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A POPULATION-BASED STUDY ABOUT THE PREVALENCE OF OROFACIAL PAIN AND ITS ASSOCIATION TO DEMOGRAPHICAL FACTORS IN WEST JAVA PROVINCE - INDONESIA

Tantry Maulina[1], DDS, M.Kes, PhD, Gilang Yubiliana[2], DDS, M.Kes, Cut Novianty Rachmi[3], MD., MIPH, Daisy Wulansari[1], DDS, and Rasmi Rikmasari[4], DDS, SpProst, PhD

[1]Oral Surgery and Maxillofacial Department, Faculty of Dentistry, Universitas Padjadjaran, Indonesia
[2]Dental Health Department, Faculty of Dentistry, Universitas Padjadjaran, Indonesia
[3]Paediatric and Child Health Department, Westmead Children's Hospital, University of Sydney
[4]Prosthodontic Department, Faculty of Dentistry, Universitas Padjadjaran, Indonesia

ABSTRACT

Purpose: The management of orofacial pain in Indonesia has not been well executed due to the lack of epidemiological study that reports its prevalence as well as its related aspects. Therefore, a study that reveal the prevalence and its association to several demographical factors was conducted.

Method: This population-based cross-sectional study was conducted in the area of West Java province, Indonesia. Through a random selection, 1551 participants (582 males; 969 females) from six regencies and three cities in the West Java province were recruited. The participants were interviewed by using a questionnaire that is composed of 15 multiple choices questions about the symptoms of orofacial pain they had or have been experiencing for the last six months and five demographical questions. All answer were recorded and analyzed by using SPSS 22.

Results: Out of 1551 participants, 774 (49.9%) participants experienced various symptoms of Orofacial Pain (OP) for the last six months. From 774 participants, 542 (69.9%) participants claimed to experience two or more symptoms of orofacial pain, 523 (67.5%) participants experienced toothache alone or more symptoms of OP whilst 342 (44.1%) participants experienced TMJ pain alone or more symptoms of OP. There were several significant correlations found between age and pain during mouth opening ($p = 0.03$), gender and TMJ pain ($p = 0.01$), monthly income and TMJ pain ($p = 0.02$), as well as duration of pain and interfered daily activities ($p = 0.00$).

Clinical Significance: The current study provides a high, population-based prevalence of orofacial pain, which is the first one in Indonesia. The results of the current study will be used as the scientific based for the management of orofacial pain in the West Java Province, Indonesia. Therefore, the findings of the current study is significantly important for the Health Division of the local Government in planning the most effective orofacial pain management plan for the upcoming Oral Health Prevention and Curative Program in the upcoming years(s).

INTRODUCTION

The term orofacial pain can be defined as the form of pain that frequently occurs in the oral cavity and/or the facial area that can be caused by diseases or disorders of the regional structures [1]. Despite of the certain effect that all types of pain may have on individuals, the orofacial pain has an "additional" effect on the individual considering that 45% of the human sensory cortex is dedicated to the face, mouth, and oral structure. For example, chronic pain in the orofacial area that limits one's ability to chew will be perceived as a thread to one's existence. And therefore, triggers an instinctive survival response [2].

A recent study of orofacial pain epidemiology in India that involved 2200 patients who came to the University Hospital revealed that out of the 2200 patients evaluated, 43% (946) patients claimed to experience orofacial pain due to toothache whilst 32% (704) patients had it because of periodontal pain. The study also indicated a higher prevalence of orofacial pain in the female group compared to the male group [3]. Another recent study that used a population-based method conducted in Brazil on 505 adults and 385 elders showed that 55.5% of the sample had orofacial pain. It was also revealed that 48.6% of the adult samples complained of an impairment on daily activities, and that orofacial was more likely to happen to women ($p < 0.001$) than to men [4].

The impact of orofacial pain, especially chronic orofacial pain on daily, work, and/or social activities has been extensively studied for the last couple of years. A recent investigation by Cioffi et al. (2014) about the social impairment experienced by chronic orofacial pain patients showed that a group of patients that experienced migraine and a group of patients that experienced both migraine and myofascial pain showed moderate limited impairment [5]. This particular result is inline with previous research that associated chronic orofacial pain with social impairment, reduced quality of life, psychological distress, and physical disability [6]. An impaired quality of life due to chronic orofacial pain with TMD pain in particular was also revealed in previous researches [7-10].

A recent study by Oberoi et al (2014) that involved 500 patients andwas investigating about the prevalence of orofacial pain and their overall impact on the quality of life of the patients showed a 56% prevalence of orofacial pain due to toothache. An investigation about disabilities and limitations experienced by these patients revealed that 26.8% of the participants claimed to have a grade 2 chronic pain score (high disability, moderately limiting) whilst 34.8% participants claimed to have a grade 3 chronic pain score (low disability, high intensity) [11].

Despite of the findings of previous researches all around the globes that highlighted the detrimental effect of orofacial pain, a population-based cross-sectional study that investigated the prevalence of orofacial pain as well as its relationship with several demographical factors such as age, economical status, occupation, gender, and educational attainment has never

been performed in Indonesia. In order to have a more extensive comprehension of the epidemiology and its relationship to demographic factors, a study that was conducted in one of the most occupied province in Indonesia, was designed.

MATERIAL AND METHODS

The current study was conducted in the West Java Province (that has the size of 37.173.93 km^2), Indonesia, after ethical clearance was gained. Six regencies and three cities from all over the province were selected by using the Cluster Sampling method. Participants were then randomly selected by using the Simple Random Sampling (SRS) method. Although the sample size calculation showed a requirement of 1550 participants, ultimately, 1551 participants were recruited in this study.

All participants were interviewed by using an Indonesian version questionnaire that has been used in a preliminary survey and has been validated prior to the start of the study [12], and consists of two parts. The first part of the questionnaire consists of five demographical questions of age, gender, occupation, monthly salary, and educational attainment. The next part of the questionnaire is about the symptoms of orofacial pain that has been experienced for the last six months that consists of the duration of the pain experienced, the type pain experienced by the participants, the quality of the pain, the type of interfered activities due to the pain, as well as the type of Temporomandibular Disorders (TMD) symptoms that occurred due to the pain.

As for the demographical criteria, age of the participants was categorized into three categories, which are 18-27 years old, 28-36 years old, 36-45 years old. Gender was classified as female and male, whilst monthly salary was categorized into six categories, which are: < 1 million rupiah, 1-2.99 million rupiah, 2–2.99 million rupiah, 3–3.99 million rupiah, 4-4.99 million rupiah, and ≥5 million rupiah. There was eight classifications in occupation that includes homemaker, entrepreneur, government employee, labor, private employee, other, unemployed, and student; while educational attainment was categorized into five categories, elementary school, junior high school, senior high school, and college/university, and diploma.

The first question of the orofacial pain symptoms is about the type of orofacial pain experienced by the participants. The next question is about the duration of the pain as well as the frequency of the pain. In the next question, the participant were asked to describe the characteristic of the pain followed by the intensity of the pain at the very moment as well as the intensity of the pain when it was at its worst. The participant was then asked about the type of physical activities that was impaired due to the orofacial pain experienced. Questions about an impaired daily, work, and social functions due to orofacial pain were asked afterwards. The last few questions were about another joint pain that might accompany the orofacial pain for the last six months, whether the participant looked for treatment or not, and the type of TMD symptoms that might be experienced by participants for the last six months that includes clicking, clenching, bruxism, and jaw stiffness in the morning. The English version of the questionnaire can be viewed in Appendix 1.

All data were then gathered and analyzed for frequencies, significant correlations, Odds Ratio (OR) and Relative Risk (RR) by using a Crosstabs analysis from SPSS 22. Significant

correlations were tested by a Chi-square test. Parts of the result that highlighted the findings of the current study is displayed in the result section.

RESULTS

This population based-cross sectional study analyzed the data gathered from 1551 participants. The data includes the demographical characteristics of the participants that consist of age, monthly income, educational attainment, gender, and occupation. The demographical characteristics of the participants illustrated in details in Table 1.

Table 1. Demographical Factor Distribution

Variable	Categories							
Age	18 – 27 years old			28 – 36 years old			37 – 45 years old	
	521			554			476	
Gender	Male				Female			
	595				956			
Monthly Income*	< 1 Million IDR	1-1.99 Million IDR		2-2.99 Million IDR	3-3.99 Million IDR		4-4.99 Million IDR	≥5 Million IDR
	559	667		225	46		22	32
Education	Elementary	Junior High		Senior High	University		Diploma	
	481	474		534	42		20	
Occupation	1**	2**	3**	4**	5**	6**	7**	8**
	718	231	249	190	11	99	5	48

* 1 IDR = 0.0000734 USD.

** 1 = homemaker, 2 = entrepreneur, 3 =g overnment employee, 4 = labor, 5 = private employee, 6 = other, 7 = unemployed, and 8 = student.

Out of 1551 participants, 775 (49.97%) participants claimed that they had experienceed or have been experiencing orofacial pain for the last six months. From the 775 participants, 542 (69.9%) participants experienced two or more symptoms for the last six months, 523 (67.5%) participants experienced toothache alone as well as another type of orofacial pain symptoms, 346 (44.6%) participants complaint of having pain while chewing as well as another type of orofacial pain symptoms, 342 (44.1%) experienced TMJ accompanied by another type of orofacial pain, 187 (24.1%) participants experience pain around the temple together with another type of orofacial pain. The types of pain experienced by the participant are displayed in Figure 1.

Along with this high prevalence of orofacial pain symptoms in Indonesia, several significant correlations between orofacial pain symptoms and demographical factors were revealed. There was significant correlation found between age and pain during mouth opening ($p = 0.03$), gender and TMJ pain ($p = 0.01$), gender and temple pain ($p = 0.00$, OR = 1,8, RR=1,7 with CI 95% (1,25 – 2,31) where men have 1.8 times the odds of experiencing temple pain compared to women), monthly income and TMJ pain ($p = 0.02$), and occupation with the difficulty in speaking due to the pain experienced ($p = 0.03$). Another Significant correlations such as the correlation between the duration of the chronic orofacial pain

symptoms experienced and interfered daily activities ($p < 0.01$), interfered social activity ($p < 0.01$), and interfered work activities ($p < 0.01$) were found and illustrated further more in Table 2.

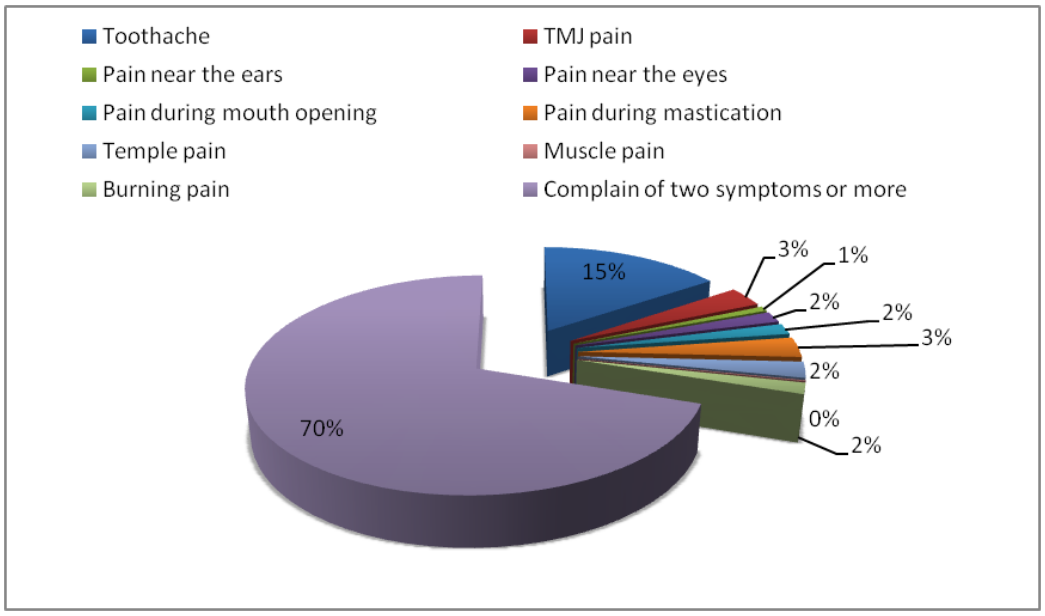

Figure 1. The distribution of Orofacial Pain symptoms amongst participants.

Table 2. Significant correlations between orofacial pain and interference on activities

Variables	Interference on Daily Activities	Interference on Social Activities	Interference on work Activities
Duration of chronic pain	$p < 0.01$	$p < 0.01$	$p < 0.01$
Types of pain felt	$p < 0.01$	$p < 0.01$	$p < 0.01$
Quality of pain	$p < 0.01$	$p < 0.01$	$p < 0.01$

*Significant correlations were tested by using the Chi-square test with $p < 0.05$.

Duration of the pain in the current research was categorized into 0-6 months, 6 months-1 year, 1-2 years, and more than 2 years. The type of pain was categorized into: (1) pain of the TMJ or an area in front of or inside the ears; (2) a blunt pain around the face or neck; (3) burning sensation on the tongue or any other oral mucous; (4) electricity like pain on the face; and (5) toothache, whilst the quality of pain was divided into mild, moderate, and severe.

In line with results from previous studies that revealed the significant correlation(s) between education to orofacial pain symptoms [13, 14] or TMD symptoms, there was a significant correlation found between education and grinding or clenching the teeth during night time ($p = 0.01$). It was also revealed that men have the risk of 2,25 more than women to grind or clench during night time (OR = 2.5, RR = 2,25 CI 95% (1.73 – 2.92). Another

significant correlations found between socioeconomic indicators and the symptoms of TMD are displayed in Table 3.

Table 3. Significant Correlations Between Socioeconomic Indicators (Age, Gender, Income, educational attainment, and Occupation) to TMD Symptoms

	Age	Gender	Income	Educational Attainment	Occupation
Grating or grinding	NS*	p = 0.01	NS	NS	NS
Jaw pain whilst chewing	NS	NS	NS	NS	p < 0.01
Grinding or clenching during night time	NS	p < 0.01	p=0.03	p=0.01	p < 0.01
Grinding or clenching during daytime	NS	p = 0.03 OR = 1.65 RR = 1.61 CI 95% (1.04-2.5)	p=0.01	NS	p < 0.01
Difficulty in opening the mouth	p = 0.01	p = 0.05	NS	NS	NS

Significant correlations were tested by using the Chi-square test with $p < 0.05$.

DISCUSSION

The finding of the current study suggested that there was a high prevalence of orofacial pain in the Indonesian sample. A similar finding was revealed from the study performed amongst 1032 Korean elderly that showed a high prevalence on orofacial pain symptoms such as toothache (26.8%) and oral sores (26.2%) (15), and a study amongst Brazilian samples that revealed a prevalence of 55.5% of head and facial pain [4].

In another population based study conducted in the UK on 2504 adults aged between 18-65 years old, 473 (23%) participants reported the orofacial pain that they have been experiencing (16). Another study that was performed in Hong Kong, Chinese, on 1222 Cantonese-speaking adults aged at least 18 years of age showed a percentage of 41.6% when the study includes pain as the symptoms of tooth sensitivity [17].

There was a significant correlation found betweenn monthly income and pain in the Temporomandibular Joint (TMJ) in this study (p = 0.02). This particular finding is similar to a study conducted by Bastos et al. on a population (n = 3353, response rate 93.5%) in Southern Brazil that showed toothache is more likely to be reported by those who have low family income and educational attainment [18].

Another significant correlation found in this study was between gender and TMJ pain. This finding is in line with the previous study conducted by Bagis et al. on 243 patients with TMD symptoms. The result of the study showed that females are more likely to have TMJ pain compared to man (19). A similar finding were revealed by a study performed by Sanders and Slade (2011) on Data taken from the National Survey of Adult Oral Health conducted in Australia from 2006-2006 that were collected from 3954 adults aged 18-91 years that showed higher prevalence of pain in females compared to males [20]. The same result was also showed by the several previous studies [21-23].

A significant correlation between age and chronic orofacial pain was found in the study of Boggero et al. (2015). The study collected data from the records of 508 chronic orofacial pain patients (aged 18-78 years). A significant interaction found showed that aging was associated with reduced interference at high levels of pain intensity [24]. Similar result that showed the correlation between age and orofacial pain symptoms was also revealed by previous studies [25, 26].

Another important findings of the current study is the significant correlation found between the duration of the orofacial pain, the types of orofacial pain, and the quality of the pain and interfered daily, social, and work activities. The interfered activities due to orofacial pain symptoms are one of many indicators of impaired quality of life of the patients. This finding is inline with previous studies [10, 11, 27-] that showed how orofacial pain managed to reduce or impair the quality of life of the patient.

CONCLUSION

There was a high prevalence as well as several statistically significant correlations found between the symptoms of orofacial pain and the demographical factors in Indonesia that indicated the need of an adequate, immediate, and comprehensive management of orofacial pain cases in Indonesia. Considering the detrimental impact of orofacial pain, it is considered to be of importance to minimize the high prevalence of orofacial pain experienced by the Indonesian patient sample in the near future. The result of the current study should be considered by the Indonesian government to be used as one of the scientific background when the government is mapping the oral health program in the coming future.

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APPENDIX 1. THE ENGLISH VERSION QUESTIONNAIRE

QUESTIONNAIRE

Name:
City/Regency
District:

1. Your gender is:
   - ✓ Male b. Female
2. What age group do you belong to:
   - ✓ 18-27 yo b. 28-36 yo c. 37-45 yo
3. Highest educational attainment:

- ✓ Primary School b. Junior High c. Senior High d. University e. Diploma

4. Your monthly income:
   - ✓ < 1.000.000 IDR
   - ✓ 1.999.999 IDR
   - ✓ 2.000.000 – 2.999.999 IDR
   - ✓ 3.000.000 – 3.999.999 IDR
   - ✓ 4.000.000 – 4.999.999 IDR
   - ✓ 5.000.000 IDR
5. Your occupation:
   - ✓ Homemaker
   - ✓ Entrepreneur
   - ✓ Government employee
   - ✓ Labor
   - ✓ Private employee
   - ✓ Others
   - ✓ Unemployed
   - ✓ Student
6. Have you had the following symptoms during the past 6 months?
   - ✓ Toothache
   - ✓ Pain in the jaw joint/s
   - ✓ Pain in area just in front of the ear/s
   - ✓ Pain in or around the eyes
   - ✓ Pain when opening the mouth wide
   - ✓ Shooting pains in the face or cheeks
   - ✓ Pain in the jaw joint when chewing food
   - ✓ Pain in and around the temples
   - ✓ Tenderness of muscles at the side of the face
   - ✓ A prolonged burning sensation in the tongue or other parts of the mouth

IF NO, GO TO QUESTION 19

7. How long have you had this pain?
   - ✓ 0-6 months b. 6 months – 1 year c. 1-2 years d. More than 2 years
8. Which one of these four options best describes your pain:
   - ✓ present all the time you are awake
   - ✓ coming and going, lasting seconds to minutes
   - ✓ coming and going, lasting more than an hour
   - ✓ occurring once only
9. I am going to read out several ways to describe pain. Could you tell me with a yes or no, if they describe what your pain feels like.
   - ✓ pain in the jaw joint, in front of the ear or inside the ear (other than infection in the ear)
   - ✓ a dull, aching pain across your face or cheek that has occurred more than once
   - ✓ a prolonged, unexplained pricking or burning sensation in your tongue or any other part of your mouth that has occurred more than once
   - ✓ a burst of electric shock-like pain in your face

- ✓ pain in one or more of your teeth

10. How intense is your pain right now?
    - ✓ No pain presently
    - ✓ Mild pain
    - ✓ Moderate pain
    - ✓ Severe pain
11. How intense has your pain been in the past six months?
    - ✓ Mild pain
    - ✓ Moderate pain
    - ✓ Severe pain
12. How intense was your pain when your pain was at its worst?
    - ✓ Mild pain
    - ✓ Moderate pain
    - ✓ Severe pain
13. From these list of activities, can you tell me with a "yes" or "no" if your pain prevents or limits you from doing any of these?
    - ✓ Chewing
    - ✓ Drinking
    - ✓ Exercising
    - ✓ Eating hard foods
    - ✓ Eating soft foods
    - ✓ Smiling/laughing
    - ✓ Swallowing
    - ✓ Cleaning teeth or face
    - ✓ Yawning
    - ✓ Kissing
    - ✓ Talking
    - ✓ Having a good night's sleep
14. In the past six months, has your pain interfered with your daily activities?
    - ✓ Yes
    - ✓ No

    If yes, is it:
    - ✓ A little bit
    - ✓ Quite a bit
    - ✓ A moderate amount
    - ✓ An extreme amount
    - ✓ Do not know
15. In the past six months, how much has your pain interfered with your ability to take part in recreational, social and family activities?
    - ✓ Yes
    - ✓ No

    If yes, is it:
    - ✓ A little bit
    - ✓ Quite a bit
    - ✓ A moderate amount
    - ✓ An extreme amount

- ✓ Do not know

16. In the past six months, how much has your pain interfered with your ability to work (including housework)?
    - ✓ Yes
    - ✓ No

    If yes, is it:
    - ✓ A little bit
    - ✓ Quite a bit
    - ✓ A moderate amount
    - ✓ An extreme amount
    - ✓ Do not know
17. Do you have or have you had in the past any swollen or painful joints in parts of your body other than your jaw?
18. IF YES, is this a persistent problem that you have had for at least 6 months?
19. Have you ever been to a physician, a dentist or other health professional for facial ache, pain or discomfort?
20. IF YES, was this more than 6 months ago?
21. On average how many health care visits have you ever made for your face pain?
22. In the last 6 months can you tell me with a yes or no if
    - ✓ your jaw clicks or pops when you open or close your mouth or when chewing?
    - ✓ if your jaw make a grating or grinding noise when it opens and closes or when you chew?
    - ✓ if your jaw aches or feels stiff when you wake up in the morning?
    - ✓ if your jaw hurts when you chew or shortly after eating?
    - ✓ if you have been told, or do you know that you grind your teeth or clench your jaw while sleeping at nights?
    - ✓ if during the day you grind your teeth or clench your jaw?
    - ✓ if the way your teeth come together feels uncomfortable or unusual?
    - ✓ if opening your jaw is difficult enough to interfere with your ability to eat?

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