

## Validation of Stress Screening Questionnaire in Temporomandibular Disorders Patient

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### Abstract

In Indonesia, to determine the presence of emotional stress as a risk factor for temporomandibular disorders (TMD) is still difficult. Although the Research Diagnostic *Criteria* for Temporomandibular Disorders (RDC/TMD) axis II could be used to detect any symptoms of depression but it is not suitable for Indonesian society. The aim of this study was to validate stress screening questionnaire for TMD patients which has been created specifically for Indonesian people by a qualitative study. The design of this study was cross-sectional. It was carried out at the Faculty of Dentistry of the Universitas Indonesia. One hundred sixty patients, aged over 15 years were asked to fill the stress screening questionnaire after they agreed to sign the informed consent. All subjects gave informed consent to procedures approved by the ethics committee of the Faculty of Dentistry. Psychometric properties (reliability and validity) were evaluated on the stress screening questionnaire. After validation test, 6 items were excluded from the stress questionnaire since the items were not fit in the component of it, so the remaining questionnaire consisted of 18 items. Within the questionnaire, the correlation between each item and the total items were strong, ranging from 0.510 to 0.788.

The results of the reliability test of measuring instruments on the questionnaire showed the value of Cronbach's alpha coefficients of 0.915. The 18-item stress questionnaire is a valid and trustworthy tool to detect emotional stress as a risk factor in TMD.

*Clinical article (J Int Dent Med Res 2016; 9: (Special Issue), pp. 272-276)*

**Keywords:** Temporomandibular Disorders, risk factor, stress, questionnaire.

**Received date:** 28 September 2016

**Accept date:** 29 October 2016

### Introduction

Pain is often the primary reason for patients seeking medical or dental care. Temporomandibular disorders (TMD) are musculoskeletal pain conditions characterized by pain in the temporomandibular joint (TMJ) and/or the masticatory muscles. These disorders are often accompanied by other signs and symptoms include limitation or deviation in the mandibular range of motion, and / or TMJ sounds.

Temporomandibular disorders are many occur in the population. In the studies of TMD prevalence have reported that approximately 56% of the population has at least one

detectable sign associated with TMD (women ratio is 4:1), while approximately 41% experience at least one of its symptoms. Epidemiologic studies suggest that TMD symptoms much experienced in the group aged 20-40 years.<sup>1,2</sup>

Physical, psychological and psychosocial factors are recognized as a group of biopsychosocial illnesses. Temporomandibular disorders are one of a group of biopsychosocial illnesses. Psychological factors are known to play an important role in the etiology and maintenance of temporomandibular disorders. They increase the risk of progressing to long-term TMD, which is difficult to manage, and that their role varies depending on gender. In particular, the presence of psychological disorders is more often in the female. Psychological disorders may be experienced by patients with acute and chronic TMD. Therefore it may have an influence on the progression towards chronic TMD.<sup>3</sup>

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Emotional stress is the subjective feeling that is caused by the presence of something that is uncontrollable or threatening. Stress is not part of the situation itself, stress due to how people respond to a particular situation.<sup>4</sup>The role of stress in the etiology of TMD has been studied extensively. Emotional centers of the brain have an influence on muscle function. Increased levels of emotional stress can increase the tonicity of the head and neck muscle and also increase levels of nonfunctional muscle activity, such as bruxism or tooth clenching.<sup>1</sup>

Several studies have shown relationships between major life stressors and temporomandibular disorders. A high incidence of exposure to stressful life events and elevated levels of stress-related somatic symptoms in TMD patients have been reported.<sup>5-7</sup>

In relation to the stress, Dworkin and LeResche created the Research Diagnostic Criteria for Temporomandibular Disorder which was a dual axis approach to the diagnosis of TMD. Axis I of the RDC concentrates on the clinical examination and Axis II focuses on the psychosocial effects of the condition. Axis 1 has the simplest classification groups of TMD. The group is consist of group I (myofascial pain disorder), group II (disc displacement disorder), and group III (degenerative disease disorder). Axis II of the RDC consists of a self-administered questionnaire that the patient completes. The clinician can use this questionnaire, with the scoring system provided, to assess the level of the patient's chronic jaw pain, disability caused by their jaw complaint, depression, and non-specific symptoms.<sup>3,8</sup>

Although RDC/TMD can detect any symptoms of depression, In Indonesia to determine the presence of emotional stress as a risk factor of TMD is still difficult. Indonesia as a developing country needs a simple and reliable tool to determine stress which could be accepted in the culture of Indonesian society. This study was conducted in two stages, the first stage was an exploratory qualitative study. This was done to conduct a structured and in-depth interviews as well as discussions with the experts, to get variables that will be used in the questionnaire based on the etiology of TMD as well as stress as a causative factor of TMD.<sup>9</sup>

The second stage was a quantitative study to prove that it was a valid and reliable. The aim of this study was to validate stress

screening questionnaire that had been built based on a qualitative study in Indonesian TMD patients.

### Materials and methods

This cross-sectional study was carried out at the faculty hospital, Faculty of Dentistry Universitas Indonesia. 160 patients, aged over 15 years, were asked to fill the stress screening questionnaire after they agreed to sign the informed consent. The patient should not suffer from systemic diseases such as systemic rheumatic, neurologic/neuropathic, or autoimmune disease and were not taking certain medications such as muscle relaxants, steroid therapy, antidepressants, not being in radiation therapy for head and neck, did not experience a mental disorder, and never underwent TMJ surgery. These All subjects gave informed consent to procedures approved by the Ethics Committee Faculty of Dentistry.

Items	Criteria		
	Never(0)	Seldom(1)	Often(2)
Do you feel sad because of something not expected to happen?			
Do you feel pain in your head?			
Do you feel weak or loss of balance?			
Do you feel pain in your heart or chest?			
Do you feel excessive worry?			
Do you feel fatigue?			
Do you blame yourself?			
Do you feel easy to cry?			
Do you feel lonely?			
Don't you interested in any?			
Do you have sleep problem?			
Do you feel hopeless for the future?			
Do you feel life has been ended?			
Are you overeating?			
Do you feel unable to control something important in your life?			
Do you feel nervous, confused and depressed?			
Do you feel there is something missing from you?			
Do you find that you can't cope with anything to be done?			
Do you angry because something happen outside of your control?			
Do you find it very difficult to face of something that you can't fix it?			
Do you interrupted sleep?			
Do you feel everything is difficult?			
Do you feel worthless?			
Do you feel guilty?			

**Table 1.** Complete stress screening questionnaire before validity test and reliability test were done.

A self-administrated questionnaire was designed and conducted face to face interviews. Participants were asked to evaluate on a 3 point Likert scale (0=never, 1=seldom, 2=often). Stress screening questionnaire consisted of 24 items (Table 1). Psychometric properties (reliability and

validity) were evaluated. Validity test was done by observing the correlation among the items, also the correlation between each item and the total items. The reliability test was done using Cronbach's alpha coefficient (alpha if item deleted).

## Results

A total of 160 subjects completed the stress screening questionnaire. The characteristics of the subjects were consisting of 111 women (69%) and 49 men (31%), aged ranging from 15-86 were included in this study.

The validity test of the questionnaire showed that the correlation between each item with the total items was weak to strong,  $r = 0.34 - 0.76$ . Weak correlation sequence found on item 2 (do you feel pain in your head?), item 14 (are you overeating?), item 13 (do you feel life has been ended?), item 4 (do you feel pain in your heart or chest?), item 21 (do you interrupted sleep?), and item 11 (do you have sleep problem?). Those sixth items were excluded since they were not fit in the component of the questionnaire.

No	Item	Correlation between items to total score	Cronbach coefficients alpha
1	Do you feel sad because of something not expected to happen?	0.64	0.92
2	Do you feel weak or loss of balance?	0.51	
3	Do you feel excessive worry?	0.70	
4	Do you feel fatigue?	0.55	
5	Do you blame yourself?	0.69	
6	Do you feel easy to cry?	0.57	
7	Do you feel lonely?	0.72	
8	Don't you interested in any?	0.58	
9	Do you feel hopeless for the future?	0.51	
10	Do you feel unable to control something important in your life?	0.66	
11	Do you feel nervous, confused and depressed?	0.79	
12	Do you feel there is something missing from you?	0.69	
13	Do you find that you can't cope with anything to be done?	0.68	
14	Do you angry because something happen outside of your control?	0.64	
15	Do you find it very difficult to face of something that you can't fix it?	0.63	
16	Do you feel everything is difficult?	0.68	
17	Do you feel worthless?	0.59	
18	Do you feel guilty?	0.70	

**Table 2.** Validity and reliability test of the stress questionnaire.

After 6 items were excluded, the remaining questionnaire consisted of 18 items. Analysis after becoming 18 items, showing the range of values between 0.51 to 0.79. The range

of values proved that each item has a strong correlation coefficient of the total value of the components. Meaning of each item was appropriate in the components, so it can be maintained ( Table 2 ).

The reliability test on 24 items stress questionnaire showed the value of Cronbach's alpha coefficients 0.91. These results indicate high internal consistency. The results of testing the reliability of measuring instruments on 18 items stress questionnaire showed the value of Cronbach's alpha coefficients 0.92 ( Table 2 ).

Both Cronbach's alpha coefficients value were close to 1, means that the internal consistency was high and the stress questionnaire was trustworthy (reliable). In other words, the score obtained was not a coincidence, but it truly describes the state of the characteristics to be measured.

## Discussion

It has been reported that patients with temporomandibular disorders experienced twice as many undesirable stressful life events in a 6-month period than did controls and that life event contributed to the onset of TMD in almost 50% of the patients. An increase in stress excites the limbic structures and hypothalamic-pituitary-adrenal (HPA) axis activating the gamma efferent system, resulting in partial stretching of the sensory regions of the muscle spindles. When spindles are partially stretched, less stretching of the overall muscle is necessary to elicit a reflex action. This affects will increase muscle tonus, which often leads to further increases in muscle tonicity and the inter articular pressure of the TMJ.<sup>1,10</sup>

The measurement of stress has been debated whether or not we should limit ourselves to measuring stressors in terms of objective conditions, such as major life events or cumulative minor stressors (eg, daily hassles), or if we should rather concentrate on the person's stress reactions, in terms of their stress appraisal or emotional response. Perceived Stress Scale is one of the most frequently used tools to measure stress in chronic conditions and situations often not listed on other life-event scales<sup>11</sup> however, this scale is not specifically used in TMD patient. The Research Diagnostic Criteria for Temporomandibular Disorder was a dual axis approach to the diagnosis of TMD. Axis II

includes 12 questions to assess the extent to which mandibular function is impaired and 7 questions to assess and classify the globalization of the pain conditions in terms of pain severity and pain-related to disability and interference. In addition, depression and nonspecific physical symptoms are assessed using symptoms checklist.<sup>12,13</sup> Although the RDC/TMD has been widely used in the examination of TMD in some countries, in Indonesia as a developing country need a simple and reliable tool to examines stress as a risk factor of TMD. There for, a qualitative study had been done to create stress screening questionnaire in the first stage study. This questionnaire has a good face and content validity.<sup>9</sup>

This second study showed that it was possible to construct a questionnaire with good psychometric characteristic on stress as a risk factor screening in TMD. Internal consistency of the instrument was high and it proved to have good construct validity. The validation of the questionnaire confirmed that each item was appropriate in the components, therefore, it can be used to determine the presence of emotional stress as a risk factor of TMD.

The sixth items were excluded i.e item 2 (do you feel pain in your head?), item 14 (are you overeating?), item 13 (do you feel life has ended?), item 4 (do you feel the pain in the heart or chest?), item 21 (do you wake up while sleeping?), and item 11 (do you have problems with sleep?), because the items were not fit in the component of the stress questionnaire besides that it couldn't describe the stress on a person cause the questions were not specific.

The successful management of TMD is dependent on identifying and controlling the contributing factors. Psychosocial factors like stress, tension, anxiety and depression may lead to TMD.<sup>14,15</sup> Therefore this questionnaire was designed to easily and quickly detect the presence or absence of stress in TMD patients, especially in Indonesia.

The limitation of this study was in the fact that most of the Indonesian Society were not open for personal data such as their marriage status. For future study, this instrument could be used in different populations, in different cultural and socio-economic setting, to make generalized conclusions on stress as a risk factor of TMD.

## Conclusions

The 18 item stress questionnaire is a valid and trustworthy tool to detect emotional stress as a risk factor in TMD. It is a simple and reliable tool to determine stress which could be accepted in the culture of Indonesian society.

## Acknowledgements

The publication of this manuscript is supported by the Directorate of Research and Community Engagement of the Universitas Indonesia.

## Declaration of Interest

The authors report no conflict of interest.

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