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ORIGINAL ARTICLE

Self-reportance of temporomandibular disorders in adult patients attending general dental practice in Sweden from 2011 to 2013

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ABSTRACT

Objectives: The study aim was to evaluate the prevalence of self-reported temporomandibular disorders (TMD) and acceptance or nonacceptance of such disorders in adult patients attending all public dental health services in the County of Sörmland, Sweden, during a 3-year period, 2011–2013.

Methods: Two questions were asked about TMD and the voluntary mouth-opening capacity was measured. The results were registered in a score 0–3. The registration was completed with a question about each patient's acceptance or nonacceptance of their condition.

Results: More than 73,000 registrations of the TMD condition were performed in general dental clinics from 2011 to 2013. The mean prevalence of a TMD score of 1–3 was 5% and was consistent over these years. Seventy percent of these patients were women. The peak prevalence of TMD was registered in patients aged 30–45 years (38%), and the frequency declined in older age groups. Reduced voluntary mouth-opening capacity ($\leq$35 mm) was found in less than 2% of the participants. About one-fifth of the patients with a TMD-score of 1–3 did not accept their condition and wanted professional care. The frequency of nonacceptance of the condition increased with the severity of symptom score: 15%, 27%, and 49% for scores 1, 2, and 3, respectively.

Conclusions: This study shows that the prevalence of self-reported TMD in adult patients was consistent from 2011 to 2013 and should be considered as a public health issue in Sweden. Patients with more severe TMD pain symptoms wanted care more frequent. The annual clinical calibrations should be continued to achieve an acceptable level of registration.

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Introduction

Temporomandibular disorders (TMD) refer to pain and dysfunction in the temporomandibular system and its muscles, joints, and associated structures [1]. A wide range of prevalence, 4%–15%, has been reported in epidemiological studies of adults [2–4]. This wide variation in prevalence reflects a lack of consensus regarding the taxonomy, classification, and diagnostic criteria for TMD [4].

The presence of a disorder does not necessarily imply that the patient wants to be treated [5]. A meta-analysis showed an estimated treatment need of 15% of patients with TMD [6]. However, there was a pronounced variation in the prevalence and treatment need, which depended on the different criteria applied when defining TMD and selecting subjects [6].

To optimize the delivery of care for patients with TMD, it is important to estimate the prevalence and treatment need in the general population accurately and continuously. The subjects' perception (i.e. acceptance or nonacceptance), which may indicate the need for treatment, is important in care planning. Data are available on the prevalence of TMD, however there is a lack of statistics concerning the patient's subjective acceptance of their TMD conditions and treatment need in the Swedish population of adults receiving regular dental care.

Aim

The study aim was to describe and analyze the prevalence of self-reported TMD, and acceptance or nonacceptance of the condition among adults attending dental care in the general dental practice setting from 2011 to 2013.

Methods

The study comprised all adults (144,000), aged 20 years or older, who attended all 16 Public Dental Service (PDS) clinics in the County of Sörmland, Sweden, for routine dental examination from 2011 to 2013. The County of Sörmland is a mixture of urban and rural areas and had about 210,000 inhabitants aged 20 years or older during this period. It is considered to be a representative area of Sweden. The recall

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system of the 16 PDS clinics included about 76,000 adult patients who attended annually or biannually for routine dental examination.

Two questions were used for screening TMD among the patients coming for routine dental examination. The questions have shown very good reliability when used among adolescents [7]. The first question was used to screen for TMD pain and is based on the diagnostic criteria in the Research Diagnostic Criteria/TMD (RDC/TMD) [1]. The second question investigates the function of the masticatory system, which is used both in the RDC/TMD and the American Academy of Orofacial Pain (AAOP) [8]. The implementation of the two questions for adults in this county was based on a study that concluded the usefulness of these questions for detecting and recording TMD [9].

Before the start of the study, the routine of screening TMD was implemented to all personnel at the clinics. The registrations were not mandatory, but voluntary in order to identify the implementation degree of this added part to the regular dental examination in general dentistry. The information was provided by the responsible senior consultant in stomatognathic physiology/orofacial pain at all visits to each clinic from 2010 to 2013.

The dentists and dental hygienists who performed the examinations were all individually trained and calibrated [10] with each other and with the responsible senior consultant. All clinics started the registration routine on 1 September 2010, and recalibration was repeated every year. The registration routine comprised three parts.

1. The subjects were asked the standardized two questions (Q1): 'Do you have pain in your temples, face, jaw joint, or jaws, once a week or more often?' and (Q2): 'Do you have pain when you open your mouth wide or chew, once a week or more often?' The answer options were 'Yes or No'. To avoid misunderstanding, at the time of questioning, a diagram of the face was used to indicate the relevant sites.
2. Clinical measurement of maximum mouth-opening capacity and overbite were performed with a ruler, and referred to as the mouth-opening capacity in millimeters. The patients were instructed to open their mouth as widely as possible, even if this hurt. The lower limit for normal mouth-opening capacity was set at >35 mm, in accordance with the proposed criteria for 'limited opening capacity' in the RDC/TMD [1].
3. One question was asked about the patient's acceptance or nonacceptance of his/her condition: (Q3) 'Do you accept your situation?' with yes or no as option.

The responses to Q1 and Q2 as well as the mouth-opening capacity were summarized as the TMD-score on a scale of 0–3 for dysfunction and pain. In this scale, 0 represents no pain or dysfunction; 1 represents no pain but dysfunction (limited opening capacity); 2 represents pain but no dysfunction; and 3 represents pain and dysfunction. If a patient responded 'no' to Q2 but experienced pain on mouth opening, the response to Q2 was changed to 'yes'. If the TMD-score was 1–3, the patient was asked about his/her acceptance of the condition. Those who found their condition unacceptable because it detracted from their quality of life were offered active treatment.

The TMD-score and voluntary mouth-opening capacity were recorded in the computerized clinical record system.

Table 1. Number and percentages of registrations.

Year	2011	2012	2013	2011–2013
Number of care seekers	48,826	45,309	49,520	143,655
Registrations, *n* (%)	28,681 (59)	28,082 (62)	17,007 (34)	73,770 (51)

Ethical considerations

An earlier as well as this study of the TMD [9] were approved by the regional ethics committee in Stockholm (Dnr 2008/1670-31/4) and were undertaken in conformity with the Declaration of Helsinki. All recordings were unidentified from the computerized recording system and were analyzed at the group level.

Results

The numbers and percentages of registrations are presented in Table 1. On average for the three years, 51% of all adults attending the clinics for dental care were registered for TMD, and 52% were women. The prevalence of a TMD-score of 1–3 was 5% during the years 2011–2013; the prevalence of a score of 3, which indicated a more severe condition, was lower (Table 2). TMD was most frequent in the age group 30–45 years (38%) and in women (70%; Table 2).

The frequency of subjective nonacceptance of the condition increased with the severity of symptoms: 15%, 27%, and 49% for those with a TMD-score of 1, 2, and 3, respectively (Table 3).

The mean maximum voluntary mouth-opening capacity, which was used as a measure of jaw function, was 50.2 mm (SD 6.8 mm) during the 3-year study. Less than 2% of all participants had a capacity of $\leq$35 mm (Table 4).

Discussion

The prevalence of a TMD-score of 1–3 remained constant at 5% over the 3 years of the study, and more women than men were affected. The most frequent TMD of 1–3 was noted in the age group 30–45 years (38%), and a lower frequency was noted in older people. Reduced voluntary mouth-opening capacity ($\leq$35 mm) was found in 1.6% of the patients. About one-fifth of the patients with a TMD did not accept their condition and needed professional care, and this need increased with the severity of the condition.

Earlier epidemiological studies have shown variance in and higher frequencies of TMD [11,12]. The differences in prevalence may reflect differences in the study populations, inclusion criteria, or study design. It is of value to have actual knowledge about the prevalence in planning the care utilities in general as well as special care dentistry.

Table 2. Prevalence of self-reported TMD in the total population and related to gender and age, respectively.

	2011 $N = 28,681$	2012 $N = 28,082$	2013 $N = 17,007$	2011–2013 $N = 73,770$
TMD score				
0	94.7	95.4	95.2	95.1
1	3.6	3.2	3.3	3.4
2	1.4	1.1	1.2	1.2
3	0.3	0.4	0.3	0.3
Score 1–3 of the total number of registrations	5.3	4.6	4.8	4.9
Gender (TMD; 1–3)				
Men	30.1	28.4	31.1	29.7
Women	69.9	71.6	68.9	70.3
Age (TMD; 1–3)				
20–29 years	16.9	17.3	22.2	18.3
30–45 years	36.9	38.5	38.6	37.9
46–60 years	30.5	27.1	25.1	28.1
61–75 years	13.0	14.9	11.3	13.3
≥75 years	2.6	2.1	2.8	2.5

TMD score: 0 = no pain or dysfunction; 1 = no pain, but dysfunction (limited opening capacity); 2 = pain, but no dysfunction; and 3 = pain and dysfunction.

Table 3. Frequency of nonacceptance of self-reported TMD related to severity degree, as indicated by a TMD score 1–3.

TMD score	2011	2012	2013	2011–2013
1	137/1037 (13.2)	141/891 (15.8)	84/561 (15.0)	362/2489 (14.5)
2	115/388 (29.6)	74/312 (23.7)	61/212 (28.8)	250/912 (27.4)
3	37/89 (41.6)	55/101 (54.5)	26/51 (51.0)	118/241 (49.0)
1–3	289/1514 (19.1)	270/1304 (20.7)	171/824 (20.8)	730/3642 (20.0)

TMD score: 0 = no pain or dysfunction; 1 = no pain, but dysfunction (limited opening capacity); 2 = pain, but no dysfunction; and 3 = pain and dysfunction.
The data are expressed as *n*/*N* and (percentage).

Table 4. Maximum voluntary mouth-opening capacity in mm.

	2011 $N = 28,681$	2012 $N = 28,082$	2013 $N = 17,007$	2011–2013 $N = 73,770$
Mean mm (SD)	49.9 (6.9)	50.3 (6.8)	50.4 (6.8)	50.2 (6.8)
<40 mm*	4.9%	4.3%	3.9%	4.4%
≤35 mm*	1.8%	1.5%	1.3%	1.6%

*Percentage of the total number of registrations with reduced mouth-opening capacity.

Because the presence of TMD impairs the quality of life and daily living [13], it is important to implement a screening procedure for identifying this condition, which seems to be overlooked in routine dental care and is often undertreated [14]. One purpose with this project was to implement in the regular dental examination jaw function and registration of temporomandibular disorders, and, to evaluate the use of this screening after 3 years use. All registrations in this study were made voluntary and not mandatory in PDS. We used the same implementation procedure over the 3 years.

Similar to other studies [2,4] and a public health report, more women than men were included in this study [15]. Female gender increases the risk of TMD; this gender effect may be related to biological factors [16,17], genetics [18], psychosocial factors such as coping strategies, social behavioral expectations, and the culture within healthcare institutions toward treating females [19,20]. The prevalence patterns for gender and age are similar to those for migraine, another pain condition in the same anatomical and functional area [21].

The best substitute when a condition has no gold standard for diagnosis is history taking [22]. Similar screening questions may provide one way of identifying TMD and has been tested as an instrument [9]. It was implemented in the PDS clinics of the County of Sörmland to ensure that dental care plans are optimal. These screening questions facilitate the clinical identification of people with self-reported TMD and may be of value when evaluating the care plans for a population. The questions are easy to use in both general practice and specialist care, and has been shown to have good reliability and validity in adolescents [7], and has later been validated in an adult population where it was demonstrated to be a relevant, cost-effective and valid tool for screening of TMD [23].

When this study was planned the discussion about two or three questions as a screening procedure was not yet established. The third question deals, which is used nowadays, about functional impairment in the jaw function that is reduced mouth-opening capacity. In our study we included a clinical examination of mouth opening capacity as a measurement of functional impairment and found a low prevalence of limitation in mouth opening capacity.

If implementation of a new routine is completed to the 80% level, it is considered to be a success [24]. This usually requires time, normally at least 3 years [23]. Important factors for success are positive motivation [24] and that the new clinical routine is relevant to dental care with an aim that is clearly evaluable. Implementation requires an environment that facilitates discussion and allows for individual learning patterns [25]. If the registration process had been mandatory the positive results have probably been: a higher frequency of registrations and thereby probably a more representative result on one hand, but on the other hand the interest from the dental professionals may be lower to the burden of a new additional part of the examination. Other important factors are knowledge about TMD, sufficient time for the clinician to learn and practice, professionally competent teachers [25], and continuous guidance [23]. There was variation over time in the numbers of registrations despite the annual visits to each clinic of the responsible senior consultant in stomatognathic physiology/orofacial pain with calibration in registration procedures. Discussions and calibrations were held to improve registrations in the future. The results of this study

suggest that the annual clinical calibrations should be continued to achieve a higher level of registration.

More than 50% of all adults attending a general dental clinic from 2011 to 2013 were registered with a TMD condition. We did not reach the success level of implementation. However, the prevalence over the 3 years indicates that TMD is a public health issue. The results also show that the prevalence of TMD is similar to that of other public health problems such as fibromyalgia [26] and rheumatoid arthritis [27], and reflects the prevalence of psychosocial illness, stress, anxiety, and depression, which are etiological factors of TMD [2,15].

One limitation of the study is the absence of validation of the index before the study start. However, the questions, Q1 and Q2, were earlier validated in adolescents [7] and have recently been validated for adults [23], which strengthen the results in this study. Another limitation of the study was the number of unregistered attending patients. Recalibration of a routine requires time and resources in the clinic to ensure implementation success, as noted previously [25]. Negative factors that interfere with reaching a higher degree of implementation probably reflect the high patient load at each clinic, circulation of examiners over time, and insufficient calibration of routines. The registrations were not a mandatory part, as are other parts of the digital health declaration in the clinics' digital record system. In this study we had not included the private general dental practitioner in the same catchment area, due to different computerized clinical record system.

As this study did not include a complete clinical examination of the temporomandibular system, it was not possible to differentiate if the patient reports included tension-type headache related to TMD or not.

The main advantage of the TMD recordings is the anchoring of a screening routine in general dentistry, which enables a greater degree of cooperation with the specialist care center (senior consultants) when dental care plans are made and evaluated to deliver a good and safe care.

In this study, after identification of the self-reported TMD, a question about accepting or nonaccepting the condition was included with the aim to get an indication of the subjective need for care and treatment. This question focused on the patient's subjective experience, which is affected by the biopsychosocial framework; for example by cognitive, affective, and behavioral factors (importance of subjective well-being, worry, interference with daily living) and available resources (health system, social support, coping styles), and results in care-seeking, self-care, or avoidance [5]. To our knowledge, the term has not previously been applied with reference to TMD and the present study has to be seen as a pilot study. Further research is needed on its validity and why patients accept dysfunction but not pain.

One-fifth of the patients found their condition to be unacceptable, mainly those with the most severe symptoms, as reflected in a TMD-score of 3 with 49%. Prevalence includes people with new problems and those with long-standing conditions. In this analysis, we could not distinguish between these two, and more studies are needed to understand the need for further treatment. As in earlier studies, it seems important to offer further examination and treatment to these patients to decrease the risk of them developing a more severe condition or chronicity [28,29].

We conclude that the prevalence of TMD in this population during the period 2011–2013 should be considered a public health issue in Sweden. The highest prevalence was in the middle-aged group and in women. Patients with more severe symptoms wanted care more frequent. The annual clinical calibrations should be continued to achieve an acceptable level of registrations.

Disclosure statement

No potential conflict of interest was reported by the authors.

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