Implementation of TMD pain screening questionnaire in peruvian dental students

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ABSTRACT

The aim of this study was to screen for painful TMD conditions by implementing the validated Axis I screening instrument from the Diagnostic Criteria for Temporomandibular Disorders. Using the screener as a surrogate, the prevalence of the conditions was estimated among a convenience sample of dental students in Peru. A total 2,562 dental students, 63.7% women, aged 18 to 62 completed the instrument. Prevalence was estimated using both the short and long versions. The prevalence of painful TMD conditions was 19.4% with the short and 16.1% with the long version. The distribution of the conditions according to gender differed significantly between groups (p<.001). Prevalence estimates of painful TMD conditions using the screening instrument seems to be logistically adequate in a field assessment involving multiple geographic and cultural regions in Peru. These estimates seem to be consistent with internationally reported values.

Received: November 2018; Accepted: June 2019.

Keywords: *temporomandibular joint disorders; pain; clinical decision-making.*

Implementacion de un cuestionario de triaje para trastornos temporomandibulares asociados al dolor en estudiantes de odontologia peruanos

RESUMEN

El objetivo de este estudio fue tener una estimación de las condiciones de los trastornos temporomandibulares asociados al dolor, mediante la implementación de un instrumento validado de triaje para la medición del Eje I de los Criterios Diagnósticos para los Trastornos Temporomandibulares (CD/TTM). Usando este instrumento como un sustituto, se estimó la prevalencia de estas condiciones en una muestra por conveniencia de estudiantes de Odontología en el Perú. Un total de 2,562 estudiantes de Odontología, 63.7% mujeres, entre las edades de 18 a 62 años de edad, completaron el instrumento. La prevalencia fue estimada empleando las versiones corta y larga del instrumento. La prevalencia de los TTM asociados al dolor fue de 19.4% con la versión corta y 16.1% con la versión larga. La distribución de estas condiciones fue estadísticamente diferente según el sexo (p<.001). El empleo del instrumento de triaje para estimar la prevalencia de los TTMs asociados al dolor parece ser logísticamente adecuado en un escenario de diversas regiones geográficas y culturales en el Perú. Estas estimaciones parecen ser consistentes con valores internacionalmente reportados.

Palabras clave: *trastornos de la articulación temporomandibular; dolor; toma de decisiones clínicas.*

INTRODUCTION

Comprehensive patient care, both in clinical practice and in academic programs, should include assessment of temporomandibular disorders (TMD). Initial identification of TMD-related conditions should be followed by proper referral to a well-trained professional in the field for evidence-based diagnostic procedures and interventions. This conclusion is based on the incorporation of recent knowledge of the paradigmatic shift to modern concepts supporting TMD etiology, progression and treatment that may deviate from preconceived ideas[1,2].

Historically, TMD diagnostic classifications focused on physical findings, with a lack of consistent, operationalized definitions and criteria. This barrier was overcome by the Research Diagnostic Criteria for TMD (RDC/TMD)[3], which introduced a dual axis system: Axis I for clinical diagnoses and Axis II for pain-related disability and psychological status. More recently, the Diagnostic Criteria for Temporomandibular Disorder (DC/TMD) [4] was published as a result of validation study group recommendations and participation of the international community in this field, presenting validated

criteria for the most common TMDs. This new diagnostic classification system maintains a dual axis and provides sensitivity and specificity values to support its clinical validity for clinical implementation. The DC/TMD recommends the implementation of a standardized examination protocol and utilization of self-report instruments, including a TMD-pain screener [5] to be used by clinicians and researchers. The screening instrument, which shows excellent levels of sensitivity and specificity, can be used routinely for identification of individuals with TMDs in population-based research studies if there is limited infrastructure for including examination protocols, or in clinical settings for early identification prior to proceeding on with appropriate referrals.

The aim of this study was to estimate the prevalence of pain-related TMDs, using as a surrogate the screening instrument presented by the DC/TMD, in a nationwide sample of dental students that included different geographic and cultural regions in Peru.

MATERIALS AND METHODS

A total 4967 dental students enrolled for the 3rd to 10th semesters were invited to participate in this field study, of whom 2562 accepted. They came from different cities, representing 21 geographic locations from regions including the coast, the mountains and the Amazon rainforest. Minimal sample size was estimated using prevalence of 40% [6,7], significance level of 95% and a power of 90%. The proportional sampling procedure was used to determine the sample in each location according to the number of students who enrolled. Exclusion criteria included the presence of systemic joint disease, neurological disease or a previously established diagnosis of TMD.

This instrument was first introduced in 2011 [5] and encompasses the report of pain, jaw stiffness, and factors that may modify pain, such as function and parafunction (Fig 1). The Pain screener is the only screener questionnaire included in the Axis I of the most recently published Diagnostic Criteria for Temporomandibular Disorders [4]. Its inclusion is supported by its reliability and validity estimates, which include Internal reliability ranging from 0.87 to 0.93, in addition to sensitivity and specificity values of 99% and 97%, respectively, for correct classification of true positives and true negatives [5].

The protocol was approved by the Research Ethics Committee of Universidad Alas Peruanas, Lima, Peru. All participants signed consent forms prior to participation.

Triaje para Trastornos Temporomandibulares – Dolorosos

1. En los últimos 30 días, ¿cuánto le ha durado cualquier dolor en su mandíbula o sien, en cualquiera de los lados?
   a. Sin dolor
   b. El dolor va y viene (intermitente)
   c. El dolor siempre está presente (constante)
2. ¿En los últimos 30 días ha sentido dolor o rigidez en su mandíbula al despertar?
   a. No
   b. Si
3. En los últimos 30 días, ¿alguna de las siguientes actividades afectó (es decir el dolor mejoró o empeoró) el dolor en su mandíbula o sien en cualquiera de los lados?
   A. Masticando comidas duras o difíciles de triturar.
      a. No
      b. Si
   B. Abrir la boca o mover la mandíbula hacia los lados o hacia el frente.
      a. No
      b. Si
   C. Hábitos orales tales como mantener los dientes juntos, apretar, rechinar los dientes o masticar goma de mascar.
      a. No
      b. Si
   D. Otras actividades mandibulares tales como hablar, besar o bostezar.
      a. No
      b. Si

Fig. 1: TMD pain questionnaire.

RESULTS

A total 2562 individuals participated in the study. The mean age of the sample was 24.06 (± 5.72 SD) with a range of 18 to 62 years. Due to the broad age range, decade categories were established for data analysis. Gender distribution shows that 63.7% of the participants were female; this finding was consistent among the age categories and screening scores by age and gender.

Based on TMD-pain screening, the percentage of individuals identified with painful TMD using the short-version was 19.4%, more specifically, 22.0% for females and 14.7% for males. Using the long version, the estimates were 16.1%, with 19.0% females and 11.0% males (Table 1).

Gender distribution among the age groups was evaluated using corrected chi square (x^2), and statistically significant differences were found for distribution of men and women ($p<.001$). Nevertheless, there was no significant difference in positive results among the age groups using the distribution screener. ($x^2= 2.932$, $p=.710$ for the short version, and $x^2= 3.344$, $p=.647$ for the long version) (Table 1).

Distribution according to university locations and results of the versions of the screener are shown in Figs. 2 and 3.

The female-to-male ratio among the individuals using the TMD-pain screening questionnaire in both versions was 2.82:1. Distribution of the sample according to sex and age group is shown in Table 2.

All the items in the self-reported screenings have two alternative answers: "no" or "yes", except the first, which has three alternative answers, "a", "b" and "c", the first being the negative response. For

Table 1: Percent of cases identified by gender using the Pain -TMD screener.

		n	3-item version		6-item version	
			Negative	Affirmative	Negative	Affirmative
Sex	Male	931	794	137	829	102
			85.3%	14.7%	89.0%	11.0%
	Female	1631	1272	359	1321	310
			78.0%	22.0%	81.0%	19.0%
Total		2562	2066	496	2150	412
			80.6%	19.4%	83.9%	16.1%

Table 2: Distribution of cases by age groups and gender.

Age group	sex		TMD-pain screener positive		sex		TMD-pain screener positive		Total
	Male	%	3-item	6-item	Female	%	3-item	6-item	
16-20	224	30.2%	17.4%	12.9%	518	69.8%	19.3%	18.1%	742
21-25	362	34.8%	17.1%	11.0%	678	65.2%	21.2%	17.7%	1040
26-30	201	39.7%	11.4%	10.0%	305	60.3%	25.3%	22.0%	506
31-35	78	50.3%	10.3%	12.8%	77	49.7%	27.6%	19.5%	155
36-40	39	56.5%	2.6%	2.6%	30	43.5%	26.7%	20.0%	69
more than 40	27	54.0%	14.8%	7.4%	23	46.0%	34.8%	34.8%	50
Total	**931**	**36.3%**	**14.7%**	**11.0%**	**1631**	**63.7%**	**22.0%**	**19.0%**	**2562**

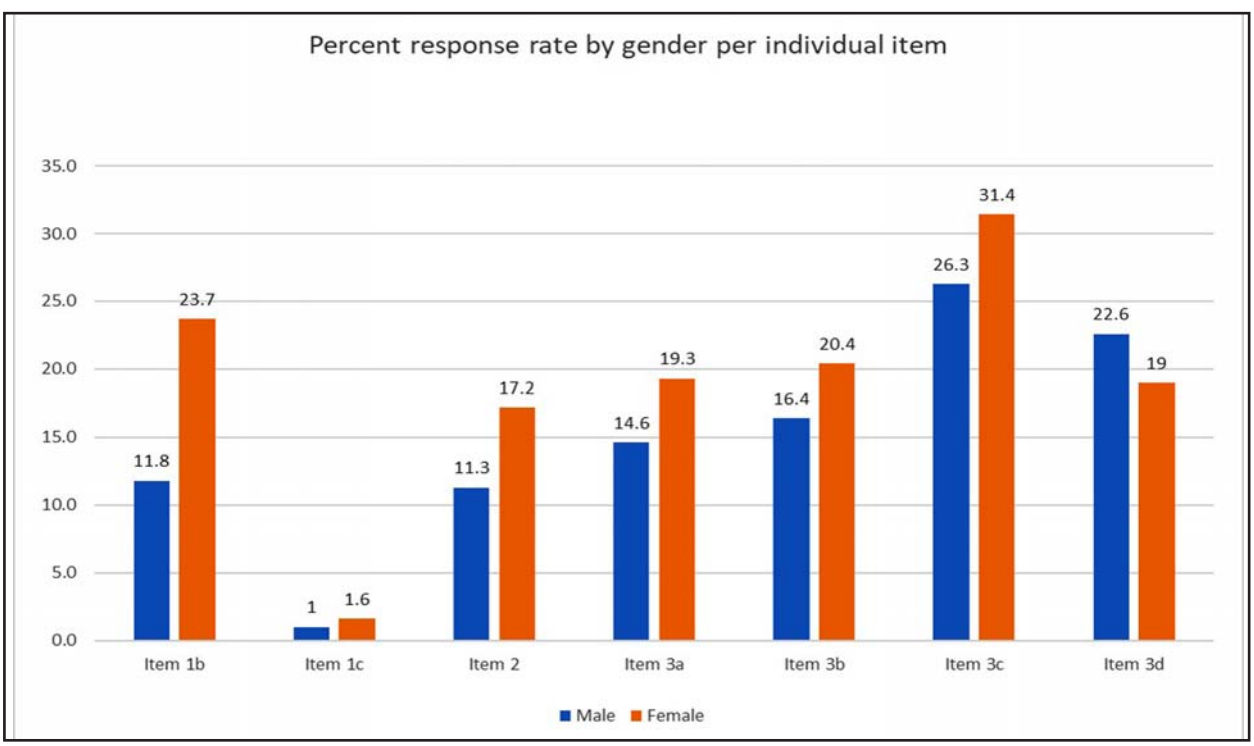

Fig. 2: Percent response rate by gender per individual item.

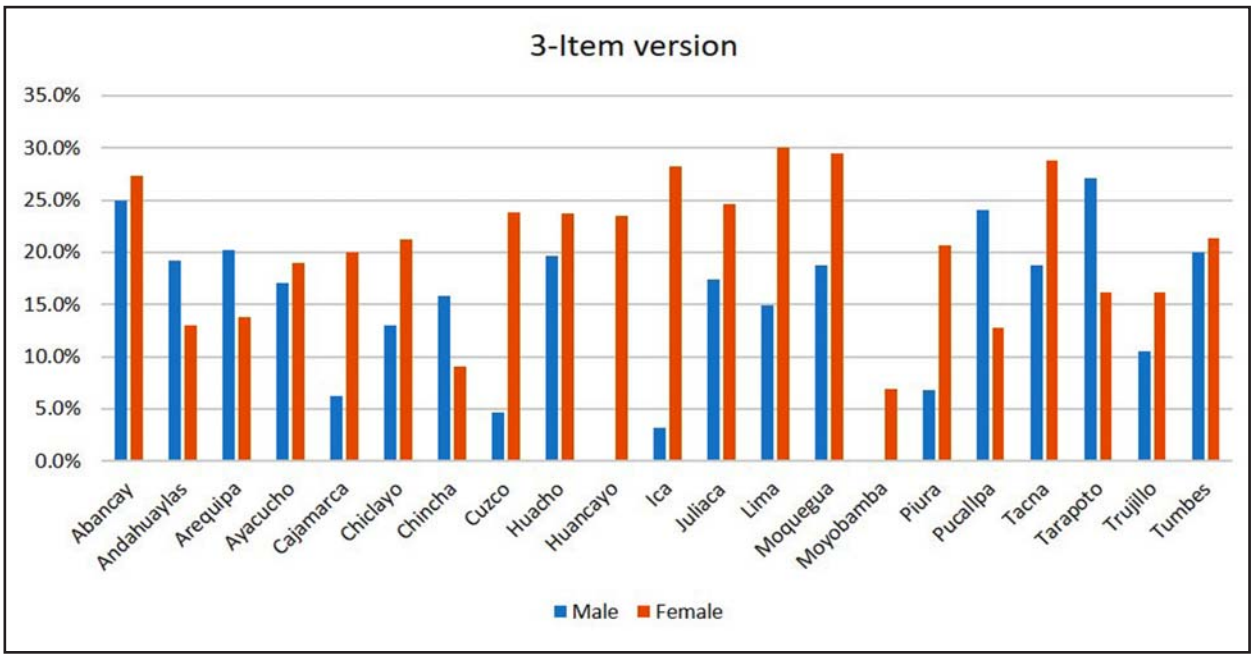

Fig. 3: Percent positive diagnostic allocation by geographic region and gender using the 3-item version of the TMD-Screener.

Table 3: Percent response rate by items.

Item	(n= 2.562)	male (%)	female (%)
1. In the last 30 days, on average, how did long did any pain in your jaw or temple area on either side last?			
a. No pain	2030	40.0	60.5
b. From very brief to more than a week, but it does stop	497	22.1	77.9
c. Continuous	35	25.7	74.3
2. In the last 30 days, have you had pain or stiffness in your jaw upon awakening?			
a. No	2176	38.0	62
b. Yes	386	27.2	72.8
3. In the last 30 days, did the following activities change any pain (that is, make it better or make it worse) in your jaw or temple area on either side?			
A. Chewing hard or tough food			
a. No	2112	37.6	62.4
b. Yes	450	30.2	69.8
B. Opening your mouth or moving your jaw forward or to the side?			
a. No	2077	37.5	62.5
b. Yes	757	32.4	67.6
C. Jaw habits such as holding teeth together, clenching, grinding or chewing gum?			
a. No	1805	38.0	62
b. Yes	757	32.4	67.6
D. Other jaw activities such as talking, kissing or yawning?			
a. No	2042	35.3	10.3
b. Yes	520	40.4	59.62

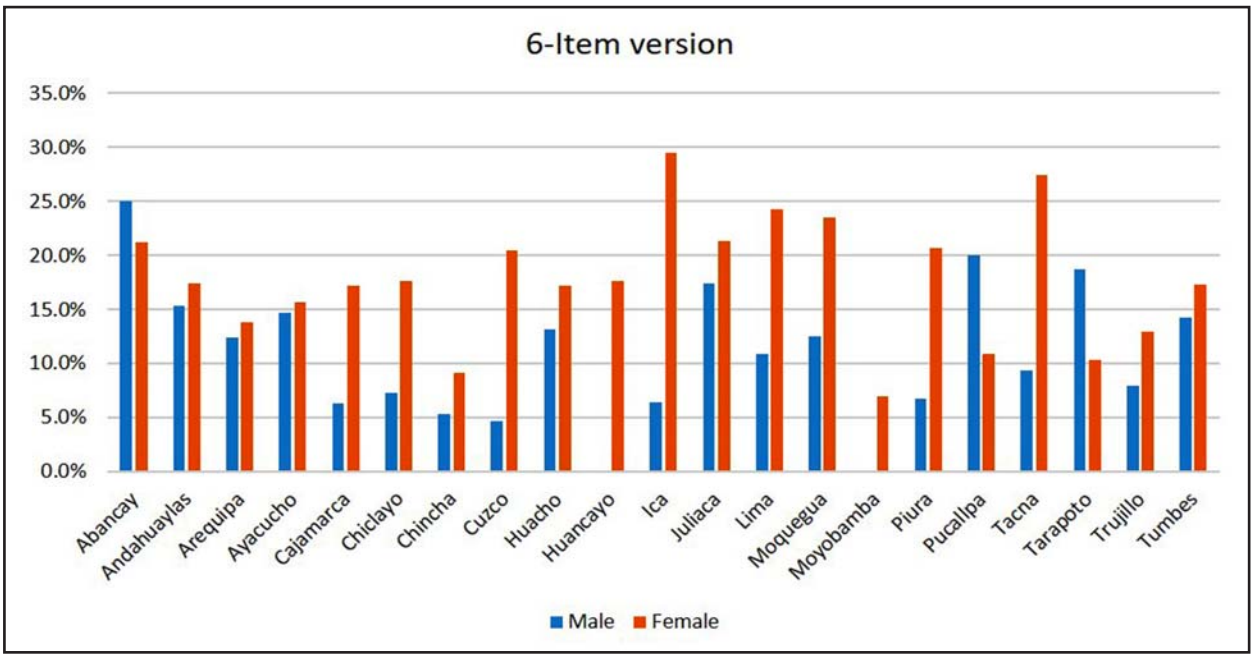

Fig. 4: Percent positive diagnostic allocation by geographic region and gender using the 6-item version of the TMD-Screener.

the first item, 19.4% (497) of all the participants in the study responded affirmatively to alternative "b", and 1.4% (35) responded affirmatively to alternative "c". For item 2, 15.1% (386) responded affirmatively. Of the four conditions included in the third item, 17.6% (450) answered "yes" to the first, and 18.9% (485), 29.5% (757) and 20.3% (520) answered "yes" to numbers 2, 3 and 4, respectively. These results are shown in Table 3.

With regard to the distribution of the responses for the items according to sex, presented in Fig. 2, note that more males than females responded affirmatively only in item 3d.

There was a significant difference in prevalence according to sex in four locations: Abancay, Andahuaylas, Arequipa and Chincha, when comparing the 3-item and 6-item versions (Figs. 3 and 4).

With the 3-item version, male prevalence was noted in Andahuaylas, Arequipa, Chincha, Pucallpa and Tarapoto, but not in Huancayo and Moyobamba. With the 6-item version, male prevalence was found in Abancay, Pucallpa and Tarapoto, but not in Huancayo and Moyobamba. No statistical difference was found in the distribution between TMD and sex with the short version in university locations except in Cuzco, Ica, Lima and Piura. This was also true for the long version, with the addition of Tacna. According to the total results there was a statistical difference ($p<.001$) between TMD and sex in both versions.

Internal consistency of the screener was evaluated in 10% of the sample, and the Cochran alpha Kappa statistic was 0.69.

DISCUSSION

The screener's validity had been previously determined in two versions, with 3 or 6 self-reported items [5]. In the sample evaluated, our main result showed the prevalence of Painful TMD disorders as 19.4% and 16.1% in each version, respectively.

The self-report questions for core symptoms for TMD-pain diagnosis are included in both versions, and address the following: evidence of recent pain and modification of pain by function and parafunction, within the same time frame[5-8].

Using self-report, researchers have implemented field assessment to estimate the prevalence of orofacial pain conditions in representative populations [9],

In the field of TMD, Dworkin, et al.[10] implemented this methodology in USA and reported 12% prevalence of TMD cases, similar to the results obtained in our study. Goncalvez [11], used a five-item TMD symptoms questionnaire in a Brazilian urban population, estimating prevalence of TMD as 25%,

and Bevilaqua [12] reported an estimate of 59% in a convenience sample of dental students in Brazil.
The prevalence of TMD seems to be consistently higher among females [11,13]. However, in our study, this pattern was not maintained across the geographic regions, since males presented higher prevalence in Abancay, Pucallpa and Tarapoto, even though more female students had enrolled. In contrast, in Huancayo and Moyobamba we found no occurrence of TMD pain in males, which may represent a cultural difference.

In conclusion, although two versions of the questionnaire are presented by the screener developers, and in the understanding that the short version may be more efficient for field assessment, we would like to recommend the longer 6-items version because it provides the most conservative and consistent estimates of pain-related TMD prevalence. To the best of our knowledge, our study is the first one to implement the validated instrument for field assessment, since no other publications were found in Index Medicus / Medline journals.

FUNDING
None

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