

FRAMEWORK AND PRE-TESTING METHODOLOGY OF THE QUESTIONNAIRE ABOUT THE PREVALENCE OF MUSCULOSKELETAL DISORDERS AMONG DENTISTS

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Background: The aim of our study was to develop and establish the initial content validity of a new questionnaire as a reliable and valid tool for quantifying dentist-rated musculoskeletal disorders (MDs), and to describe the process, including focus groups used to develop the item content.

Methods: Information from the experts' survey, scientifically literature, and dental practitioners interviews were used as a basis for item generation and definition of structural limitations for a questionnaire that would be practical in dental clinics. Dentists with various musculoskeletal complaints, such as low back, neck, or hand/wrist pain, completed the Questionnaire on Dentist Musculoskeletal Disorders (QDMD) on two occasions to determine test-retest reliability. Informed consent and university clearance were obtained for the study.

Results: This study has gathered answers from 12 physiotherapists and 2 physicians, recruited from 4 different rehabilitation settings, with expertise in pain and disability related to MDs. The statistics analyze of the frequency of responses help us to establish the construction of the 13 items (closed questions) remained for the QDMD. The questionnaire was pretested to a random sample of 20 dental practitioners at baseline and at two weeks after, with a test- retest reliability > 0.80.

Conclusions: The QDMD provides a brief, reliable, and valid measure of dentist-rated MDs in terms of pain and disability. This instrument adapt easily to evaluation and prevention needs for the MDs, in order to adopt required ergonomic principles in dental practice, and to maintain a good functional status for the practitioners, especially by using proper postures in the daily practice.

Key words: *questionnaire, musculoskeletal disorder, dental practitioner*

Background

Musculoskeletal disorders (MSDs) are considered between of the main occupational problems among health care workers. Epidemiological studies have shown that physical factors, such as manual handling, frequent bending and twisting, forceful movements and awkward working postures, are important determinants of MDs [1], therefore becoming a major cause of work-related disability on workers with substantial financial consequences due to workers' compensation and medical expenses [2]. Occupational back pain among dentists had been reported between 37% and more than 55% [2,3]. For other body sites, data on prevalence of musculoskeletal complaints are different, with 44% for neck and 51% for shoulder complaints [4]. Manifold work-related factors have been established as predisposing the disorders, but only a few of these risk factors have been taken into account simultaneously, which makes it difficult to

appreciate the impact of specific risk factors since most studies did not control appropriately for concurrent risk factors. Research has recognized that MDs in dentistry contribute considerably to sick leave, reduced productivity and leaving the profession [5,6]. On dental practitioners the MDs arise from repetitive work activities that normally are not hazardous, but which become hazardous when the tissue loading exceeds its anatomical and physiological limits, leading to development of overuse syndromes, persistence of symptoms thus becoming recurrent or chronic [7,8]. Musculoskeletal pain in dentists was negatively correlated with years of work experience, being hypothesized that more experienced dentists learn to adjust their work posture to avoid such problems, or that those dentists with musculoskeletal problems have left the profession [9,10]. Epidemiological research on symptoms or injuries can be conducted using clinical records, clinical surveys or questionnaires;

surveillance by hospital records rarely accounts for symptoms, sequelae or injuries that are treated by other health practitioners, or does not account for the minor disorders that remain untreated. Retrospective questionnaires are another method of estimating the actual prevalence of musculoskeletal symptoms, which offer a smaller risk of underestimating or even leaving out minor symptoms. Questionnaires are also a good method to obtain information from a large, more representative population sample.

There are numerous studies using questionnaires to collect epidemiological information, but few validated musculoskeletal symptoms survey instruments exist. One of the commonly used tools is the Nordic Musculoskeletal Questionnaire (NMQ), a validated instrument that was originally developed to study the prevalence and impact of work related musculoskeletal symptoms [11]. Another 62-item questionnaire was developed to identify the factors associated with the occurrence of these musculoskeletal symptoms [12]. The review of the literature regarding the work-related musculoskeletal disorders on dental practitioners, revealed that there is a need to develop a simpler and affordable scale that specifically measures and assess the risk factors in order to create prevention strategies for work related pain and symptoms.

The aim of our study was to develop and establish the initial content validity of a new questionnaire as a reliable and valid tool for quantifying dentist-rated musculoskeletal disorders (MDs), and to describe the process, including focus groups used to develop the questions content. The process for creating Questionnaire on Dentist Musculoskeletal Disorders (QDMD) has involved the development of new items to create a questions bank; the method for questions bank development was the focus groups method that help to determine both general themes and specific ideas of participants about particular issues, products, and/or services and can, thus, be used to identify functional activities for new test items [13].

Methods

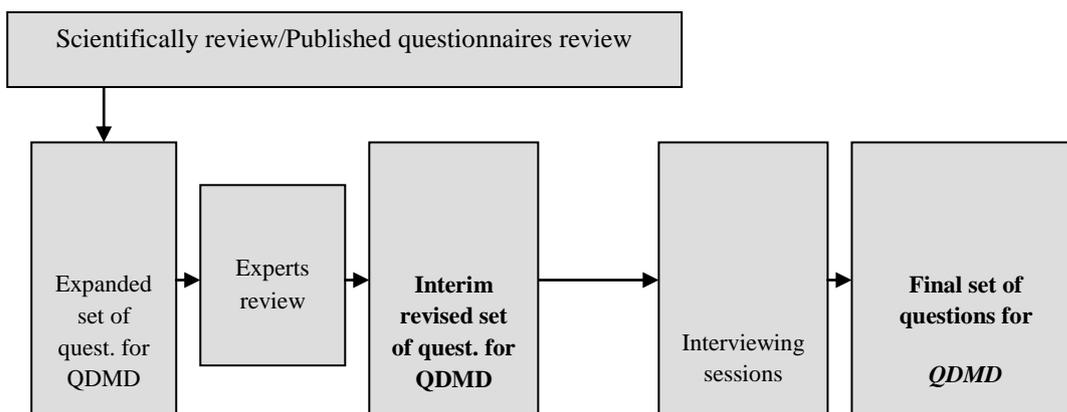
Information from the experts’ survey, scientifically literature, and dental practitioners interviews were used as a basis for item generation and definition of structural limitations for a questionnaire that would be practical in dental clinics.

The process of developing a questions bank for QDMD included two phases.

Phase I, Development of New Questions, included generating of an expanded set of items using a review of existing questionnaires, expert review and focus groups.

Phase II, Questions Revision that includes a series of interviews (Figure 1).

Figure 1 - Development process for QDMD questions content



The study teamwork developed an *expanded set of questions* regarding musculoskeletal symptoms in the previous 24 months.

Subjects and procedure: specialist medical physicians and physiotherapists were recruited from 4 different settings within the medical

rehabilitation and physiotherapy field, including public and private rehabilitation clinics, private practice clinics, and research settings. Physiotherapists were recruited through personal and professional contacts if they satisfied the following criteria: active in

clinical practice and having expertise in musculoskeletal rehabilitation, assessment and measurement of the musculoskeletal complaints, instrument design, validation, and score construction. The expanded set of questions was sent via electronic mail to 12 physical and occupational therapists and 2 physicians, specialists in medical rehabilitation. Via electronic questionnaire, we collected feedback regarding content coverage, content relevance, and individual question clarity.

Instrument: an open-ended questionnaire was designed to investigate what questions are more important to include on this new tool to evaluate occupational risk factors for the dentist-rated musculoskeletal disorders questionnaire. Three of the project team members examined drafts of the questionnaire to ensure completeness, clarity, and applicability. Few minor revisions were made. According to correct procedures for designing questionnaires [14,15] the final draft was pre-tested by the fourth team member, expert physiotherapist, and final minor revisions made. Therapists were provided with the expanded list of questions and asked to respond to the following questions: (a) *Select the 10 most appropriate questions about the dentists clinical practice – weekly working hours, working postures, location of symptoms* (b) *Are there other important risk factors in each domain that should be addressed?*, and (c) *Are the questions written clearly for dental practitioners to understand and respond to?*. Following additions and revisions to the expanded questions bank based on the Phase I feedback, a convenience sample of 6 therapists have been recruited, and the interviewing sessions have been scheduled to establish the final QDMD version.

Dentists with various musculoskeletal complaints, such as low back, neck, or hand/wrist pain, completed the Questionnaire on Dentist Musculoskeletal Disorders (QDMD) on two occasions to determine test-retest reliability. Informed consent and university clearance were obtained for the study. The reliability study was conducted at a

two weeks period, requiring two participant contacts. During the first meeting, the selected version of QDMD was completed, and demographic data were obtained. Participants also read and signed institutional human subject consent forms. Up to 2 weeks later, participants completed the same QDMD version.

Results

This study has gathered answers from 12 physiotherapists and 2 physicians, recruited from 4 different rehabilitation settings, with expertise in pain and disability related to MDs. The statistics analyze of the frequency of responses help us to establish the construction of the 13 items (closed questions) remained for the final version of QDMD.

The questions were coded and statistical analyzed to provide a comprehensive list of issues. A wide range of responses was received like feedback for each question that we propose. Consequently, the questions with fewer responses were omitted showing the selected questions of the QDMD by the previous mentioned specialists for each question in the open-ended questionnaire.

The reliability study was conducted at a two weeks period, requiring two participant contacts. Characteristics of the 20 dentists that agreed to participate to QDMD test-retest reliability study were: 9 females, 11 males, mean age of 36.6 years (SD =5.23, range = 29-45) and a mean of 10.2 years’ experience in dental practice (SD = 3.23; range = 6-16). The questionnaire was pretested to a random sample of 20 dental practitioners at baseline and at two weeks after, with a test- retest reliability > 0.80.

The general questionnaire includes 2 demographic questions (age, sex), and 13 questions about job history, individual aspects regarding their clinical practice – weekly working hours, working postures, if they twist/bend excessively in their activity, whether they repose between patients, physical and psychosocial working risk factors, and the presence of musculoskeletal symptoms – see table 1.

Table 1. Selected questions of the QDMD

Age			
Gender	F	M	
Job history	0-5 years	5-10 years	More than 10 years

How many hours you work per week?	Less than 20 hours	Between 20-40 hours		More than 40 hours	
Which is the Work position adopted	Orthostatic	Sitting, patient seated	Four handed		Alternated
Do you bend/twist excessively for better access to oral cavity?	yes		No		
Do you repose after each treated patient?	yes		No		
Did you experienced symptoms: pain, muscle tensions, fatigue, and discomfort in the previous 24 months?	frequent	occasionally		no	
Which were the risk factors for these symptoms?	Repetitive movements, demanding for upper limbs	Frequent use of vibration hand pieces	Incorrect postures of the body	Prolonged exertion	Lack of restoration, repose or treatment
Which was the location of the symptoms?	Head/neck	Cervical/thorax/lumbar	Shoulder/elbow/hand		Hip/knee/ankle
How often you experience the symptoms	Once a week	Once a month		Once every three months	Rarely
How symptoms interfere with daily activities at work and during leisure time?	mostly		Slightly		
Did you sought for medical assistance for the symptoms?	yes		No		
What treatment did you followed	medical therapy	rehabilitation exercises		physiotherapy	surgical therapy
Do you practice physical activities in your daily routine?	frequent		Occasionally		No

The special questionnaire reveals the presence of musculoskeletal complaints, and focuses on the location of symptoms: head/neck, cervical/thorax/lumbar, shoulder/elbow/hand, hip/knee/ankle, the frequency of symptoms, whether it interfered with daily activities, and the treatment, if they undergone any, the type of medical assistance sought and whether they practice any physical activities.

Conclusions:

The QDMD provides a brief, reliable, and valid measure of dentist-rated MDs in terms of pain and disability. This instrument adapt

easily to evaluation and prevention needs for the MDs, in order to adopt required ergonomic principles in dental practice, and to maintain a good functional status for the practitioners, especially by using proper postures in the daily practice.

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