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Psychological screening of temporomandibular disorder patients

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Chapter 1

General Introduction

The term ‘temporomandibular disorder’ (TMD) refers to a number of different symptoms, located in the joints of the jaw, and in the tendons and muscles surrounding the joints. The most common symptoms are pain and muscle tenderness. Non-pain TMD complaints include deviations or restricted range of mandibular motion, and joint sounds, like clicking or crepitation (for a review see de Leeuw, 2008). TMD, like most other physical, and more particularly, pain disorders, is affected by psychological factors. However, the exact nature of the relationship between physical and psychological factors is not yet known; psychological factors may either precede, interact with, or may be the result of pain (Dworkin, 2006).

The masticatory system is a complicated anatomical structure that allows for a variety of different tasks (Bates et al., 1976). The jaw muscles are the most powerful, and simultaneously finely coordinated muscles in the body. While movements of the jaw enable us to chew food, and to swallow solids and liquids, they also enable us to speak and to communicate nonverbally (Curtis, 2011). The masticatory system is well-capable of performing these vital functions, but it is also vulnerable. Its delicate mechanism may be disturbed by hereditary factors, chewing habits, age, and different types of - possibly stress-related - oral parafunctions (Glaros & Rao, 1977; Sonnesen & Svensson, 2008; Svensson et al., 2008; Weijenberg et al., 2011). The mouth is clearly visible, so that its appearance may become an issue in social interactions. This may then lead to the development of habits, or the seeking of treatments, which, in turn, may be stressful for the jaws. Some people keep their lower jaw pushed forward at all times, as to compensate for an underdeveloped lower jaw, the so-called Sunday bite. Others may undergo major maxillofacial surgery and orthodontic treatment for aesthetic reasons, which may burden the jaw (Bays & Bouloux, 2003; Michelotti & Iodice, 2010). Nevertheless, little is still known about which of the factors mentioned accounts for the development of TMD. There is also no explanation why the amount of pain intensity that is experienced by the patient is seldom proportional to the pathophysiologic changes detected, nor why some patients seem to be bothered by pain or dysfunction of the jaws so much more than others (Ohrbach, 2010).

In the past decades, several different systems for the diagnosis of TMD have been in use, each presenting its own assumptions and vocabulary (Dworkin & le Resche, 1992). They thus lacked conformity and made mutual comparisons and exchange of data difficult. The introduction of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) guidelines in 1992 was a tremendous step forward to better define the signs and symptoms of TMD (Dworkin & Le Resche, 1992). They provided a well-defined and reliable system of data collecting, which opened the possibility for international researchers to exchange and compare their study results. The RDC/TMD were based on diagnostic systems that were developed in other areas of medicine, in particular in those concerning pain syndromes (Turk & Rudy, 1987; 1988; Von Korff et al., 1990). Following these developments, the RDC/TMD include a systematic approach for the assessment of not only physical symptoms, but also of psychological and behavioral factors, relevant for TMD. This dual-axis system, which allows the physical symptoms to be assessed on axis I, and the screening of psychological and behavioral factors on Axis II, reflects the biopsychosocial model, that was developed in 1977 (Engel, 1977). The studies reported in this thesis all concern the RDC/TMD axis II.

RDC/TMD axis II

The most common symptom for which patients visit a TMD clinic is pain. The RDC/TMD axis II includes four measures with which to assess and classify global pain severity: (1) TMD pain intensity; (2) TMD pain-related disability; (3) depression; and (4) nonspecific physical symptoms. Pain-related disability refers to the degree in which individuals are unable to carry out their usual activities as a result of their pain. To classify the degree in which TMD pain patients are impaired by their pain, Von Korff et al. (1992) defined the graded chronic pain (GCP) classification in which the elements of pain intensity and pain-related disability are combined. Patients with a high, degree of disability are often psychologically impaired as well and are more often frequent users of health care than patients with low disability scores (Manfredini et al., 2010). For the assessment of signs of depression and nonspecific physical symptoms, the Symptom Checklist-90 (SCL90) scales of depression and somatisation are used.

In addition to these four measures of the RDC/TMD axis II, a brief jaw disability checklist was included to assess the extent in which the TMD complaints interfere with the normal functions of the jaw, like eating, swallowing, and talking. Finally, in order to study other, possibly relevant risk factors, it was also recommended to collect standard information about the patients' demographic background (viz., age, gender, race, education, marital status, and income level) and other patient characteristics, including possible risk factors like oral parafunctions.

The RDC/TMD have officially been translated and culturally adapted in many different languages (see the website of the International RDC/TMD Consortium: rdc-tmdinternational.org). The Dutch translation was completed in 2005 (Lobbezoo et al., 2005). To assess symptoms of depression and somatisation, in The Netherlands the already translated and validated Dutch version of the SCL90 was selected (Arrindel & Ettema, 1986).

Both at the TMD clinic of the Academic Centre for Dentistry Amsterdam (ACTA) and at the TMD department of the Centre for Special Dental Care (SBT), for many years, RDC/TMD questionnaires were collected from their TMD patient populations. With these questionnaires, analyses of data of large groups of patients were possible. For clinical purposes, the questionnaires are used to get an impression of the presence and severity of psychological factors present in the individual TMD patient's history. On the basis of these questionnaire data and of the impression of the dentist, the treatment team discusses the necessity of inviting the patient for a consultation with the psychologist. The questionnaires thus function as a first screening instrument for psychological factors.

In this thesis, five studies will be reported. The general objective of these studies was to contribute to the evaluation of sections of the axis II questionnaire (chapters 2 and 4), and to the translation/development and statistical testing of new assessment tools (chapters 3, 5, and 6).

Oral Parafunctions

One of the behavioral risk factors of TMD, formulated in the RDC/TMD, are oral parafunctions. These are activities that use the muscles of the jaw for other than the basic functions like chewing, swallowing, and talking. The most frequently occurring and well-known of these oral parafunctions is bruxism, which was defined as ‘diurnal or nocturnal parafunctional activity, including clenching, bracing, gnashing, and grinding of the teeth’ (AAOP, 1996; de Leeuw, 2008). Other examples of oral parafunctions include nail biting, playing and pushing with the tongue, and gum chewing. Oral parafunctions are widely reported, and frequencies of 6 – 20% of the people in the general population, who report clenching and grinding, are found, while the percentages in TMD-patient populations are much higher, even up to almost 90% (Manfredini et al., 2003). This has resulted in the hypothesis that oral parafunctions may be responsible for TMD complaints. However, studies about the relationship between oral parafunctions and TMD pain have so far led to contradictory results. Some studies showed that higher frequencies of bruxism were associated with higher levels of TMD pain, but other studies found negligible or even inverse relationships between the two (Svensson et al., 2008). Several methods to assess parafunctions-TMD relationships were reported. In some studies, using self-report measures, like questionnaires, diaries, or reports of grinding noises heard by the partners, a positive relationship between TMD pain and bruxism was found (e.g. Ciancaglini et al., 2001; Celić et al., 2002). However, electromyographic or polysomnographic measurement techniques, with which muscle activities could be registered objectively, showed that higher muscle activity was associated with lower, instead of higher pain levels, contradicting the self-report studies (Lavigne et al., 1997; Lobbezoo & Lavigne, 1997; Rompré et al., 2007). Experimental protocols were also used, in which muscle tension was artificially induced, for example by instructions to chew as hard and as long as possible on a piece of gum. In these studies, pain could be evoked, but disappeared shortly afterwards and did not lead to chronic TMD pain (i.e. Clark et al., 1991; Glaros & Burton, 2004). Hence, although from a clinician’s viewpoint it still seems plausible that bruxism and TMD pain are related, at this moment there is no clear evidence that they are. Likewise, it is not known if other, possibly harmful habits like nail biting or lip biting, and pushing or vacuum sucking with the tongue may be risk factors for TMD. In most studies so far, the activities examined were limited to clenching and grinding; other oral parafunctions were not included. In order to further investigate this topic, in chapter 2, a study is reported, in which the relationship between different types of oral parafunctions and TMD pain is examined in Dutch TMD patients.

Illness beliefs and self-efficacy

In health research, it has become abundantly clear that in order to treat patients successfully, their cooperation with the treatment is a first requirement (Ross et al., 2004; Jones et al., 2006). Most patients will comply only (1) if the beliefs they have about their illness is in accordance with the clinician’s views (Leventhal et al., 1992), and (2) if they believe that

treatment will be effective. To this purpose, patients' self-efficacy beliefs should include both the belief that behavior related to their complaints can be unlearned, as well as the belief that they would be capable of accomplishing this if they wanted to (Bandura, 1977; 1997).

For TMD patients, non-invasive and reversible treatment methods are preferred to invasive, irreversible treatments. It has been shown that short-term cognitive behavior treatments, relaxation exercises, in particular of the masticatory muscles, and self-management techniques, are successful in reducing parafunctions and in improving patient's skills to manage their pain complaints successfully (Dworkin et al., 1994; Turner et al., 2006; 2007). Results of cognitive behavior therapy with TMD patients were already shown to be mediated by self-efficacy (Turner et al., 2007). For a TMD patient to comply with a treatment aimed at reducing oral parafunctions, patients should believe that these parafunctions may be harmful to the jaws, that they can be unlearned, and that he or she judges him/herself capable to do so. In chapter 3, TMD patients' illness and self efficacy beliefs about their oral parafunctions are examined. The usefulness of introducing questions relating to this issue in the RDC/TMD questionnaire is discussed.

Ethnicity

Several questions proposed in the RDC/TMD questionnaire are related to demographic information. The purpose of these questions is to examine possible relationships between these factors and TMD, in the same way that age and gender effects are being studied (LeResche, 1997). In the original American-oriented version, subjects are asked about their racial background (choice options were: Aleut, Eskimo, American Indian, Asian or Pacific Islander, Black, White, or other), and their origin or ancestry (Puerto Rican, Cuban, Mexican/Mexicano, Mexican American, Chicano, Other Latin American, Other Spanish, or none of the above). Other questions relate to the level of education and income, again with response options relevant to citizens of the USA, and not to other countries and cultures. Since one of the purposes of the RDC/TMD is to enable comparisons between researchers in different countries, the various translators of the guidelines have had to choose between a literal translation, with meaningless categories, or an adaptation to the local situation, thereby moving away from the original text. In the Dutch translation (Lobbezoo et al., 2005), adaptations to the local situation were made, based on the classification of Statistics Netherlands (CBS).

Only few TMD studies, taking ethnic factors into account, were published until now (Widmalm et al., 1995; Plesh et al., 2005; Reiter et al., 2006; Winocur, et al., 2009). Some associations between ethnic or racial background and TMD were reported, but the results were not controlled for socioeconomic factors, which might have played an interfering role. In chapter 4, a study with Dutch TMD patients is reported, in which the relationships between their ethnic background and other demographic factors on the one hand, and TMD complaints on the other are examined, followed by a critical discussion of the uses and abuses of these potential risk factors in psychological screening questionnaires.

Oral Health-Related Quality of Life

During a recent workshop of the International RDC /TMD Consortium Network in 2009, which aimed at revising the RDC /TMD, it was decided to include a measure of oral health-related quality of life (OHRQoL), and the instrument suggested for that purpose was the Oral Health Impact Profile (OHIP). The World Health Organization (WHO) defined Quality of Life as individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns (WHO, 1997). It is a broad- ranging concept, which can be measured in different ways, for example in terms of a general impression of a person's well-being, or by assessing the impact of specific factors affecting this well-being (Guyatt et al., 1993). The concept of quality of life, which was first introduced in medical settings, was also implemented in dentistry, and several questionnaires measuring Oral Health-Related Quality of Life (OHRQoL) were developed (Cushing et al., 1986; Reisine et al., 1989). In 1994, Slade and Spencer published a study, in which the guidelines of the World Health Organisation (WHO) were used to compose the Oral Health Impact Profile (OHIP-49). In the WHO guidelines, it was proposed to better distinguish between different levels in which the impact of physical problems can be felt. Following this advise, the 49 items of the OHIP contain questions relating to seven different domains: functional limitation, physical and psychological discomfort, physical, psychological and social disability, and handicap (Locker, 1988; Slade & Spencer, 1994). The OHIP has gained large popularity. It has been translated and psychometrically tested in many different countries, and has been used with many different types of dental problems (Slade, 1998; Allen et al., 2001; John et al., 2002; Wong et al., 2002; Jones et al., 2004; Larsson et al., 2004; Segu et al., 2005; Bae et al., 2006; Anjos et al., 2006; Lopez & Baelum, 2006; Szentpétery et al., 2006; Al-Jundi et al., 2007; Saub et al., 2007; Yamazaki et al., 2007). For practical purposes, several abbreviated versions were developed (Slade, 1997; John et al., 2006; Montero et al., 2009; Ravaghi et al., 2010). To include the OHIP in the RDC/TMD axis II it was necessary to develop a Dutch version. In chapter 5, the translation of the OHIP-49 into the Dutch language is described. The psychometric properties of the instrument (OHIP-NL) are examined in a group of denture and implant patients. Following this, two abbreviated versions are tested with TMD patients, and this is reported in chapter 6.

Synopsis

The topic of this thesis is the psychological screening of TMD patients, within the framework of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD). In several chapters, psychological and/or behavioral factors that are expected to be associated with the development and the impact of TMD complaints, are examined. The aims are to evaluate RDC/TMD axis II screening instruments for TMD patients; and to translate/develop, and statistically assess new assessment tools.

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