

Temporomandibular joint related painless symptoms, orofacial pain, neck pain, headache, and psychosocial factors among non-patients

Mikko A. I. Rantala, Jari Ahlberg, Tuija I. Suvinen, Maunu Nissinen, Harri Lindholm, Aslak Savolainen and Mauno Könönen

Department of Stomatognathic Physiology and Prosthetic Dentistry, Institute of Dentistry, University of Helsinki, Helsinki, Finland; Department of Oral and Maxillofacial Diseases, Helsinki University Central Hospital, Helsinki, Finland; Finnish Broadcasting Company, Helsinki, Finland; Riihimäki District Hospital, Riihimäki, Finland; Finnish Institute of Occupational Health, Vantaa, Finland; Department of Restorative Sciences, Faculty of Dentistry, Kuwait University, Kuwait

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The aims of this study were to assess the prevalence of temporomandibular joint related (TMJ) painless symptoms, orofacial pain, neck pain, and headache in a Finnish working population and to evaluate the association of the symptoms with psychosocial factors. A self-administered postal questionnaire concerning items on demographic background, employment details, perceived general state of health, medication, psychosocial status, and use of health-care services, was mailed to all employees with at least 5 years at their current job. The questionnaire was completed by 1339 subjects (75%). Frequent (often or continual) TMJ-related painless symptoms were found in 10%, orofacial pain in 7%, neck pain in 39%, and headache in 15% of subjects. Females reported all pain symptoms significantly more often than men ($P < 0.001$). Frequent pain and TMJ-related symptoms were significantly associated with self-reported stress, depression, and somatization ($P < 0.001$). Perceived poor general state of health ($P < 0.001$), health care visits ($P < 0.001$), overload at work ($P < 0.001$), life satisfaction ($P < 0.05$), and work satisfaction ($P < 0.05$) were also significantly associated with pain symptoms, but the work duty was not ($P > 0.05$). Our findings are in accordance with earlier studies and confirm the strong relationship between neck pain, headache, orofacial pain, TMJ-related painless symptoms, and psychosocial factors. Furthermore, TMJ-related symptoms and painful conditions seem to be more associated with work-related psychosocial factors than with type of work itself. □ *Headache; neck pain; psychosocial; temporomandibular disorders; working population*

Mikko A. I. Rantala, University of Helsinki, Institute of Dentistry, Department of Stomatognathic Physiology and Prosthetic Dentistry, P.O. Box 41, FI-00014 Helsinki, Finland. E-mail. mikko.rantala@helsinki.fi

Chronic painful conditions are common among populations: the prevalence of orofacial pain is reported to be 7–26%, headache 11–26%, and neck pain 34% (1–7). Temporomandibular disorders (TMD) have been included among chronic pain conditions (8) and their symptom prevalence, with figures from epidemiological studies of 22% to 30% (9). Pain is commonly accepted as the most frequent presenting symptom of TMD, but other temporomandibular joint (TMJ) related painless symptoms are also common (10). In the general population, the estimated prevalence of clinically significant TMD-related jaw pain has been 5% (11), while the treatment need for TMD has ranged from 3% to 16% (12–15). Earlier studies indicate female predominance in the symptom prevalence of TMD, orofacial pain, neck pain, and headache (1, 16–20). According to some studies, TMD subjects use more health-care services and take more sick leave than do non-TMD subjects (21–24), and medication use is also more prevalent among them (23).

Among working populations, many physical problems and symptoms are thought to be initiated and perpetuated by stressors of the workplace (25). Although extensive resources have been allocated to improve the work environment throughout industrial countries, the psychosocial loading of work has become an integral part of

modern life. Working-age populations are most likely to experience stress-related symptoms. Several studies have shown associations between TMD symptoms, orofacial pain, neck pain, and headache, and psychosocial factors (1, 26–37). Yet it is not clearly understood how TMD is linked to other stress-related symptoms or work issues among non-patients. TMD patients are reported not to differ from other pain patients regarding their personality or means of coping with stress (38).

The present report is the first part of a prospective study on stress at work. Our aims were to assess the prevalence of TMJ-related painless symptoms, orofacial pain, neck pain, and headache in Finnish multiprofessional media personnel with a relatively low level of physical stressors at work, but presumably high psychosocial loading, and to evaluate whether these symptoms are associated with sociodemographic or psychosocial factors, or with health behavior.

Materials and methods

In March 1999 a standardized questionnaire was mailed to all 30- to 55-year-old employees of the Finnish Broadcasting Company Ltd. whose current employment had

lasted at least 5 years in the Helsinki area ($n = 1784$). The company provides occupational health and dental services, which are free-of-charge for its employees. The mean age of respondents ($n = 1339$, 75%) was 46 years ($SD (s) = 7$) for both genders (males 51%). The questionnaire included items on sociodemographic background, perceived pain, and TMJ-related painless symptoms, psychosocial status, and health behavior. Answers were given anonymously. Ethics clearance was obtained from the University of Helsinki ethics committee.

From the questionnaire data, the following variables were categorized and labelled for the present study.

Sociodemographic data

Age, gender, marital status (married or cohabiting, single, divorced, or widowed) and weekly working hours were included. Type of work was classed as leadership or management = superior; journalism = journalist; program production or technical support = production; program planning, research and development = planning; service, logistics or maintenance = service; administration = administration. Shift work was also categorized.

Physical symptoms

TMJ-related painless symptoms (jaw-opening difficulties, jaw-moving difficulties, a feeling of tiredness in the jaws, TMJ clicking or crepitus, or jaws becoming caught or locked), orofacial pain (facial pain, jaw pain, or mouth or tongue pain), neck pain or headache perceived during the previous 12 months were determined on a 5-point scale (1 = never, 2 = seldom, 3 = sometimes, 4 = often, and 5 = continually). Symptoms perceived were dichotomized as frequent (present often or continually) or non-frequent (else). At least one of the symptoms had to be frequent in the sum variables (TMJ-related painless symptoms or orofacial pain).

Psychosocial factors

Depression and somatization. The Symptom Checklist 90 Revised (SCL-90-R) (39, 40) depression and somatization classification was used as proposed in the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) (41). Questions about perceived symptoms during the previous 12 months were asked. Subjects were classified as normal, or as having moderate or severe depression or somatization. Classification was done by dividing subjects by percentiles: normal below the 70th percentile, moderate above the 70th percentile, and severe above the 90th percentile on the study population.

Stress and satisfaction. Level of perceived stress according to the Occupational Stress Questionnaire (OSQ) (42) was measured as follows: 'Stress means the situation when a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his mind is troubled all the time. Do you feel that kind of stress these days?' Rather

much or very much were considered as high stress, and not at all, only a little, or to some extent, as low stress. Satisfaction with life and work was measured as follows: 'How satisfied are you with your present life (/work)?' Rather satisfied or very satisfied were considered as satisfied, and neither satisfied nor dissatisfied, rather dissatisfied, or very dissatisfied as dissatisfied.

Influence potential (OSQ): 'At work, can you influence matters concerning you?' Very much, rather much, or to some extent were considered as yes, and very little or not at all as no.

Hurry at work (OSQ): 'Do you have to hurry to get work done?' Never, rather seldom, or now and then were considered as no hurry, and rather often or constantly as hurry.

Distribution of work (OSQ): 'Is the amount of work distributed unevenly so that work piles up?' Sometimes, rather seldom, or very seldom were considered as evenly distributed, and rather often or very often as unevenly distributed.

Health behavior

Current self-rated general state of health was assessed by an overall rating of health on a 5-point scale (1 = excellent, 2 = good, 3 = average, 4 = poor, or 5 = very poor). This measure was dichotomized by grouping response scores 1–3 as a category of good health and scores 4–5 as a category of poor health. Numbers of visits to physician and dentist, medications, and days absent from work during the previous 12 months were also asked about, and the reason for the latest appointment. Pain was one of the five reasons given.

Statistical methods

The chi-square test was used to study the associations between categorical variables, with the level of significance set at $P < 0.05$.

Results

The prevalence of frequent TMJ-related painless symptoms was 10%, orofacial pain 7%, neck pain 38%, and headache 15%. Overall, 43% of the subjects reported at least one of these symptoms as frequent. TMJ-related painless symptoms, orofacial pain, or both were experienced frequently by 13%. TMJ-related painless symptoms and all pain symptoms were significantly associated with female gender, but not with weekly working hours or marital status. Headache was significantly associated with younger age (Table 1). TMJ-related painless symptoms, orofacial pain, neck pain, and headache were significantly associated with almost all the psychosocial variables (Table 2).

None reported very poor health and 5% rated their general state of health as poor. All pain symptoms except

Table 1. Relation of sociodemographic and work characteristics to frequently perceived pain and TMJ-related painless symptoms

<i>n</i> = 1339	No. of respondents	TMJ-related painless symptoms			Orofacial pain			Neck pain			Headache		
		<i>n</i>	(%)	<i>p</i>	<i>n</i>	(%)	<i>p</i>	<i>n</i>	(%)	<i>p</i>	<i>n</i>	(%)	<i>p</i>
Age group (years)				0.367			0.793			0.373			0.005
30–39	265	25	(9.7)		15	(5.7)		93	(35.2)		53	(20.2)	
40–49	560	59	(11.0)		38	(6.9)		207	(37.4)		90	(16.5)	
50–55	514	41	(8.4)		34	(6.8)		203	(40.2)		58	(11.6)	
Gender				0.001			<0.001			<0.001			<0.001
Female	654	78	(12.5)		61	(9.8)		318	(49.0)		140	(21.8)	
Male	685	47	(7.1)		26	(3.9)		185	(27.5)		61	(9.1)	
Married or cohabiting				0.827			0.520			0.686			0.867
Yes	981	90	(9.6)		61	(6.4)		364	(37.7)		148	(15.4)	
No	358	35	(10.0)		26	(7.4)		139	(38.9)		53	(15.1)	
Type of work				0.351			0.912			0.555			0.142
Superior	151	19	(12.9)		11	(7.4)		53	(35.3)		18	(12.2)	
Journalist	357	33	(9.6)		27	(7.7)		128	(36.1)		50	(14.3)	
Production	326	33	(10.5)		22	(6.9)		123	(38.2)		59	(18.6)	
Planning	148	9	(6.5)		7	(5.0)		53	(37.1)		14	(9.8)	
Service	213	14	(7.0)		11	(5.3)		81	(38.9)		32	(15.3)	
Administration	109	14	(13.0)		7	(6.4)		48	(44.0)		22	(20.4)	
Other	34	3	(8.8)		2	(5.9)		17	(50.0)		6	(17.6)	
Shift work				0.776			0.839			0.006			0.224
Yes	384	37	(10.1)		26	(6.9)		122	(32.2)		50	(13.4)	
No	941	87	(9.6)		60	(6.6)		375	(40.3)		149	(16.1)	

Numbers do not add up to total because of missing values.

Table 2. Relation of psychosocial variables to frequently perceived pain and TMJ-related painless symptoms

<i>n</i> = 1339	No. of respondents	TMJ-related painless symptoms			Orofacial pain			Neck pain			Headache		
		<i>n</i>	%	<i>p</i>	<i>n</i>	%	<i>p</i>	<i>n</i>	%	<i>p</i>	<i>n</i>	%	<i>p</i>
Depression (SCL-90-R)				<0.001			<0.001			<0.001			<0.001
Normal	889	51	(5.9)		32	(3.6)		269	(30.4)		78	(8.9)	
Moderate	309	46	(15.5)		30	(10.0)		154	(50.8)		78	(25.7)	
Severe	119	24	(23.3)		22	(20.6)		67	(58.8)		39	(36.1)	
Somatization (SCL-90-R)				<0.001			<0.001			<0.001			<0.001
Normal	911	59	(6.3)		33	(3.5)		248	(26.2)		63	(6.7)	
Moderate	241	40	(15.5)		31	(11.8)		164	(62.1)		82	(31.4)	
Severe	94	26	(27.1)		23	(22.8)		90	(80.4)		56	(52.8)	
Perceived stress (OSQ)				<0.001			<0.001			<0.001			<0.001
High	316	50	(16.4)		48	(15.5)		172	(54.8)		88	(28.6)	
Low	1020	75	(7.6)		39	(3.9)		330	(32.8)		113	(11.3)	
Satisfied with work (OSQ)				0.152			0.039			<0.001			<0.001
Yes	1196	107	(9.3)		72	(6.2)		430	(36.4)		164	(14.0)	
No	141	18	(13.1)		15	(10.8)		73	(51.8)		37	(26.4)	
Satisfied with life (OSQ)				0.007			0.013			<0.001			0.001
Yes	963	77	(8.4)		52	(5.5)		329	(34.5)		125	(13.2)	
No	370	48	(13.3)		34	(9.4)		171	(47.0)		74	(20.5)	
Influence potential at work (OSQ)				0.018			0.007			0.015			0.001
Yes	1159	100	(8.9)		67	(5.9)		421	(36.8)		159	(14.0)	
No	179	25	(14.7)		20	(11.4)		82	(46.3)		42	(24.0)	
Hurry at work (OSQ)				0.014			0.013			<0.001			<0.001
Yes	602	69	(12.0)		50	(8.6)		255	(42.9)		113	(19.3)	
No	734	56	(7.9)		37	(5.1)		248	(34.2)		87	(12.0)	
Evenly distributed work (OSQ)				0.009			0.154			<0.001			<0.001
Yes	544	38	(7.2)		29	(5.4)		169	(31.5)		59	(11.0)	
No	791	87	(11.5)		57	(7.4)		334	(42.7)		142	(18.4)	

Numbers do not add up to total because of missing values.

SCL-90-R = Symptom Checklist 90 Revised (Derogatis, 1975, 1983).

OSQ = Occupational Stress Questionnaire (Elo et. al., 1992).

Table 3. Relation of health behaviour to frequently perceived pain and TMJ-related painless symptoms

	No. of respondents	TMJ-related painless symptoms			Orofacial pain			Neck pain			Headache		
		n	(%)	p	n	(%)	p	n	(%)	p	n	(%)	p
<i>n</i> = 1339													
Health care visits				0.016			<0.001			<0.001			<0.001
≤Median (3 visits)	737	55	(7.7)		27	(3.8)		218	(30.0)		79	(10.9)	
>Median	588	66	(11.7)		58	(10.3)		280	(48.0)		120	(20.8)	
Reason for latest health care visit				0.960			0.096			0.002			0.005
Pain	164	15	(9.5)		16	(9.9)		81	(50.0)		37	(23.0)	
Other	1121	104	(9.6)		70	(6.4)		414	(37.3)		158	(14.4)	
Dental visits				0.043			0.001			<0.001			0.060
≤Median (1 visit)	726	58	(8.3)		33	(4.6)		242	(33.6)		98	(13.7)	
>Median	603	67	(11.6)		54	(9.2)		259	(43.7)		103	(17.5)	
Reason for latest dental care visit				0.645			0.927			0.347			0.113
Pain	42	5	(11.9)		3	(7.1)		19	(45.2)		10	(23.8)	
Other	1268	119	(9.8)		84	(6.8)		477	(38.1)		185	(14.9)	
Medication													
For blood pressure				0.586			0.109			0.210			0.042
Yes	72	8	(11.6)		8	(11.3)		32	(45.1)		5	(6.9)	
No	1266	117	(9.6)		79	(6.4)		471	(37.6)		196	(15.8)	
For headache				0.438			0.349			0.060			0.280
Yes	592	60	(10.4)		43	(7.4)		241	(40.8)		97	(16.5)	
No	746	65	(9.1)		44	(6.1)		262	(35.8)		104	(14.4)	
Analgesics				0.533			0.078			<0.001			0.057
Yes	391	40	(10.5)		33	(8.5)		185	(47.3)		71	(18.3)	
No	947	85	(9.4)		54	(5.9)		318	(34.2)		130	(14.1)	
Sedatives				0.032			0.027			0.001			0.003
Yes	80	13	(16.7)		10	(12.7)		44	(55.0)		21	(26.9)	
No	1258	112	(9.3)		77	(6.3)		459	(37.0)		180	(14.6)	
Sleeping pills				0.012			<0.001			0.009			0.021
Yes	127	20	(16.0)		19	(15.2)		62	(48.8)		28	(22.4)	
No	1211	105	(9.0)		68	(5.8)		441	(36.9)		173	(14.6)	
Poor general state of health				0.005			<0.001			<0.001			<0.001
Yes	69	13	(19.7)		12	(17.6)		49	(71.0)		28	(41.8)	
No	1264	111	(9.1)		75	(6.1)		452	(36.2)		171	(13.8)	
Absence from work				0.304			0.090			<0.001			0.005
≤Median (4 days)	690	59	(8.9)		37	(5.5)		227	(33.4)		84	(12.5)	
>Median	633	65	(10.6)		49	(7.9)		270	(43.0)		113	(18.1)	

Numbers do not add up to total because of missing values.

headache were significantly associated with the number of health-care visits and of dental care visits during the previous 12 months (Table 1). Headache was associated only with number of health-care visits. Pain was claimed as the reason for the latest health-care visit by 13% of the subjects, significantly more often among those with frequent neck pain and headache, and pain led to the latest dental visit for 3%. Perceived poor general state of health was significantly associated with all the symptoms, but only neck pain and headache with days absent from work. Subjects with TMJ symptoms, orofacial pain, neck pain, or headache more often used sedatives and sleeping pills (Table 3).

Discussion

It has been proposed that studies concerning TMD and related factors should be directed to adult populations (43), as was the case in the present study, because the prevalence of TMD has been reported to be highest in working-age populations (1, 44). The inclusion criteria of 5 years in the same employment may lead to the 'healthy worker effect', i.e. the absence of ex- or new employees can bias the results (45, 46). We aimed, however, to study subjects with similar exposure to the work environment and access to the free-of-charge occupational health and dental care services.

Depending on the criteria used, the prevalence of perceived TMD symptoms varies considerably (9). Our prevalence of frequent TMJ-related painless symptoms (present often or continually) was 10%. TMJ-related painless symptoms, orofacial pain or both were perceived frequently by 13%, suggesting an estimate figure for TMD in the study population. In a questionnaire study, however, defining a disorder like TMD is difficult, because diagnosing it necessitates clinical examination. Subjects in the present study reported equally or less frequent orofacial pain than did others in earlier studies (1, 11), whereas the frequency of neck pain was almost the same as reported earlier (3, 5). Our prevalence for headache was almost the same as in a large Swedish study (2). However, these figures indicate that neck pain is the most common of these symptoms. Pain and TMJ-related painless symptoms were significantly associated with female gender, as several studies have shown (1, 2, 16–20).

Psychosocial factors have been significantly associated with neck pain (30–32) and musculoskeletal disease (47), congruent with our results regarding neck pain. In the present study, psychosocial factors included not only depression and somatization, often regarded as psychosocial factors, but also perceived stress, satisfaction with work, influence potential, hurry at work, and distribution of work, which reflect the perceived working environment. Satisfaction with work was not significantly associated with TMJ-related painless symptoms, nor was distribution of work associated with orofacial pain. All other work-related psychosocial factors were significantly associated

with the symptoms. However, the fact that the type of work was not associated with TMJ symptoms or pain problems may suggest that the tasks themselves did not have a major influence on these symptoms. In the present study, women more often reported psychosocial disturbances and also pain symptoms, which is in accordance with earlier studies (1, 17, 19, 20). The strong association with stress, depression, and somatization, and different pain symptoms was in line with earlier findings (1, 26, 28, 34).

It has also been reported that TMD subjects use health-care services more often than others (23), and our results accord with this finding. However, in our study, employees who reported more TMJ-related painless problems and orofacial pain symptoms did not differ from others regarding absence from work, which is not in line with earlier findings (24). This may be linked with the overall low sickness absence rates in the studied company, which are below the average in Finland. The use of sedatives and sleeping pills was significantly associated with all symptoms.

Pain sensation is always influenced by psychological factors at the central nervous system level, with the proportional contribution of psychological and physical factors being highly variable (48). Whether these psychological factors are the cause or the result of certain painful conditions is not clearly known. These TMJ-related painless symptoms, orofacial pain, neck pain, and headache seem to have similar overall associations among socio-demographic and psychosocial factors, and also with health behavior.

Although our study included non-patients, strong associations with painful conditions and psychosocial factors emerged. The prevalence figures of the present study are in line with those of prior figures regarding the general population. Our findings also confirmed the complex relationship between TMD, the pain variables, gender, and psychosocial factors. However, TMJ-related painless symptoms and studied pain symptoms seem to be more associated with work-related psychosocial factors than with type of work itself. Our results imply that whenever TMJ symptoms and related pain problems are assessed by health-care professionals, the possible psychosocial impact on symptoms should be borne in mind.

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