress*

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Sifneos introduced the term 'alexithymia', which (derived from the Greek) literally means having no words for emotions (a = lack, lexis = word, thymos = emotions) (1). Alexithymia can be defined as a disturbance in affective and cognitive function, including difficulty in describing or recognizing emotions, a general constriction in affective life, and a limited fantasy life. Although alexithymia is not a disease entity but rather a feature of personality or behavioral phenotype that overlaps diagnostic entities, its manifestation seems to have some bearing on both somatic and psychiatric morbidity (2–4). Research has revealed that many individuals with alexithymia have somatic and psychosomatic complaints (5–7). Alexithymia has also been linked to symptoms of temporomandibular disorders (TMD), although only few reports exist (8, 9).

Comorbidity between alexithymia and depression has been shown (2), and it has been claimed that self-rated alexithymia and depression scales in fact describe same constructs (10). According to recent research, however, these seem to measure distinct constructs and not merely

different measures for the same underlying construct (11). Research also indicates that alexithymia may not be a reaction to psychological distress but rather a stable trait (12): in patient studies, significant decrements in depression scores have been found over time by changes in the degree of activity of their disease, while there have not been significant changes in the alexithymia scores (13, 14). On the other hand, whereas alexithymia appears to be a stable trait on the basis of similarity of the mean scores in separate study phases, alexithymic features also appear to be state-dependent and related to depressive symptoms (15).

Currently in the Finnish media industry, however, production and the delivery of radio and TV programs are in transition from analog to digital technique. Technological changes are bringing about new professions and competency requirements, whereas some of the existing competencies are no longer needed. In addition, the 24-h culture of work in the modern media with its irregular work shifts may enhance the psychological strenuousness

of work in an already demanding work environment, resulting in increased stress and physical impairment.

Distinct biopsychosocial symptom profiles have been found among multiprofessional media personnel (16), and another study has shown a clear-cut association between self-reported bruxism and stress (17). A recent report, derived from the present database, revealed that more severe stress was felt among personnel in irregular shift work than in those in regular daytime work, and that frequent bruxism was more often reported by employees dissatisfied with their current workshift schedule (18). These studies not only imply that stress-related bruxism may mediate TMD-related symptoms, they also suggest a link between stress at work overall and perceived symptoms. Nevertheless, alexithymia and depressive mood may either be underlying factors for the symptoms or constructs influenced by current physical state.

The aim of the present study was to analyze whether previously emerged pain symptoms and painless TMD-related symptoms are associated with alexithymia and self-rated depression among media personnel in or not in irregular shift work.

Materials and methods

A standardized questionnaire was mailed to all employees of the Finnish Broadcasting Company in irregular shift work ($n = 750$) and to an equal number of randomly selected controls at the company in regular 8-h daytime work. The work duties of the media personnel included journalism, broadcasting, program production, technical support, and administration.

The overall response rate was 58.3% (53.7% men). The response rate in the irregular shift work group was 82.3% (56.6% men) and in the regular daytime work group 34.3% (46.7% men). The mean age of males in shift work was 45.0 (s 10.6) years and of females 42.6 (s 10.7) years ($P < 0.001$); the figures for daytime workers were 47.4 (s 9.7) and 45.5 (s 10.1) years (NS), respectively (18).

The questionnaire covered demographic items, employment details, general health experience, physical status, psychosomatic symptoms, psychosocial status, stress, work satisfaction and performance, and health-care use. For the present study, the data were categorized as follows:

- Demographic data: gender, age in years
- Work: irregular shifts (night shifts and shifts which end between 23.00 and 02.00 or start between 03.00 and 06.00) versus 8-h daytime work
- Dissatisfaction with current workshift schedule (irregular shifts versus regular daytime work)
- Self-reported perceived health compared with other persons of same age (very good, good, mediocre, poor, very poor)
- Alexithymia: Toronto Alexithymia Scale (TAS-20) score above 0.6 (19, 20)
- Depressive mood: the Symptom Checklist 90 Revised

(SCL-90-R) (21) was used as proposed in the Research Diagnostic Criteria for Temporomandibular Disorders (22). Subjects were classified as normal, or as having moderately or severely depressive mood. Classification was done by dividing subjects by percentiles: normal below 70th percentile, moderate above the 70th percentile, and severe above the 90th percentile of the study population.

- Frequency of pain symptoms and painless TMD-related symptoms which loaded significantly in the previously identified biopsychosocial factors describing pain symptoms and painless symptoms (16). Each question covering frequency of symptoms over the previous 12 months had a Likert-type scale of 1 to 5, where 1 = never, 2 = seldom, 3 = sometimes, 4 = often, and 5 = continually. For each symptom variable the response score was dichotomized at its arithmetic mean, i.e. each variable describes a perception which is present more often or less often than on average in the studied population.

Statistical methods

The chi-square test was used to compare the severity of studied physical symptoms and alexithymia, and also to compare the occurrence of alexithymia by workshift schedule, age, marital status, gender, and perceived health and depression. Logistic regression models were used to analyze the independent effects of the background variables on the probability of alexithymia, and severely depressive mood. Independent background variables included in the multivariate models were: symptom variables (see Table 2) that associated significantly with alexithymia in the cross tabulations as total sum variables (cut-off point the arithmetic mean of the total sum), gender (male = 0, female = 1), self-reported state of poor or very poor health (no = 0, yes = 1), irregular shift work (no = 0, yes = 1), dissatisfaction with one's work-shift schedule (no = 0, yes = 1), and age in years as a continuous variable. Additionally, depression was used as an independent variable in the model to study the probability of alexithymia, and vice versa. The forced entry method was used in both models, i.e. all independent variables were entered in a single step in the regression models. The models were also tested without alexithymia and depression as independent variables, and including them in the models was not considered to cause multicollinearity.

Results

The occurrence of alexithymia was 9.4% in shift work and 8.6 in daytime work (NS). Studied age groups, marital status, gender or perceived health were not significantly associated with alexithymia in the bivariate analyses. Severely depressive mood was slightly more prevalent in females (5.8%) than in males (4.0%) ($P < 0.05$). Depressive

Table 1. Percentage distributions by age group, marital status, gender, and depressive mood (SCL-90-R) in alexithymic and non-alexithymic groups. Chi-square test

<i>n</i> = 874	Alexithymia (%)	Non-alexithymic (%)	sig. <i>P</i> =
Age group			0.082
<35	15.0	25.9	
35–54	63.8	53.2	
>54	21.3	20.9	
Marital status			0.309
Married or cohabiting	61.3	69.4	
Single	21.3	17.7	
Divorced or widowed	17.5	12.9	
Gender (male)	63.8	52.8	0.061
Depressive mood			0.001
No	40.0	72.7	
Moderate	33.8	19.1	
Severe	26.3	8.2	
Health (poor, very poor)	12.2	9.0	0.489

mood was also significantly more prevalent among alexithymic than non-alexithymic subjects ($P < 0.001$) (Table 1).

Most studied painless TMD-related symptoms associated significantly with alexithymia. Alexithymia was also significantly more prevalent among those who reported having neck pain more often than average ($P < 0.05$), head pain ($P < 0.05$), and tender teeth ($P < 0.01$) (Table 2).

According to logistic regression, the probability of alexithymia was significantly positively associated with pain symptoms ($P < 0.05$) and painless TMD-related symptoms ($P < 0.01$), and significantly negatively associated with female gender ($P < 0.01$) (Table 3). The

probability of severely depressive mood was also significantly positively associated with studied symptoms (Table 3). Additionally, depressive mood was significantly positively associated with dissatisfaction with one's work-shift schedule ($P < 0.05$), and poorer health experience ($P < 0.01$) (Table 3). Neither alexithymia nor depression was associated with irregular shift work in itself.

Discussion

In the present study we investigated the associations of perceived pain and painless TMD-related symptoms with alexithymia and self-rated depression in media personnel who could be considered as under sustained pressure at work due to intense ongoing technological and organizational change. A special focus was on irregular shift work, which, however, did not emerge as a significant factor in itself.

The significant associations found between alexithymia and the TMD-related symptoms confirm the findings of the few existing reports in the dental literature (8, 9). The overall prevalence of alexithymia and the fact that alexithymia was more prevalent among males are both congruent with previous knowledge (9, 10). Our results are also in line with previous reports concerning the prevalence of depression among alexithymic populations (10, 23, 24).

We used logistic regression, which enabled us to study the independent effect of each background variable on the probability of the studied item while simultaneously controlling the effects of other background variables. In both models used, the significant associations between

Table 2. Pain symptoms and painless TMD-related symptoms. Prevalence of alexithymia when a symptom is perceived less/as frequently or more frequently than on average. Chi-square test

Symptom score Alexithymia	≤Mean %	>Mean %	Sig., <i>P</i> =	Total mean (<i>s</i>)
<i>n</i> = 874				
Pain symptoms:				
Neck pain	6.1	11.1	0.020	3.0 (1.1)
Head pain	7.9	11.5	0.049	2.5 (1.0)
Back pain	8.5	10.6	0.293	2.5 (1.1)
Pain affecting work	8.4	10.6	0.298	1.8 (1.0)
Eye pain	8.3	11.7	0.122	2.0 (1.0)
Jaw pain	8.1	12.2	0.061	1.5 (0.8)
Toothache	8.3	10.9	0.206	1.5 (0.7)
Tender teeth	5.4	12.7	0.001	1.8 (0.9)
Earache	8.2	12.0	0.082	1.4 (0.7)
Painless TMD-related symptoms:				
Biting difficulty	8.4	12.5	0.101	1.3 (0.7)
Teeth do not fit	7.3	15.6	0.001	1.4 (0.8)
Difficulty moving jaw	8.5	14.0	0.041	1.3 (0.6)
Difficulty opening jaw	8.9	14.2	0.069	1.2 (0.5)
Jaw locking	9.1	11.5	0.409	1.2 (0.6)
TMJ clicking	6.9	14.3	0.001	1.6 (1.0)
Muscle tiredness in jaws	7.4	15.0	0.001	1.4 (0.8)
Blocked ears	6.6	12.4	0.004	1.7 (0.9)
Hearing difficulty	7.4	12.6	0.012	1.6 (0.9)

s = standard deviation.

Table 3. Variables entered in the multivariate model. Mean sum scores for the symptom variables, and effects of the studied independent variables on the probability of alexithymia and depressive mood. Figures for depressive mood in *italics*. Logistic regression

<i>n</i> = 874	Items	Mean sum (<i>s</i>)	B	Odds ratio	95% CI	sig. <i>P</i> =
Pain symptoms	3	2.4 (0.5)	0.60 <i>1.05</i>	1.8 <i>2.9</i>	1.1–3.0 <i>1.6–5.1</i>	0.036 <i>0.001</i>
Painless TMD-related symptoms	6	1.5 (0.5)	0.81 <i>1.10</i>	2.2 <i>3.1</i>	1.3–3.8 <i>1.8–5.3</i>	0.003 <i>0.001</i>
Gender (female)			–0.72 <i>0.47</i>	0.5 <i>1.6</i>	0.3–0.8 <i>0.9–2.7</i>	0.008 <i>0.079</i>
Irregular shift work			–0.03 <i>0.40</i>	0.9 <i>1.5</i>	0.6–1.7 <i>0.8–2.8</i>	0.913 <i>0.217</i>
Dissatisfaction with work shifts			–0.19 <i>0.68</i>	0.8 <i>2.0</i>	0.4–1.6 <i>1.1–3.4</i>	0.570 <i>0.016</i>
Health (poor, very poor)			–1.80 <i>1.36</i>	0.8 <i>3.9</i>	0.3–2.3 <i>1.8–8.6</i>	0.723 <i>0.001</i>
Depressive mood			1.11	3.1	1.6–5.7	0.001
Alexithymia			<i>1.11</i>	<i>3.0</i>	<i>1.6–5.7</i>	<i>0.001</i>
Age (in years)			0.02 <i>–0.04</i>	n.a. <i>n.a.</i>	n.a. <i>n.a.</i>	0.150 <i>0.727</i>
Constant			–3.6 <i>–4.3</i>			

s = standard deviation.

alexithymia and depression imply comorbidity between them. Pain symptoms and symptoms related to TMD, which have been linked to stress and psychosocial issues (25–29), were independently associated with both alexithymia and severe depressive mood. The significantly strong independent effect of the TMD-related symptom cluster found in the present non-patient population is noteworthy.

In addition, dissatisfaction with one's work-shift schedule and poor health experience was significantly positively associated with depressive mood but not with alexithymia, which partly confirms the view that self-rating regarding alexithymia is less influenced by the current state of an individual than in the case of a depression scale (12–14). Moreover, the finding suggests a quasi-static equilibrium between depressive mood, dissatisfaction, and perceived health, although the implicit relationships are impossible to explain owing to the cross-sectional approach.

The clinical importance of alexithymia has been linked to its influence on stress recognition and symptom awareness (30, 31), and thus to its potentially negative effect on the individual's ability to seek adequate medical consultation. Moreover, alexithymia seems to have some influence on treatment responses (32). One theory for a causal relationship between alexithymia and psychosomatic illnesses, for example, is that alexithymics may lack the so-called affective awareness which would permit identification of a particular situation as stressful, and they therefore experience stressful events longer and more frequently than non-alexithymics; this, in turn, may lead to a cascade of increased or excessive sympathetic activity, tissue damage, and pain (33). Preventive efforts directed to processes that lead from stress to stress-related disorders

include recognition of the individuals at greatest risk. The view that alexithymia may be one of the stress reaction modulators prompts the question of screening alexithymic subgroups out of populations experiencing stressful life events as a means of directing special concern on them and of taking thorough follow-up measures (34).

However, a recent study among employees of the same company as in the present study found that those who felt stressed about work issues and health issues were more likely to report decreased work performance (35). Additionally, those who felt continuous pain or severe pain were more likely to report difficulties in performing their work. Another study further underscored awareness of the associations between perceived stress and health issues, and suggested a link to decreased productivity as well as to increased sick leave (36).

In the present study we found that both alexithymia and depressive mood were positively associated with several pain symptoms and painless TMD-related symptoms in non-patient working personnel. Depressive mood may be a sign of dissatisfaction and impaired well-being. In the case of perhaps less disabling but common physical symptoms such as TMD, alexithymia as an underlying factor is relevant in their diagnosis and management. In addition, awareness of constructs such as alexithymia and depression also in non-patients may be important in terms of preventing pain and/or stress problems becoming chronic and disabling as well as in avoiding the consequential costs on a personal as well as organizational, work, and societal levels.

Acknowledgements.—Our study was supported by the Finnish Work Environment Fund.

References

- Sifneos PE. The prevalence of alexithymic characteristics in psychosomatic patients. *Psychoter Psychosom* 1973;22:255–62.
- Honkalampi K, Hintikka J, Tanskanen A, Lehtonen J, Viinamäki H. Depression is strongly associated with alexithymia in the general population. *J Psychosom Res* 2000;48:99–104.
- Valkamo M, Hintikka J, Honkalampi K, Niskanen L, Koivumaa-Honkanen H, Viinamäki H. Alexithymia in patients with coronary heart disease. *J Psychosom Res* 2001;50:125–30.
- Kojima M, Senda Y, Nagaya T, Tokudome S, Furukawa TA. Alexithymia, depression and social support among Japanese workers. *Psychother Psychosom* 2003;72:307–14.
- Taylor GJ, Bagby RM, Parker JD. The alexithymia construct: a potential paradigm for psychosomatic medicine. *Psychosom* 1991;32:153–64.
- Kauhanen J, Kaplan GA, Julkunen J, Wilson TW, Salonen JT. Social factors in alexithymia. *Compr Psychiatr* 1993;34:330–5.
- Cohen K, Auld F, Brooker H. Is alexithymia related to psychosomatic disorder and somatizing? *J Psychosom Res* 1994;38:1119–27.
- Heiberg A, Helöe B, Krogstad B. The myofascial pain dysfunction: dental symptoms and muscular function. An overview. A preliminary study by team approach. *Psychoter Psychosom* 1978;30:81–97.
- Sipilä K, Veijola J, Jokelainen J, Järvelin M-R, Oikarinen K, Raustia A, et al. Association of symptoms of TMD and orofacial pain with alexithymia: an epidemiological study of the Northern Finland 1966 birth cohort. *Cranio* 2001;19:246–51.
- Hendryx MS, Haviland G, Shaw DG. Dimensions of alexithymia and their relationships to anxiety and depression. *J Pers Assess* 1991;56:227–37.
- Muller J, Buhner M, Ellgring H. Relationship and differential validity of alexithymia and depression: a comparison of the Toronto Alexithymia and Self-Rating Depression Scales. *Psychopathology* 2003;36:71–97.
- Martinez-Sanchez F, Ato-Garcia M, Ortiz-Soria B. Alexithymia—state or trait? *Span J Psychol* 2003;6:51–9.
- De Groot JM, Rodin G, Olmsted MP. Alexithymia, depression, and treatment outcome in bulimia nervosa. *Compr Psychiatr* 1995;36:53–60.
- Fukunishi I, Chishima Y, Anze M. Post-traumatic stress disorder and alexithymia in burn patients. *Psychol Rep* 1994;75:1371–6.
- Honkalampi K, Koivumaa-Honkanen H, Tanskanen A, Hintikka J, Lehtonen J, Viinamäki H. Why do alexithymic features appear to be stable? *Psychother Psychosom* 2001;70:247–53.
- Ahlberg J, Suvinen TI, Rantala M, Lindholm H, Nikkilä H, Savolainen A, et al. Distinct biopsychosocial profiles emerge among nonpatients. *J Psychosom Res* 2003;53:1077–81.
- Ahlberg J, Rantala M, Savolainen A, Suvinen T, Nissinen M, Sarna S, et al. Reported bruxism and stress experience. *Community Dent Oral Epidemiol* 2002;30:405–8.
- Ahlberg K, Ahlberg J, Könönen M, Partinen M, Lindholm H, Savolainen A. Reported bruxism and stress experience in media personnel with or without irregular shift work. *Acta Odontol Scand* 2003;61:315–8.
- Bagby RM, Parker JD, 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.
- Bagby RM, Taylor GJ, Parker JD. The twenty-item Toronto Alexithymia Scale—II. Convergent, discriminant, and concurrent validity. *J Psychosom Res* 1994b;38:33–40.
- Derogatis L. The SCL-90-R. Baltimore: Clinical Psychometric Research; 1975.
- Dworkin S, LeResche L. Research diagnostic criteria for temporomandibular disorders: review, criteria, examinations and specifications critique. *J Craniomandib Dis Fac Oral Pain* 1992;6:301–55.
- Honkalampi K, Saarinen P, Hintikka J, Virtanen V, Viinamäki H. Factors associated with alexithymia in patients suffering from depression. *Psychother Psychosom* 1999;68:270–5.
- Bankier B, Aigner M, Bach M. Alexithymia in DSM-IV disorder: comparative evaluation of somatoform disorder, panic disorder, obsessive-compulsive disorder, and depression. *Psychosomatics* 2001;42:235–40.
- Rollman GB, Gillespie JM. The role of psychosocial factors in temporomandibular disorders. *Curr Rev Pain* 2000;4:71–81.
- Sipilä K, Veijola J, Jokelainen J, Järvelin M-R, Oikarinen KS, Raustia AM, et al. Association between symptoms of temporomandibular disorders and depression: an epidemiological study of the northern Finland 1966 birth cohort. *Cranio* 2001;19:183–7.
- Huang GJ, LeResche L, Critchlow CW, Martin MD, Drangsholt MT. Risk factors for diagnostic subgroups of painful temporomandibular disorders (TMD). *J Dent Res* 2002;81:284–8.
- Rammelsberg P, LeResche L, Dworkin S, Mancl L. Longitudinal outcome of temporomandibular disorders: a 5-year epidemiologic study of muscle disorders defined by Research Diagnostic Criteria for Temporomandibular Disorders. *J Orofac Pain* 2003;17:9–20.
- Rantala MA, Ahlberg J, Lindholm H, Suvinen TI, Savolainen A, Könönen M. TMJ related painless symptoms, orofacial pain, neck pain, headache, and psychosocial factors among multi-professional media personnel. *Acta Odontol Scand* 2003;61:217–22.
- Stone LA, Nielson KA. Intact physiological response to arousal with impaired emotional recognition in alexithymia. *Psychother Psychosom* 2001;70:92–102.
- Lane RD, Sechrest L, Riedel R, Shapiro DE, Kaszniak AW. Pervasive emotion recognition deficit common to alexithymia and the repressive coping style. *Psychosom Med* 2000;62:492–501.
- Ozsahin A, Uzun O, Cansever A, Gulcat Z. The effect of alexithymic features on response to antidepressant medication in patients with major depression. *Depress Anxiety* 2003;18:62–6.
- Taylor GJ. Recent developments in alexithymia theory and research. *Can J Psychiatry* 2000;45:134–42.
- Joukamaa M, Karlsson H, Sholman B, Lehtinen V. Alexithymia and psychological distress among frequent attendance patients in health care. *Psychother Psychosom* 1996;65:199–202.
- Suvinen TI, Ahlberg J, Rantala M, Nissinen M, Lindholm H, Könönen M, et al. Perceived stress, pain and work performance among non-patient working personnel with temporomandibular or neck pain. *J Oral Rehabil*. In press.
- Ahlberg J, Könönen M, Nissinen M, Rantala M, Sarna S, Lindholm H, et al. Self-reported stress among multiprofessional media personnel. *Occup Med* 2003;53:403–5.

Received for publication 10 February 2004

Accepted 3 March 2004