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The Prevalence of Temporomandibular Joint Disorders in Young Violin Players in Two Orchestras in Indonesia

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ABSTRACT

This study aimed to provide information about the prevalence of temporomandibular disorders (TMD) in young violin orchestra players as an illustration of TMD events in violinists in Indonesia. The subjects were 68 violin players of OSUI Mahawaditra and MYSO orchestra. The data gathered through an interview and some questionnaires. The TMD clinical examination included the palpation of head and neck muscles and the measurement of mouth opening. The caliper used for mouth opening height, while two fingers used for muscle palpation. Based on Fonseca's analysis, the prevalence of TMD revealed in young violinists is 90%, while the prevalence of TMD based on DC-TMD form is 80%. This study concluded that there is a high prevalence of TMD in young violinists from several orchestras in Indonesia, with the values that more than 50%.

¹⁰ **Keywords:** Fonseca, Prevalence, Temporomandibular disorders, Violin players.

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INTRODUCTION

Temporomandibular joint (TMJ) disorder is a condition that is often experienced by some people with specific occupations. Some of these jobs included wind instrument players, string instrument players, employees who worked behind computers, divers, and also the dentists.^{1,2} String instrument players can spend hours practicing the violin. This condition makes them have to be in the position of clamping the instrument with their chin and shoulder. It will produce a chin pressure on the chin rest that can affect the TMJ.¹ A prevalence study in Italy reported that almost 75% of the population complained of at least one sign of joint dysfunction.³ This shows that TMD is a chronic orofacial pain problem that is most common in dentistry.

TMD is a very controversial discussion in the world of dentistry. The etiology of this disorder has been debated in recent years. TMD can be caused by various factors, including trauma, psychological conditions, and patient occlusion patterns.⁴ The etiology of TMD is very wide, so different classifications appear along with the cases that trigger it. Some literature classifies it as acute and chronic, with etiology in the form of trauma, occlusal patterns, bad habits, psychological, hormonal, and hereditary factors.⁵ Okeson classifies TMD's etiology into five elements, such as occlusal conditions, trauma, stress, deep pain, and parafunctional habit.⁶ In acute conditions, significant injury resulting from an accident can result in fractures or displace bones and joints in the jaw and result in TMD. Other severe conditions are at the opening of the mouth for a long time, such as in a dental procedure, or opening the mouth that is too wide when yawning or laughing. All of these conditions fall into the category of a minor trauma.^{7,8}

The condition of chronic pain caused by TMD leads to psychological and psychosocial disorders that can affect a person's quality of life. Patients with TMD will experience physical disturbances and limitations that can result in physical activity, which leads to a decrease in quality of life.⁹ Several studies abroad have been conducted and revealed the prevalence rates of TMD in violin players. This study aimed to provide information about the prevalence of TMD in young violin orchestra players as an illustration of TMD events in violinists in Indonesia.

MATERIAL AND METHOD

The subjects were 68 violin players of two group's orchestra (OSUI and MYSO) in Indonesia. The study used primary data, which was gathered through an interview and filled out some questionnaires. The questionnaires used were Fonseca and a questionnaire made by the researcher. Fonseca Questionnaire consists of several questions as follows:

The TMD clinical examination was carried out afterward. It included the palpation of head and neck muscles, and also the measurement of mouth opening. The investigation was conducted based on the instruction of the TMD examination protocol of International Network for Orofacial Pain and Related Disorders Methodology (INFORM), the Diagnostic Criteria for TMD 2017 (DC-TMD 2017). The caliper used for mouth opening measurement, while two fingers used for muscle palpation.

RESULTS

Sixty-eight subjects completed the questionnaires, they were 49 women, and 19 men ranged from 18 to 50-year-old. Most subjects experienced pain in the head and neck muscles. Fifty-two subjects (76.47%) had experience with head and neck muscle pain since playing the violin for the first time. The other 16 subjects (23.53%) claimed to have never experienced pain in the head and neck muscles. The experience of pain then raises questions about when the subjects' emergence of pain felt. The time of the occurrence of pain is divided into several classifications, during exercise, after exercise, and in both. The pain was felt after exercise by as many as 38% of subjects, during and after use by 34%, and during exercise by 28% of subjects. The subjects were also asked about the area of pain felt. Most subjects experienced pain in the neck, chin, and shoulder area, with almost the same percentage. The area of pain that is most often felt in neck (29.55%), followed by chin (28.41%) and shoulders (27.27%). Another small percentage of pain was felt in the back, upper arms, cheeks, waist, ears, and fingers.

As shown in Table 2, the DC-TMD examination performed in violin subjects shows the most disorder was disc displacement with reduction and followed by myalgia.

In clinical examination, it is known that the subjects dominantly felt several areas of pain during palpation. TMJ pain was felt by 60% of subjects, with 50% being a pain in the right TMJ. Thirty-five percent of subjects felt pain during palpation of the masseter muscle. Pain in palpation of the right masseter muscle was felt by 25% of subjects while in the left masseter muscle was felt by 75% of subjects. Pain during palpation of the temporal muscle is felt by 60% of subjects. Forty percent of subjects felt pain when palpating the right temporal muscle, while 60% of subjects felt pain when palpating the left temporal muscle. Clicking is experienced by 20% of subjects. Three subjects (75%) were experiencing clicking on the left TMJ and other subjects experiencing clicking on both sides of the TMJ. Based on the Fonseca questionnaire, the severe TMD was experienced by 5% of subjects, and the moderate category was experienced by 45% of subjects. The category of mild TMD was experienced by 40% of subjects, while NO TMD was experienced by 10% of all subjects. Based on the pain drawing of DC-TMD form, the severe category of TMD was experienced by 35% of subjects. The moderate was experienced by 35%. In comparison, the mild category experienced by 25% and NO TMD experienced by 5% of all subjects.

DISCUSSIONS

The prevalence of TMD in young violinist was assessed based on several analyses, such as Fonseca, DC-TMD, and pain drawing. The Fonseca analysis is an assessment that focuses on the relationship between TMD and the quality of life. The questions posed in the Fonseca questionnaire include various things related to daily activities. The questions aim to provide answers to analyze whether TMD disturbs the subject in carrying out their daily activities.

Fonseca's analysis found that the prevalence of TMD in violinists was more than 50%, 63.28%. This is in line with the research conducted by Rodriguez et al., who also used the Fonseca questionnaire, which stated that the prevalence of TMD in violin players was more than 50%, which was 61%.¹⁰ The study was conducted on violinists with similar exclusion criteria with this research. The exclusion criteria were a violinist undergoing orthodontic treatment and subjects who had experienced head and neck trauma.

On the examination using the DC-TMD form, researchers analyzed the presence of TMD by conducting a clinical investigation and relating it to subjective complaints felt by the subject. The clinical examinations using this analysis include palpation of the head and neck muscles, measurement of the width of the mouth opening, observation linked to existing subjective complaints, then contained in the decision tree form, and a diagnosis is obtained for each subject.

Determination of the diagnosis of TMD in musical instrument players was carried out by Jang Jae-Young et al. who explained that myalgia occurred as much as 83.1%, displacement with reduction disc as much as 74.1%, arthralgia as much as 62%, and disc displacement without reduction as much as 1.4%.¹¹ Subjects in this study also suffered disc displacement with reduction diagnosis. This condition was experienced in 33% of subjects for ten events. The diagnosis of myalgia in the

study conducted by Jang Jae-Young et al. was the highest percentage diagnosis.¹¹

In contrast, there was only one subject (3.3%) diagnosed with myalgia in this study. The diagnosis in that study was also dominated by arthralgia as much as 62%. This was not in line with this study, where the incidence of arthralgia only occurred in 4 subjects (13.3%). Disc displacement without reduction diagnosis in that study occurred in small amounts (1.4%). These results are in line with this study, where the diagnosis of disc displacement without reduction occurs in small numbers, which occurs in 1 subject (3.3%). Clicking is experienced by 20% of subjects, with three subjects (75%) experiencing clicking on the left TMJ while one other is experiencing clicking on both sides of the TMJ. These results are in line with the study of Rodriguez et al., which stated that 51.2% of violin players were subjected to TMJ clicking. (10) Also, a study conducted by Steinmetz et al. also showed that 58% of violinists experienced TMJ.¹²

Violinists generally experience pain in some areas of their body. Pain felt by players typically occurs when and after playing the violin. In this study, the most significant percentage (38%) was pain that was felt after playing the violin. This is different from the research conducted by Steinmetz et al., which stated that 81% of subjects felt pain when doing exercise.¹²

In addition to asking about the experience of pain in the subject according to time, this study also analyzed the involvement of pain through drawing pain form of DC-TMD. In this analysis, the item is given a piece of paper with the anatomy of the body and head-neck, then the question is instructed to mark it by shading the area of

the body on the paper where the subject often feels the pain. The category of NO TMD assessment is stated if the item does not have one area of Pain, mild TMD if there is 1 area of Pain, moderate TMD if there are two areas of pain, and severe TMD if there are more than two areas of pain.¹³

CONCLUSIONS

Based on Fonseca's analysis, the prevalence of TMD revealed in young violinists is 90%, while the prevalence of TMD based on DC-TMD form is 80%. This research concluded that there is a high prevalence of TMD in young violinists from several orchestras in Indonesia, with the values being more than 50%.

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Table 1. Fonseca Questionnaire

1	Questions	Answer		
		No	Sometimes	Yes
	Is it hard for you to open your mouth?			
	Is it hard for you to move your mandible from side to side?			
	Do you get tired/ muscular pain while chewing?			
	Do you have a frequent headache?			
	Do you have pain on the nape or stiff neck?			
	Do you have earaches or pain in craniomandibular joints?			
	Have you noticed any TMJ clicking while chewing or when you open your mouth?			
	Do you clench or grind your teeth?			
	Do you feel your teeth do not articulate well?			
	Do you consider yourself a tense (nervous) person?			

Table 2: Diagnose based on DC-TMD

5	Diagnose	n	%
	Myofascial Pain	2	6.6
	Myofascial pain with referral	2	6.6
	Myalgia	1	3.3
	Local myalgia	6	20
	5 thralgia	4	13.3
	Disc displacement with reduction	10	33
	Disc displacement without modification with limited opening	1	3.3
	No TMD	4	13.3



Figure 1. Head and neck muscle examination. a. Joint palpation; b. Muscle palpation

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