The Relationship Between Temporomandibular Disorders and Quality-of-Life–Related Orofacial Pain

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Abstract

Temporomandibular disorders may have an impact on quality of life. No studies have been done to analyze the relationship between temporomandibular disorders and quality of life in particular by using the Oral Health Impact Profile–Temporomandibular Disorder Indonesia (OHIP-TMD-ID) and the Diagnostic Index for Temporomandibular Disorder (ID-TMD) in Indonesia. The aim of this study is to analyze the relationship between temporomandibular disorders and quality of life, temporomandibular disorders and socio demographic factors (age, gender, education level, and economic level), and quality of life and socio demographic factors (age, gender, education level, and economic level). A cross-sectional study was conducted on 115 subjects, ages 20–40 years, who were patients at the Integration Clinic of Rumah Sakit Gigi Mulut Fakultas Kedokteran Gigi Universitas Indonesia. Subjects' personal data were obtained and interviews for the ID-TMD questionnaire and the OHIP-TMD-ID questionnaire were conducted. The Mann–Whitney test showed significant differences between temporomandibular disorders and quality of life. There were no significant differences between quality of life and socio demographic factors (age, gender, education level, and economic level). The chi-square test also showed no significant differences between temporomandibular disorders and socio demographic factors. Temporomandibular disorder patients suffered from impaired orofacial pain-related quality of life.

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Introduction

Temporomandibular disorders (TMD) is a collective term that involves several clinical problems affecting the masticatory muscles, temporomandibular joint (TMJ), or orofacial structures.[1] The etiology of TMD is multifactorial and very complex, such as due to emotional stress, an occlusal condition, body posture, dysfunction of masticatory muscle or other structures related to TMD, extrinsic and intrinsic changes of temporomandibular joint structures, parafunctional activities, trauma, age, gender, psychosocial factors, or a combination of different factors.[1,2,3] The symptoms of TMD are pain in the TMJ, pain in the periauricular area or mastication muscle, head and neck pain, TMJ clicking, chewing difficulty, jaw deviation, and limited mouth opening.[3,4]

Much research about the signs and symptoms of TMD previously has been done, but the prevalence varies among ages and genders.[5] The prevalence of TMD in children is low, increases in adolescence and early adulthood, and reaches its peak in middle age, and in the elderly group, the prevalence of symptoms of TMD decreases.[5,6] Epidemiological studies have shown that TMD is two times more prevalent in women than in men.[2] However, a different result was obtained by Himawan et al., who found that men were more likely to suffer from TMD and that TMD decreased with age.[7] Some researchers have stated that TMD is more prevalent in the age range of 20–40 years,[2,8] which is included in the productive age group. According to the World Bank, the productive age group in Indonesia is between 15 and 64 years old.[9] In this age group,

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humans are at the peak of their activities, during which productivity in everyday life tends to be high. TMD causes non dental pain in the orofacial area and can affect oral health. This has an impact on quality of life.[4] TMD symptoms include pain in the TMJ, pain in the periauricular area or masticatory muscles, and dysfunction such as chewing difficulty and limited mouth opening, and can have an influence on social behavior, psychological status, high living costs, and limitations of the patient's activities.[10] The more severe pain in the TMD, the greater the impact on quality of life from the aspects of oral health.[11] The World Health Organization (WHO) defines quality of life or the perception of quality of life as an individual in the context of the culture and norms in accordance with the individual's residence and is associated with goals, expectations, standards, and concern for the individual.[12] Quality of life from the aspect of oral health, known as oral health-related quality of life (OHRQoL), is a multidimensional concept that reflects one's comfort when eating, sleeping, social interaction, self-confidence, and satisfaction with their oral health.[12]

In 2006, Himawan et al. developed the Diagnostics Index for Temporomandibular Disorders (ID-TMD). This index aims to obtain a reference that is easy, simple, fast, and accurate for the initial screening tool of the TMD. ID-TMD is not complex and can be used for developing countries like Indonesia.[13] In 2011, Durham introduced the Oral Health Impact Profile for TMDs (OHIP-TMD) as an index that provides a more concise, specific, and sensitive way to measure the quality of life in patients with TMD.[14] OHIP-TMD also has measurements, such as the Oral Health Impact Profile-49 (OHIP-49) and the Oral Health Impact Profile-14 (OHIP-14), to define the following seven dimensions: functional limitations, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap.[14] In Indonesia, the Oral Health Impact Profile–Temporomandibular Disorder Indonesia (OHIP-TMD-ID) index has been validated by Vivi (2016) with Cronbach's alpha values for 0.951, derived from 22 questions OHIP-TMD.[15] Many studies have examined the prevalence of TMD, but few researches have compared the relationship of TMD and quality-of-life–related orofacial pain, especially in Indonesia. For that reason, the authors are interested in doing research on the relationship of TMD and quality of life by using the OHIP-TMD index that has been validated in Indonesia (OHIP-TMD-ID) and ID-TMD. The authors also want to examine the relationship between those two variables and gender, age, economic level of economy, and education level.

Materials & Methods

This study is a cross-sectional analytical study that analyzes the relationship between TMD and quality-of-life–related orofacial pain. In the study, all of the variables were seen and measured only once at the time of inspection. The independent variable in this study is the TMD. The dependent variable is the quality of life. Confounding variables to consider are socio demographic factors (gender, age, economic level, and education level).

The study was conducted in the dental teaching hospital, Faculty of Dentistry, Universitas Indonesia. The inclusion criterion to be a subject of the research was 20–40 years old, not being considered for treatment of TMD, and not in orthodontics treatment.

All subjects gave informed consent for procedures approved by the proper Ethics Committee of the Faculty of Dentistry Universitas Indonesia. Subjects who were not willing to complete the approval letter were excluded as a subject. A total of 115 subjects were chosen by consecutive sampling (non probability sampling).

In this study, researchers took the data directly from the subject. The subject fulfilled the inclusion criteria after signing the informed consent of the biodata recorded. After that, researchers interviewed the subject by filling out the ID-TMD and the Oral Health Impact Profile for TMDS Indonesia (OHIP-TMD-ID) questionnaire. Then, the collected data were analyzed using SPSS software.

Univariate data analysis was conducted to determine the frequency distribution and the percentage of each variable on the subject. Then, a bivariate analysis using a comparative analysis was performed to test the numeric variable, and an unpaired Kruskal–Wallis test and a Mann–Whitney test were performed to examine the association between temporo-mandibular disorder and quality of life related

orofacial pain. Also, test was performed to examine the association between quality of life related orofacial pain and socio demographic factors (age, gender, economy level, education level).

In addition, a comparative analysis test and an unpaired categorical variables chi-square test were performed to determine the relationships between temporomandibular disorder and socio demographic factors (age, gender, economy level, education level).

Results

Subjects' ages ranged from 20–40 years, with 72.2% of the subjects falling in the 20–30-year range and 27.8% falling in the 31–40-year range. Out of 115 subjects, 65 subjects were female (56.5%). Varying levels of education were divided into low (no school, elementary school, or junior high school) and high (high school, bachelors, or diploma). The percentage of subjects with a high education level was 92.2% (106 people). Varying economic levels were divided into no income, 0 up to Rp.3,100,000 and more than Rp.3,100,000.

Table 1. Correlation Between Quality of Life and Temporomandibular Disorder, Sociodemographic Factors (Age, Gender, Education Level, Economic Level)

Variable	n 115	Quality of Life Median (Min–Max)	P-Value
TMD			0.000[a]*
Non-TMD	56	9 (0–37)	
TMD	59	32 (0–63)	
Age (years)			0.087[a]
20–30	83	18 (0–61)	
31–40	32	24.5 (0–63)	
Gender			0.355[a]
Male	50	17 (0–63)	
Female	65	21 (0–61)	
Education Level			0.692[a]
Low	9	15 (1–49)	
High	106	21 (0–63)	
Economic Level (Rupiah)			0.462[b]
No income	45	21(0–54)	
0–3,100,000	26	25.5(4–63)	
> 3,100,000	44	17(0–61)	

[a]Analysis using Mann–Whitney test
[b]Analysis using Kruskal–Wallistest
*Variables with significant association(p < 0.05)

This was based on the UMR (Upah Minimum Regional) 2016 DKI (Daerah Khusus Ibukota) Jakarta.[16] Seventy-one subjects (61.7%) fell into the low economic level (no income and below average). The number of subjects with TMDs was 59, or 51.3%. As shown in Table 1, TMD and quality of life have a significant correlation (p< 0.05). The quality of life has no significant correlation (p > 0.05) with socio demographic factors, such as age, gender, education level, and economic level. As shown in Table 2, TMD has no significant correlation with socio demographic factors, such age, gender, education level, and economic level.

Table 2. Correlation Between Temporomandibular Disorder and Sociodemographic Factors (Age, Gender, Education Level, Economic Level)

Sociodemographic Factors	TMD		p-Value
	Non-TMD	TMD	
Age (years)			0.808
20–30	41	42	
31–40	15	17	
Gender			0.534
Male	26	24	
Female	30	35	
Education Level			0.261
Low	6	3	
High	50	56	
Economic Level(Rupiah)			0.492
No income	23	22	
0–3,100,000	10	16	
> 3,100,000	23	21	

Analysis using chi-square test

Discussion

In this study, the selected age range was 20–40 years, the age group most commonly affected by TMD. Helkimo reports, as cited in Cordeiro et al., that TMD prevails in the age group 35–44 years. As well, Zanettini stated in Cordeiro et al. that TMD prevails in the age group 20–40 years. Oliveira et al. also stated in Cordeiro et al. that TMD often occurs in the age group of 20–30 years.[17] The prevalence of TMD is low in children, increases during adolescence and young adulthood, and appears to peak in middle age, but it decreases in the elderly. The prevalence of TMD peaks in the age group 20–40 years.[2] The years 20–40 are considered the productive years, during which humans are at the peak of their activity.

This study showed that TMD is considered 1.5 times more prevalent in women than in men. However, it found no statistically significant association between gender and TMD. The results agree with several studies that found TMD is more common in women than in men.[3,8,18] Himawan et al., however, found TMD to be more common in elderly men than women. They also found no statistically significant association between gender and TMD in the elderly.[7] The different results may

be due to the larger number of female subjects than male subjects. According to the literature, the high prevalence of TMD in women might be related to physiologic differences of the feminine gender, such as regular hormonal variations, muscular structure, and the different characteristics of the conjunctive tissue.[18]

This study showed no statistically significant association between TMD and socio demographic factors, such as gender, economic level, and education level. Sener and Akgunlu also reported no statistically significant association between TMD and economic and education level.[19] However, Kusuma found that gender, the area of residences, and economic level play important roles in TMD. They were related with TMD statistically. This might be because the patterns, lifestyle, and economic level in the two areas studied were different.[20] Bagis et al. found a statistically significant association between TMD and age.[3] The different results obtained in this study may be due to the fact that the subjects age range is less extensive; therefore, the association between TMD and age was difficult to detect.

From 115 subjects, 59 were categorized as having TMD. The most common symptoms often felt by subjects are a pain in the neck and surrounding area, headache, and often a hard pressure when bringing together the upper and lower teeth when in fully concentration (clenching). Headache and neck pain in patients with TMD may be associated with muscle pain. Pain is related to muscle activity, which is in the TMJ muscles. It usually is felt when patients chew or speak. Parafunctional activities, such as clenching and grinding, can cause hyperactivity of the masticatory muscles associated with the contact of teeth, jaw movement, and increased muscle contraction. Excessive forces applied during parafunctional activity can cause tooth wear and strain on masticatory muscles.[2]

This study found a statistically significant association between TMD and quality of life. Individuals with TMD also tend to have a lower quality of life, with a higher score of OHIP-TMD. Lemos et al., who examined 135 subjects with an age range of 18–25 years using questionnaires OHIP-14, also found a statistically significant association between TMD and quality of life. Individuals with TMD have a

higher OHIP-14 score.[21]

Kusuma, found a statistically significant association between TMD and quality of life in elderly subjects.[20]

This study found no statistically significant association between socio demographic factors (age, gender, economic level, and education level) and quality of life related to orofacial pain. These outcomes are in agreement with Kusdhany et al., who found that there was no statistically significant association between age, education level, and quality of life.[22]

Similar findings were obtained by Zheng et al., who found no significant association between socio demographic factors and quality of life.

They also found that there is no difference between the quality of life of male and female TMD patients.[23] Vivi, also reported that there was no significant association between age, gender, education level, and quality of life.[15] Wiryasmoro, however, found that there is a statistically significant association between economic level and quality of life.[24] Yen et al. also suggested that individuals with low education levels have a lower quality of life compared to individuals with higher education levels. Individuals with low education levels have lower expectations and awareness toward the importance of oral health and the negative impacts to their quality of life.[25]

The different results obtained in this study may be that the proportion of subjects with high to low education levels were not balanced, where subjects with high levels of education were predominate with a percentage of 92.2%.

The weakness of this study was a less varied age range. The prevalence of TMD is seen only in the age group 20–40 years; therefore, the study inadequately covered that age group of Indonesians. The diversity of diagnoses in patients with TMD cannot be detected because ID-TMD is only a screening tool.

The economic levels were divided only by the amount of income; therefore, it does not specifically assess the economic level of subjects who do not have an income, such as students and housewives. Furthermore, OHIP-TMD is not sensitive enough to assess the quality of life of subjects without TMD. In addition, OHIP-TMD cannot be used for epidemiological surveys.[14]

Conclusion

This study showed that TMD was related to the quality of life of orofacial pain. However, there was no relationship between TMD and quality of life with socio demographic factors (age, gender, education level, and economic level).

Acknowledgments

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