

Self-reported Impact on Daily Life Activities Related to Temporomandibular Disorders, Headaches, and Neck-Shoulder Pain Among Women in a Sami Population Living in Northern Sweden

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***Aims:** To analyze the influence of frequency, intensity, and duration of temporomandibular disorders (TMD), headaches, and neck-shoulder pain (NSP) on Sami women's daily life. A further aim was to analyze the relationship between these symptoms and age. **Methods:** All 751 Sami women 21 to 70 years old registered in either the Swedish Sami Parliament's electoral register or registered as reindeer owners or herders and living north of the Arctic Circle in Sweden were sent a questionnaire regarding TMD symptoms, NSP, and headaches. In total, 487 women (65%) participated. The questionnaire focused on symptom frequency, duration, and intensity and whether these symptoms influenced activities of daily life. The symptom's interference with daily life activities was measured, respectively, with a numerical rating scale (NRS). The statistical analyses included multiple logistic regression analysis and Chi-square test. A P value < .05 was considered statistically significant. **Results:** Seventeen percent of the women reported that symptoms in the jaw-face region to some degree disturbed their daily life, and for 6%, the interference was significant (≥ 5 on NRS). Duration of jaw pain, troublesome impaired jaw opening, and neck pain, together with a low education level, affected reports of whether symptoms of TMD influenced daily life. Almost half of the study population reported that headaches had a negative impact on their life. A similar pattern was reported for NSP. The prevalence of frequent and troublesome symptoms of TMD and headaches, but not NSP, showed a declining trend with age. **Conclusion:** TMD symptoms, headaches, and NSP negatively influence many Sami women's daily life. Factors related to pain had the greatest influence when these Sami women rated the related impairment. J OROFAC PAIN 2012;26:215–224*

Key words: headache, oral health, pain, quality of life, temporomandibular disorders

Pain comprises a significant burden for both the affected individual and society, with reduced quality of life, associated depression, reduced working capacity, and related social costs.¹ The head and neck region is one of the most common body locations for reported pain.² The term temporomandibular disorder (TMD) is the designation for a number of conditions that include pain and dysfunction in the jaw and face region³; it is regarded as the most common cause of chronic orofacial pain.⁴ TMD, headaches, and neck-shoulder pain (NSP) have in several studies shown comorbidity,^{5–8} and women are more often exposed to these conditions than men.^{9–11}

In a population-based study, almost one out of five of those who reported pain in the orofacial region stated that they had taken time off work or were unable to carry out normal daily activities due to the orofacial pain.¹² A similar result was found in a cross-sectional study on elderly Chinese people.¹³ Studies based on clinical samples with TMD cases have reported that these patients have significant limitations in social activities, impairment in well-being and energy level,¹⁴ and jaw disability.^{15,16} In a recent systematic review, TMD was significantly related to impaired oral health.¹⁷ Despite a fairly high prevalence of TMD symptoms in the population and psychosocial consequences for daily living, which should indicate a significant treatment need, the demand for treatment seems fairly low.^{18,19} In two previous studies, myofascial pain and arthralgia were shown to have a higher impact on the quality of life than disc displacement disorders^{16,20} in TMD patient samples. On the other hand, disc displacement was the most common listed diagnosis in a large series of patients referred to a specialist TMD clinic in Sweden.²¹ Several population-based studies on TMD pain and headaches have shown a declining prevalence with age,^{9,22,23} but impaired quality of life related to TMD was most common among elderly patients.²⁴

The authors have previously reported on the prevalence of TMD, headaches, and cervical pain among women in a Sami population.^{25,26} Symptoms were frequently reported, there was comorbidity, and the prevalence was strongly dependent on criteria of frequency and intensity. The reasons behind the large discrepancy between the prevalence of TMD in the population and treatment demand are essentially not known. An objective of this study was to analyze which factors related to symptom quality (ie, frequency, intensity, and duration) affected these women's perception of related impact on their daily life, if any. Since TMD in several studies have shown a declining pattern with age, another objective was to analyze if age affected the prevalence of TMD symptoms, headaches, and NSP in this sample of Sami women. Most studies on how TMD symptoms may affect the individual are focused on patient samples, while populations-based samples are sparser and there is to the authors' knowledge none based on the Sami population.

The aims of the present report were to analyze the influence of frequency, intensity, and duration of TMD, headaches, and NSP on Sami women's daily life. A further aim was to analyze the relationship between these symptoms and age. It was hypothesized that both frequency and the rated intensity of the examined symptoms should be positively corre-

lated with stated negative impact on daily life activities. Another hypothesis was that TMD symptoms, headaches, and NSP would show a similar and declining pattern with age.

Materials and Methods

Study Population

In 2000, all 751 Sami women, 21 to 70 years old, registered either in the Swedish Sami Parliament's electoral register or with the Swedish Board of Agriculture as reindeer owners or reindeer herders and living north of the Arctic circle, in the county of Norrbotten, Sweden, were sent a questionnaire regarding occurrence, intensity, and duration of symptoms in the jaw, face, head, neck, and shoulder region. Twelve questionnaires were returned blank, nine were returned due to unknown address, and one because the respondent had deceased. Altogether, 487 women (65%) agreed to participate and returned a filled-out questionnaire. Their mean age was 40.2 years (standard deviation [SD] 12.9; 21 to 70 years of age). Every third in each 10-year group of the 242 individuals who did not participate were selected for a dropout analysis (in total, 78 individuals). Fourteen were not possible to identify (no phone number could be found), and another 11 could not be contacted despite several attempts. In total, 53 subjects were reached by telephone. The most common reason given by them for not participating was that they never respond to surveys (38% of the dropouts). Thirty subjects agreed to answer some selected questions from the questionnaire. One third reported symptoms of TMD and two thirds reported pain from neck/shoulder region. No significant differences were found in prevalence of symptoms between participants and a sample of dropouts. Detailed description of the study population, dropouts, dropout analysis, and methods has been presented elsewhere.²⁵ The ethics committee of the Faculty of Medicine and Odontology, Umeå University approved the study. Each subject received written information about the study, together with the questionnaire and a postage-free return envelope.

Methods

The questionnaire used focused on the frequency, duration, and intensity of TMD symptoms, headaches, tinnitus, and neck and shoulder pain and related impact on activities of daily living (ADL). The included and specified symptoms of TMD were

tiredness in the jaws; pain in the jaws at rest, during jaw opening, or chewing; temporomandibular joint (TMJ) sounds (clicking or crepitating) during jaw opening or chewing; locking of the jaw during jaw opening; difficulties in opening the jaw wide. Affirmative answers to one or more of these symptoms are in the following referred to as TMD symptoms. Further questions included tinnitus (ear buzz or ear beeps); headaches; neck pain; pain in the shoulder region. To each of these symptoms, the participants answered questions describing symptom frequency, using the following alternatives: No never; No, not now but I have had it previously; Yes, at most once or twice a month; Yes, once or twice a week; Yes, several times a week; Yes, daily. Questions to describe symptom duration offered four alternatives: Less than 1 month; 1 month to 1 year; 1 year to 5 years; More than 5 years. The intensity of each symptom was measured on an 11-point numerical rating scale (NRS). How much the symptoms of each of TMD, headaches, or neck or shoulder pain interfered with ADL was measured, respectively, with the aid of a NRS anchored with “not at all” and “maximal.” An example drawn from the questionnaire is presented in Fig 1.

These types of scales to depict symptom frequency and duration as well as the 11-point NRS are all widely used. The authors wanted to capture the frequency, intensity, and duration for five TMD symptoms common in the clinic. Most questionnaires were focused on pain and its characteristics leaving the rest of the functionally-related symptoms such as jaw tiredness, TMJ sounds, impaired jaw opening, and TMJ locking to more or less dichotomized alternatives. The questionnaire consisted of common questions to test if one or more of the symptoms characteristics (ie, frequency, intensity, duration) posed a significant effect on the subject’s daily life. A blinded clinical examination was carried out to validate if those who emerged as TMD cases in the questionnaire also were regarded as TMD cases in the clinical setting.²⁶

Statistical Analyses

The data analysis was carried out by the authors with SPSS version 17.0 (IBM). Data presented as prevalence was based on the 487 women who participated. Analysis on the impact of TMD symptoms was based on the women who reported TMD symptoms (n = 155) and also stated a related impact of these symptoms on the NRS (n = 142). Thirteen women with TMD symptoms had thus not answered the related question of ADL and were not included in the analysis. Correspondingly, 292 women

Q16. Do you have headaches?

No, never

No, not now but I have had it previously

Yes, at most once or twice a month

Yes, once or twice a week

Yes, several times a week

Yes, daily

If your answer was No, go on to Q17.
If your answer was Yes, continue with Q16a.

Q16a. For how long have you had headaches?

Less than 1 month

1 month to 1 year

1 year to 5 years

More than 5 years

Q16b. Mark with a circle around the figure that best describes your perceived intensity/discomfort level of your headaches.

Not at all 0 1 2 3 4 5 6 7 8 9 10 Maximal

Q16c. Mark with a circle around the figure that best describes how your daily activities are affected by your headaches.

Not at all 0 1 2 3 4 5 6 7 8 9 10 Maximal

Fig 1 An example of questions included in the questionnaire.

reported headaches and 266 of these stated the related impact on the ADL scale, and 269 women reported NSP of whom 263 had stated the impact of the symptoms on daily life.

Multiple logistic regression analysis was used to test the first objective of the possible impact of frequency, intensity, and duration of TMD symptoms, headaches, and NSP, together with age and education, on the daily life among Sami women. This statistical method requires that the dependent variable is dichotomized (0/1). Answers on the ADL scale for TMD were thus dichotomized into those who stated 0 (not at all) and to those who stated > 0. This resulted in an approximately equal split of those with TMD symptoms. Answers on the ADL scale for headaches and NSP were dichotomized into those who stated < 4 and to those who stated ≥ 4. This approach was based on the distribution of the response, creating approximately equal numerical size in both groups.

Before the analysis, the independent variables (symptom frequency, intensity, and duration) were recoded into the following: 0 = no, never/no, not at present; 1 = once or twice a month at most; and 2 = once a week to daily. The duration of each symptom was recoded into the following: 0 = never had symptoms, 1 = < 1 year, and 2 = ≥ 1 year. The intensity for each symptom was recoded into 0 = 0 on NRS, 1 = 1 to 4 on NRS and 2 ≥ 5 on NRS. Education was dichotomized into those who had studied 9 years at most and those with longer education (senior high

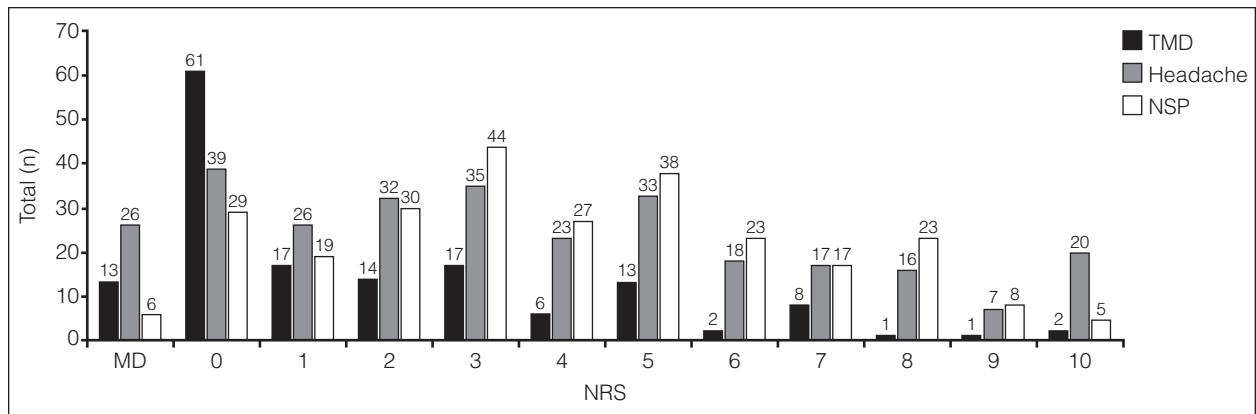


Fig 2 Numerical distribution of the degree to which reported TMD symptoms, headaches, and NSP interfered with daily activities, stated on 11-point NRS, anchored with “0 = not at all” and 10 = “maximal”, among women in a Sami population. The distribution is based on the women who reported affirmatively that they had the respective symptoms. MD = missing data.

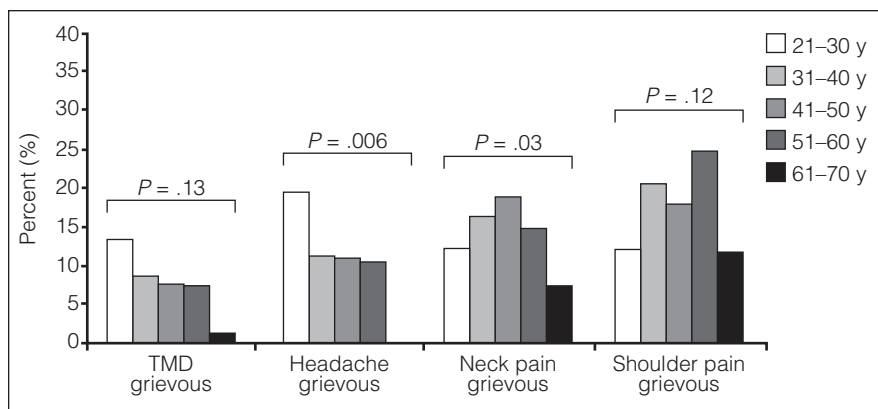


Fig 3 Percentage distribution of grievous symptoms of TMD, headache, neck pain, and shoulder pain, respectively, in five age groups of women in a Sami population (21 to 30 years, n = 82; 31 to 40 years, n = 116; 41 to 50 years, n = 117; 51 to 60 years, n = 105; 61 to 70 years, n = 67). Grievous denotes that symptoms occur at least once a week, with a reported severity level of 5 or more on 11-point NRS and of at least 1-year duration.

school or university). The recoding into fewer groups was done to adjust for the skewed distribution.

In the multiple logistic regression models, answers concerning symptom frequency, intensity, duration, age group, and education were analyzed first factor by factor and then with all significant factors added into the model in a forward likelihood ratio analysis. $P < .05$ was considered statistically significant.

Since the second aim was to analyze the prevalence of frequent and more intensive symptoms in different age groups, the women were for descriptive purposes grouped into five age groups: 21 to 30 years (n = 82), 31 to 40 years (n = 116), 41 to 50 years (n = 117), 51 to 60 years (n = 105), 61 to 70 years (n = 67). Comparison between age groups for presence of different symptoms in the jaw-face, head, and neck-shoulder regions was done with a Chi-square test (second objective). $P < .05$ was considered statistically significant.

Results

TMD

A total of 142 women with TMD symptoms reported their perceived related impairment of daily life on the NRS, and 57% of these (n = 81) noted TMD symptoms to some degree interfered with their daily life (Fig 2). When calculated on the basis of the total sample (487 women), 17% (n = 81) reported that their symptoms in the jaw-face region to some degree disturbed their daily life activities, and for 6% (n = 27) this interference was scored 5 or higher on the NRS. A total of 8% (n = 39) reported longstanding (> 1 year), frequent (once a week or more often) symptoms of TMD, of moderate to severe intensity (≥ 5 on the NRS); of these, 77% (n = 30) stated that the symptoms interfered with

daily life. The prevalence of frequent symptoms of TMD was significantly ($P = .001$) higher among younger women than among older women. The odds ratio (OR) of reporting frequent symptoms of TMD in the 21- to 30-year-old age group as compared to the 61- to 70-year-old age group was 5.8 (95% confidence intervals [CI] 2.1–16). The prevalence of frequent, longstanding, and intense symptoms of TMD showed a gradually declining trend with age, but the difference between age groups was not statistically significant (Fig 3). All who reported frequent jaw pain stated that their daily life was affected by TMD symptoms, compared to approximately half of those with frequent TMJ sounds.

The logistic regression was based on the 142 women who reported TMD symptoms and stated a related impact on the ADL scale. Those with frequent TMJ sounds and a long duration of these sounds dominated among those who reported 0 on the ADL scale for TMD symptoms. The univariate analysis showed that frequency, intensity, and duration of all reported symptoms except frequency of TMJ sounds, frequency, intensity, and duration of TMJ locking, duration of headaches, frequency and duration of tinnitus were significantly related to a statement that symptoms in the jaw-face region influenced daily life (Table 1). In a multivariate analysis including all factors that were statistically significant in the univariate analyses ($P < .05$), four factors remained in the model: low education level (OR 0.18; 95% CI 0.05–0.7), intensity of impaired jaw opening (OR 3.3; 95% CI 1.2–9.3), intensity of neck pain (OR 2.5; 95% CI 1.5–4.3), and duration of jaw pain (OR 8.4; 95% CI 2.3–30.6).

Headaches

Forty-seven percent ($n = 227$) of the study population reported that headaches to some degree disturbed their daily activities, and for 23% ($n = 111$) this interference was scored 5 or higher on the NRS (Fig 2). A total of 11% ($n = 53$) reported longstanding (> 1 year), frequent headaches, of moderate to severe intensity (≥ 5 on the NRS); all stated that their headaches interfered with their daily life. The prevalence of this grievous headache was significantly ($P = .006$) higher among younger women than among older women (Fig 3). The prevalence of frequent headaches showed a gradually and statistically significant ($P = .03$) declining trend with age.

Intensity of headaches (OR 13.3; 95% CI 7.1–24.9) and frequency of tiredness in the jaws (OR 2.3; 95% CI 1.4–3.8) were the factors that significantly influenced the subjects' scoring on the ADL scale for headaches in the multivariate forward lo-

gistic regression model based on the 266 women who stated impact of daily life due to headache.

NSP

Forty-eight percent ($n = 234$) of the women reported that NSP to some degree disturbed their daily activities, and for 23% ($n = 114$) this interference was scored 5 or more on the NRS (Fig 2). A total of 21% ($n = 102$) reported longstanding (> 1 year), frequent NSP, of moderate to severe intensity (≥ 5 on NRS), and 97% ($n = 99$) of these women stated that the pain interfered with their activities of daily life. The pattern of frequent pain in the neck and shoulder region showed a gradual increase up to the age of 60, but the difference in relation to age groups was significant ($P = .03$) only for grievous neck pain (Fig 3).

Intensity of pain in the shoulders (OR 4.6; 95% CI 2.7–7.9), intensity of tiredness in the jaws (OR 2.1; 95% CI 1.3–3.4), and intensity of neck pain (OR 1.9; 95% CI 1.2–2.8) significantly influenced the scoring on the ADL scale for NSP in the multivariate forward logistic regression model based on the 263 women who stated impact of daily life due to NSP.

Discussion

This study shows that TMD symptoms, headaches, and NSP can pose a negative impact on many Sami women's daily life. Longstanding jaw pain, impaired jaw-opening capacity, and troublesome neck pain significantly affected the estimate of the impact of TMD symptoms on daily life. The highest prevalence of grievous TMD symptoms, as well as grievous headaches, was noted in the younger age group, and the lowest prevalence among the oldest. Grievous shoulder pain was most common in the group 51 to 60 years of age.

The Impact of TMD Symptoms

Approximately one sixth stated that their TMD symptoms to some degree interfered with daily life and the most common symptom among these individuals was frequent, severe jaw pain of long duration. Patients with myofascial pain, arthralgia, or disc displacement without reduction report a higher impairment than patients with disc displacement with reduction,^{16,20,24,27} indicating that pain has a significant impact on individual well-being. In a recent review on TMD and its relation to oral health-related quality of life (OHRQoL), the

Table 1 Logistic Regression Analysis*

Variables	Univariate			Multivariate model		
	OR	95% CI	P value	OR	95% CI	P value
Dependent variable: TMD impact on daily life						
Independent variables:						
Jaw tiredness						
Frequency	2.1	1.3–3.2	.001			
Intensity	3.1	1.9–5.1	< .001			
Duration	2.2	1.5–3.3	< .001			
Jaw pain						
Frequency	11.3	2.8–46.2	.001			
Intensity	6.9	2.2–21.1	.001			
Duration	7.5	2.2–25	.001	8.4	2.3–30.6	.001
Jaw sounds						
Frequency	0.8	0.5–1.1	.15			
Intensity	1.6	1.0–2.5	.03			
Duration	0.7	0.5–1.0	.04			
Jaw locking						
Frequency	2.1	0.8–5.4	.15			
Intensity	2.5	0.97–6.3	.057			
Duration	1.8	0.9–3.3	.09			
Impaired jaw opening						
Frequency	2.1	1.1–3.9	.02			
Intensity	4.1	1.4–11.8	.008	3.3	1.2–9.3	.03
Duration	2.2	1.2–3.8	.009			
Headaches						
Frequency	2.0	1.2–3.1	.004			
Intensity	1.6	1.1–2.5	.02			
Duration	1.4	1.0–2.0	.08			
Tinnitus						
Frequency	1.5	0.9–2.4	.1			
Intensity	1.8	1.1–3.0	.02			
Duration	1.3	0.9–1.9	.19			
Neck pain						
Frequency	2.2	1.5–3.4	< .001			
Intensity	2.7	1.7–4.1	< .001	2.5	1.5–4.3	< .001
Duration	2.0	1.4–2.9	< .001			
Shoulder pain						
Frequency	2.1	1.4–3.2	.001			
Intensity	1.8	1.2–2.7	.004			
Duration	1.6	1.1–2.4	.01			
Age groups	1.3	0.9–1.7	.12			
Education level (≤ 9 y \geq)	0.3	0.1–1.0	.05	0.18	0.05–0.7	.01

*Reported impact of daily life related to TMD used as dependent variable. Frequency, intensity, and duration of symptoms, age, and education level were included as independent variables. Crude OR and OR after multiple logistic regression analysis (adjusted OR), 95% CI, and *P* values are presented. Included in the analysis were all participants (*n* = 142) who reported symptoms of TMD and reported their interference with activities of daily living on an 11-point NRS.

Frequency: 0 = no, never/no, not at present; 1 = once or twice a month at most; 2 = once a week to daily. Intensity: 0 = 0 on NRS, 1 = 1–4 on NRS and 2 = ≥ 5 on NRS. Duration: 0 = never had symptoms, 1 = < 1 year, and 2 = ≥ 1 year. In the regression analyses, 0 was reference group. Education: ≤ 9 years and > 9 years, respectively. The former was reference group in the analysis. Age: 1 (21 to 30 years), 2 (31 to 40 years), 3 (41 to 50 years), 4 (51 to 60 years), 5 (61 to 70 years). The youngest age group was the reference in the analysis.

authors concluded that nonpainful conditions have less impact on OHRQoL than pain conditions.¹⁷ This conclusion is in accord with the outcome of this study, that is, frequent TMJ sounds dominated among those who reported 0 on the ADL scale for TMD symptoms. With time, most subjects with nonpainful joint sounds may become accustomed to the symptom and thus are less disabled than they would be by continuous or recurrent painful conditions. Schmitter et al reported that patients with myofascial pain used more splints, consulted more physicians, and received more physiotherapy than patients with joint pathology.²⁸

In an epidemiologic study comparing back pain, headache, abdominal pain, chest pain, and facial pain, 9% to 40% of subjects reported that pain had disabled them from carrying out normal daily activities 1 or more days during a 6-month period. The study also showed that 14% of those with facial pain and 48% of those with severe headaches reported that, at times, they were unable to carry on some activities because of the pain.⁹ While the present study did not examine disability, the results of impairment of daily life were similar. Sleep disturbances, impaired mood, and difficulties in chewing are other possible consequences of TMD pain.¹⁵ Even children with TMD symptoms report impaired quality of life, limited physical activities, and effects on their schoolwork and activities with friends.²⁹ A higher absence from school and higher consumption of over-the-counter analgesics among adolescents with TMD pain were noted in a Swedish sample.³⁰ It should thus be recognized that symptoms of TMD have negative consequences for the quality of life^{16,17} for those affected.

Mutual Impact of TMD Symptoms, Headaches, and Neck Pain

The study showed that the estimate on the ADL scale for TMD symptoms was influenced by intensity of pain in the neck, the estimate on the ADL scale for headache was affected by frequency and intensity of fatigue in the jaws, and the estimate on the ADL scale for NSP was influenced by intensity of fatigue in the jaws. The results support the view that symptoms in this region are closely interrelated. Many studies have shown comorbidity between TMD and headaches,^{25,31-34} and pain in the temples is also included as a TMD symptom in the Research Diagnostic Criteria for TMD.³⁵ In a recent study, severity of painful TMD was significantly associated with increased frequency of temple headaches.³⁶ The severity of pain in the spinal region has been shown to affect the prevalence of

TMD symptoms (both pain and dysfunction) in a dose-response pattern and vice versa.³⁷ Reciprocity has also been found between the incidence of spinal pain and TMD signs in a prospective study on university students.³⁴ Several experimental pain studies have likewise shown that stimulation of one area (trigeminal or spinal) affects the other.^{38,39} In healthy subjects, the temporal coordination between the neck and the jaw system is high during normal jaw opening-closing movements^{40,41} but is hampered in patients with a whiplash-associated disorder.⁴² To the authors' knowledge, this is for the first time that the individual's cognition of the symptoms' interference with their daily life (which may indicate a higher state of severity) shares the similar pattern of mutual impact between trigeminal and spinal areas. The study thus supports the results from a recent study that found a strong relationship between neck disability and jaw disability in a convenience sample based on subjects who attended a TMD/orofacial pain clinic and healthy subjects.⁴³

Influence of Age on the Symptoms Prevalence

In the present study, age was inversely related to the presence of frequent as well as grievous TMD symptoms and headaches but not to the stated related impairment. The prevalence pattern of these symptoms in relation to age was also quite similar, indicating a shared etiology. The lowest prevalence of the examined pain conditions was found in the oldest age group. Previous studies have found that older individuals tend to report TMD symptoms less often than younger ones.^{44,45} Young and middle-aged groups reported the highest headache prevalence and thereafter it declined with age.²³ In an epidemiologic study on pain conditions, the prevalence of headache and facial pain among women peaked in the 25- to 44-year-old period and was lowest among the 65 and older group.⁹ Changes in levels of sex hormones after menopause have been proposed to explain the commonly found pattern of lower prevalence of pain among older women as compared to those of fertile ages.^{46,47} Higher stress levels and related behavior among younger women as compared with elderly women have also been offered as explanations.⁴⁸ The causes are complex and probably related to both external and internal factors. It may be speculated whether differences in lifestyle between elderly and younger generations of Sami women also may account for some of the differences in pain prevalence. Physical activity was a more normal part of the Sami daily life in the 1930s to 1950s than today.⁴⁹ A sedentary life in front of a computer constitutes a part of a normal weekday

among many of the younger generation, which may constitute a risk factor for increased symptoms in the neck, shoulders, and TMD.⁵⁰ Two previous studies have shown that older TMD patients reported a greater negative impact on quality of life.^{16,24} In the present study, grievous TMD symptoms showed a declining pattern with age but the stated impact of daily life owing to TMD symptoms did not differ significantly between the included age groups.

Methodologic Considerations

The choice to exclusively study women was based on the fact that TMD symptoms, headaches, and NSP are more common in women.⁵¹⁻⁵³ The authors wanted to address their research questions to a fairly homogeneous study population and chose the Sami community to explore how these symptoms affected their daily life. The Sami population as such may be viewed as a fairly homogeneous group from the perspective that they share culture, traditions, resources, language, and to some extent, genetics. Previously, marriage within the Sami community was more the rule than the exception. Today, the Sami population participates in all parts of the labor market, and marriage within the Sami group is not a necessity.⁵⁴ Thus, the study population can be considered a fairly homogeneous sample in the sense that they are all women who share the Sami heritage and living in the Swedish Arctic region. In common with most other cultures, women in the Sami community traditionally have a greater responsibility than men in the care of their children and household chores. Responsibility for the products of the reindeer-herding enterprise, such as food and materials for sewing clothes, has traditionally been among the Sami women's duties.⁵⁴ Only the oldest women in this population, however, had experience of a more traditional nomadic way of living.

A part of the questionnaire was structured around questions about a defined set of symptoms and their occurrence, intensity and duration. Since the conditions examined have a fairly high prevalence, the size of the study population should make the estimates quite accurate. Because the dropout analysis did not indicate any systematic error related to the questions to be analyzed, the study results can be considered reliable. In register-based studies such as this, the risk of sampling error is small since all available individuals were used from the register. The register represents a clearly biased group in relation to the total (eg, Swedish) population. In this study, neither the mean value nor the standard error is expected to drastically change by a couple of additional samples.

An 11-point NRS was used to assess symptom intensity as well as impairment related to TMD symptoms, headaches, and NSP. Rating scales have been extensively used to capture pain intensity and shown to have an acceptable reliability⁵⁵⁻⁵⁷ and the advantage of also being easy to understand.⁵⁸ One drawback of rating scales is that the individual's interpretation of the scale may differ, and thus, inter-individual comparisons are scarce. The scales can also be criticized for being one-dimensional. The study was conducted in 2000. Since then, several validated multiple item scales such as the Oral Health Impact Profile⁵⁹ and jaw functional limitation scale⁶⁰ have come into use, but the Swedish versions were not available at that time. The delicate balance between the number of questions included in a questionnaire and expected number of those who are willing to take the time to answer all the questions in population-based studies influenced questionnaire design. The validity of NRS to capture degree of impact of daily life is not known but the authors consider it to be fairly relevant in the dichotomized way that was used in the analysis (ie, those who rated 1 or more on the scales indicated some interference with their daily life related to TMD symptoms, and those who chose 0 indicated that the symptoms did not bother them at all). In the statistical analyses, the dependent variable was constituted of an approximately equal split of those with and without impairment related to TMD symptoms. In the corresponding analyses of impairment related to headaches and NSP, the dichotomizing split was simply based on the distribution of the response, also creating an approximately equal numerical size in both groups. In the graded chronic pain scale,⁶¹ the pain scores are dichotomized on the lower (< 5) and higher (≥ 5) levels. The split in this sample may thus be interpreted as those with a lower and a higher impairment related to headaches and NSP, respectively.

Conclusions

This study has shown that frequency, intensity, and duration of pain in the jaw-face region influenced Sami women's perceived impairment of daily life related to TMD together with neck pain and impaired jaw opening. The prevalence of TMD symptoms diminished with age, but the related interference with daily living did not. More women reported impairment related to headaches and NSP than to TMD symptoms. The major part of those who indicated a more significant impact of daily life related to TMD also indicated significant impact owing to headache

and NSP. For management of patients with TMD symptoms and related impairment, other pain conditions as well as dysfunction in the jaw system for patients with headaches and NSP should be taken into consideration.

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