

Prevalence of Temporomandibular Joint Clicking in Adolescents, Adults, and Elderly Patients

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Abstract

The process of aging increases the degeneration of the body system. This degeneration also occurs in the temporomandibular joint. This study was conducted to examine the prevalence of temporomandibular joint clicking in adolescents, adults, and elderly patients in Universitas Muhammadiyah Yogyakarta, Indonesia (UMY) Dental Hospital.

This descriptive observational study was conducted using a cross-sectional approach. A total of 250 patients from UMY Dental Hospital, consisting of 207 adolescents (82.8%), 36 adults (14.4%), and 7 elderly subjects (2.8%), were enrolled in this study. Palpation and auscultation were used to examine the temporomandibular joint clicking sound. Of the 250 study patients, 124 (49.6%) had temporomandibular joint clicking, including 98 adolescents, 22 adults, and 4 elderly subjects.

The prevalence of temporomandibular joint clicking was 49.6%, and adult patients had the highest prevalence.

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Introduction

Temporomandibular joint disorders (TMDs) constitute several clinical problems in masticatory muscles, temporomandibular joints, and other related structures.¹ There are two categories of TMDs, masticatory muscle disorders and joint disorders. The symptoms of TMDs include muscle pain, joint sounds, limitation of mouth opening, and changes in mandibular movement.²

The most common symptom of TMDs is joint sounds^{3,4}, which are of two types, clicking and crepitus. Clicking is a short period of joint sound. It occurs while opening and closing the mouth. Patients who experience clicking generally do not feel pain.

In contrast, crepitus is often found in patients with osteoarthritis and generally accompanied by pain.¹ The clicking sound while opening and closing the mouth is the earliest symptom of this TMDs.⁵

Various studies from several countries have investigated the prevalence of TMDs

involving numerous types of populations and ages using a variety of research methods. The prevalence of TMDs in each country was found to be different from one another. Studies conducted on adolescent populations have reported the prevalence of TMDs as 46.1% in Mexico, 68.6% in Jordan, 77.8% in Sudan, and 15% in India.⁶⁻⁹ Regarding the adult population, the prevalence rates of TMDs have been reported as 61.3% in Korea, 33.3% in China, and 10.8% in the United Arab Emirates.¹⁰⁻¹² Furthermore, the prevalence rates of TMDs among the elderly population were reported at 33.1% in Mexico and 68% in Indonesia.^{13,14} These studies show that the prevalence of TMDs varies according to the country. Multiple countries have conducted studies on the incidence of TMDs by involving different age groups.

In Indonesia, only a few studies have been conducted on TMDs till date. To our knowledge, there are still no data regarding the prevalence of TMDs among various age groups, especially regarding the clicking sound of TMDs. Therefore, we conducted this study to determine the incidence of clicking across multiple age groups in Yogyakarta, Indonesia.

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Materials and methods

The research protocol of our study was approved by the Ethics Committee of Universitas Muhammadiyah Yogyakarta, Indonesia (approval number: 593/EP-FKIK-UMY/XII/2018).



Figure 1. Palpation of the temporomandibular joint¹.



Figure 2. Auscultation of the temporomandibular joint¹⁵.

We examined those patients who visited UMY Dental Hospital in January and February in 2019. The inclusion criteria were having the complete set of teeth until the second molar, use of dentures if there were some missing teeth, and not receiving orthodontic care. We found 250 patients who fulfilled these criteria. We categorized them into three research groups, i.e., a group of adolescents (aged 17–25 years), a group of adult patients (aged 26–45 years), and a group of elderly patients (aged 46–55 years). All

patients were asked to provide their informed consent for a clinical examination. Palpation (Figure 1) and auscultation (Figure 2) were used to analyze the temporomandibular joint sound in these patients.^{1,15} This examination was conducted by two operators who had received training. During the investigation, the patients were instructed to perform mandibular movements in the form of opening, closing, retraction, protrusion, and lateral movements. The operator recorded whether there was a clicking sound during this examination.

Results

Among the 250 study subjects, there were 207 adolescents (82.8%), 36 adults (14.4%), and 7 elderly patients (2.8%). Table 1 shows the characteristics of the study subjects. The majority of the adolescents and elderly subjects were females. As most of the subjects were adolescents, more than half were consequently females. Figure 3 shows the prevalence of temporomandibular joint clicking according to the age group. The prevalence of clicking was 49.6%. Based on the age group, the prevalence of clicking was 47.3% in the adolescent-aged group, 61.1% in the adult-aged group, and 57.1% in the elderly aged group.

Sex	Age Group			Total
	Adolescent	Adult	Elderly	
Male	64	18	1	83
Female	143	18	6	167
Total	207 (82.8%)	36 (14.4%)	7 (2.8%)	250 (100%)

Table 1. Characteristics of Study Subjects.

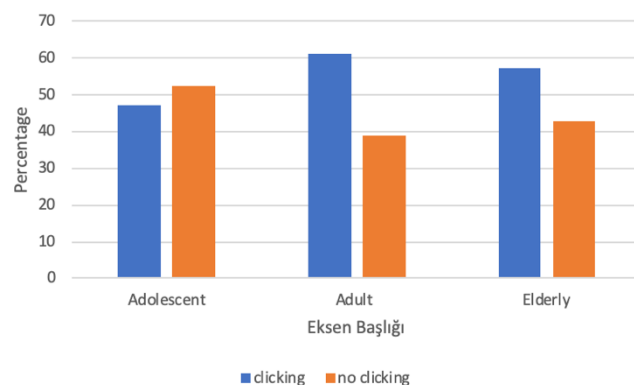


Figure 3. Prevalence of clicking according to the age group.

Discussion

To our knowledge, this is the first study to examine the prevalence of temporomandibular joint clicking in the Indonesian population of various age groups. We found that clicking occurred in all age groups. A total of 124 patients (49.6%) experienced joint sounds such as clicking in this study. This finding is consistent with a study conducted by Dworkin et al., who reported a 50% prevalence of clicking in the general population aged between 18 and 75 years.¹⁶ However, other studies have reported different results. For instance, a study conducted on 616 healthy Chinese male pilots aged 23–52 years reported a prevalence of clicking of only 18.8%.¹¹ In another study conducted in Maringa city (Brazil), the prevalence of clicking in 1643 patients aged 20–65 years was 21%.¹⁷ This difference could be due to the sample size and sample characteristics.¹¹

In the present study, adolescents were the highest in number [207 patients (82.8%)] compared with adults [36 patients (14.4%)] and elderly subjects [7 patients (2.8%)]. According to Tallents et al., the prevalence of tooth loss increases as people age.¹⁸ In this study, we found that the majority of adult and elderly patients who visited UMY Dental Hospital had lost their teeth. They did not use dentures, and hence did not meet the research criteria.

Clicking occurs because of an abnormal relationship between the components of the temporomandibular joint, which includes the condyles, discus articularis, and pterygoid muscles. When the joint is damaged or receives an excessive load, the pterygoid muscles experience an increase in tonicity. This condition results in the discus getting pulled toward the front so that the posterior part of the discus gets thickened. When opening the mouth, the condyles move forward and pass through the posterior part of the discus. When the head of the condyle rubs against the posterior portion of the thickened discus, there is a release of energy in the form of a “click sound”.^{1,19} Placing a finger or a stethoscope on the lateral surface of the joint can determine the click sound. During the examination, the operator instructed the patient to open and close the mouth.¹

In this study, the prevalence of clicking among adolescent subjects was 47.3%. This value was not much different from that reported

by Ryalat et al., who mentioned a prevalence of 42.5% among the students of the University of Jordan aged 18–25 years.⁷ The symptoms of TMDs that emerge in adolescents are suspected to be the impact of hormonal changes and the puberty process.²⁰ The joint sound in adolescents is affected by biological factors such as bad habits and adaptation during the growth progress.²¹ According to Khan et al., the prevalence of joint sound among adolescent patients is quite low. The joint sound in adolescents does not indicate any disease involving the joint; thus, treatment is not necessary.²²

The prevalence of clicking in adult patients was 61.1%, which was consistent with a study conducted by Talaat et al. on 325 patients aged 25–45 years, wherein the prevalence of joint clicking sound was 68.92%.¹² Joint sounds such as clicking and popping occur more in adults than in adolescents with a frequency of up to 1.6 times higher.¹⁰ This phenomenon is suspected to be related to psychological stress, which is commonly experienced during adulthood and productive age.²³

In this study, the prevalence of clicking among elderly patients was 57.1%. Similarly, a quite high prevalence was also reported by Sampaio.²⁴ Some researchers are convinced that disc replacement is a natural physiological process that occurs as people age, so that joint sound is considered as a normal variation in older people.² However, another study conducted by Herdiyani et al. reported that older adults also have the same risk of experiencing TMD.²⁵

In the present study, as more adolescents than adults and elderly subjects volunteered for participation, the unequal proportion between the age groups may be considered as a limitation. Another limitation is that we did not consider the possible etiological factors of TMD in each subject. For further research, we suggest examining a broader population with a variety of etiological factors associated with TMDs.

Conclusions

The prevalence of temporomandibular joint clicking as a symptom of TMDs was high among the patients attending UMY Dental Hospital. Clicking was observed in all age groups from 17 to 55 years.

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Declaration of Interest

The authors report no conflict of interest.

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