Quality of life analysis of fixed orthodontic treatment by denturists

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ABSTRACT

***Background**: Riskesdas data in 2018 showed a 57.6% dental and oral problems prevalence. One of the abnormalities of the teeth and mouth is malocclusion. Malocclusion can be fixed by performing orthodontic treatments performed by orthodontist dentists. However, because orthodontic care requires a considerable cost, those with low economy and education look for alternatives by performing orthodontic treatments to dental artisans. Objectives: This study evaluates the patient's quality of life (QoL) with fixed orthodontic treatment by dental artisans (denturists) using the OHIP-14 questionnaire.*

***Methods**: The research method used is descriptive observational, where samples are taken by random sampling of the 67 patients who used fixed orthodontic treatment by denturists. This research applied a cross-sectional study conducted by collecting data only using the OHIP-14 questionnaire at a time without further investigation. The data analysis applied was the Univariate Statistical test.*

***Results**: The results of the total score obtained from the dimensions of functional limitations are 238 (moderate category), physical pain is 220 (moderate category), psychological discomfort is 205 (moderate category), physical disability is 232 (moderate category), psychological disability is 225 (moderate category), social disabilities is 230 (moderate category), the barriers is 246 (bad category).*

***Conclusion**: Several factors caused denturists' impaired QoL of patients in fixed orthodontic treatment, with six as moderate categories and one as poor.*

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INTRODUCTIONS

Dental health is an essential aspect of everyday life. For example, our teeth have an important role in speech and chewing and can affect the shape of our faces. Teeth formation is considered normal if the occlusion between teeth on the upper and lower jaw is in a balance harmony stage.[1] However, based on the Indonesian National Database of Basic Health 2018 (RISKESDAS 2018), the prevalence of dental problems is considered high (57.6%), with the highest case being malocclusion.[1]

Malocclusion is a formation disorder of the teeth that can have different types.[2] Malocclusion is not a disease, but if it is ignored, it can disturb our speech ability, the shape of the face, chewing movement, and swallowing1. Malocclusion can be fixed with orthodontic care that orthodontists can deliver.[3] Unfortunately, orthodontic care in Indonesia is costly. People in a middle-low income class usually look for another alternative called a denturist. In Indonesia, denturists who do not work according to their field are illegal yet people still look for them because they offer a cheap cost.[4]

Denturists have no authority to deliver orthodontic care. So they used cheap products and materials that were not approved for safety. In addition, denturists usually learn their skills by watching videos on social media which do not include explanations for side effects like loosening teeth, bacterial infection, headaches and others. These side effects can affect the quality of life (QoL) of a patient.[5,6]

QoL is a unique opportunity to feel comfortable and maintain psychological health in line with physiological and social health in the patient's daily life. Mental, physical, and emotional states also affect the quality of life assessment. The occurrence of physical disorders, and psychological and cognitive functions related to chewing, smiling, and self-confidence will reduce the value of QoL.[7]

QoL in dentistry can be measured by oral health-related quality of life (OHRQoL). This measurement includes a multidimensional concept, such as patients' estimation of well-being related to various psychological factors (personal appearance, self-esteem), factors related to pain and discomfort (acute and chronic), functional factors (chewing, swallowing, and speaking) and social factors (social interaction, communication, socialization). OHRQoL can be measured by filling out the oral health impact profile-14 (OHIP-14) questionnaire, which contains 14 questions regarding limitations of oral and dental function, aches and pains, feelings of psychological discomfort, and social disorders.[8]

With the description above, researchers are interested in researching dentists' QoL of fixed orthodontic treatment.

METHODS

This descriptive observational study has received research ethics approval from the Dental Faculty of UNISSULA Research Ethics Commission with ethical clearance number: 284/B.1-KEPK/SA-FKG/VI/2021. The population in this study were all patients who underwent fixed orthodontic treatment at a dental practice in Semarang. Our study is a cross-sectional study using 67 people as a sample. An accidental sampling technique was used for this study. Data analysis was done using a univariate statistical test.

RESULTS

This study aims to describe the QoL of fixed orthodontic treatment by dentists. The study consisted of 67 respondents who performed fixed orthodontic treatment by a dentist. The following are the characteristics of the research sample:

Table 1. Characteristic Distribution

Sample characteristics		n = 67 (n)	(%)
Gender	Male	29	43,3
	Female	38	56,7
Age	17 - 19	24	35,8
	20 - 22	16	23,9
	23 - 25	23	34,3
	> 25	4	6,0
Address	Semarang city	49	73,1
	Outside Semarang city	18	26,9
Last Education	No school	0	0,0
	Elementary school	1	1,5
	Junior high school	19	28,4
	High school	29	43,3
	Diploma	6	9,0
	Bachelor	12	17,9
Income	Yes	36	53,7
	No	31	46,3
Monthly income	< Rp. 1.000.000	16	23,9
	Rp. 1.000.000 - Rp. 2.000.000	11	16,4
	Rp. 2.000.000 - Rp. 3.000.000	7	10,4
	> Rp. 3.000.000	2	3,0
Number of family to taking care of	0	16	23,9
	1 - 2	16	23,9
	3 - 4	4	6,0
	> 4	0	0,0
Duration of orthodontic treatment	1 month	28	41,8
	> 1 month	39	58,2

Table 2 shows the characteristics of each research sample, total 67 respondents. Respondents were then given the OHIP-14 questionnaire to determine the QoL of users of fixed orthodontic treatment by dentists. The results of the OHIP-14 questionnaire obtained the following data:

Table 2. Classification of QoL based on OHIP-14

No.	Dimension OHIP-14	Item OHIP-14	Score	QoL Good ≤ 89,33	QoL Enough 89.33 - 245.67	QoL Bad ≥ 245,67
1	Function limitation	Speech difficulty	226	-	√	-
		Taste difficulty	230	-	√	-
2	Physical pain	Great pain	218	-	√	-
		Discomfort when eating	232	-	√	-
3	Physical discomfort	Anxiety	193	-	√	-
		Tense	217	-	√	-
4	Physical disability	unsatisfied eating specific food	228	-	√	-
		eating discomfort	234	-	√	-
5	Psychic disability	Difficulty of sleep	237	-	√	-
		feel embarassed	212	-	√	-
6	Social disability	Disturbed by other people	228	-	√	-
		Difficulty of doing job	231	-	√	-
7	Limitation	Not satisfy with life	243	-	√	-
		Inability to do activity	248	-	-	√

Table 2 shows the QoL of users of fixed orthodontic treatment by dental professionals based on OHIP-14 questions.

The QoL results were calculated using the *Kolmogorov-Smirnov* normality test because the sample used was more than 50. The results of the normality test are presented in the following table:

Table 3. Statistical analysis of QoL

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Score for quality of life	0,088	67	.200*	0,973	67	0,144

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

The results of the normality test using the Kolmogorov-Smirnov showed that the data on the quality of life for fixed orthodontic treatment by

dentists was normally distributed ($p > 0.05$) so that statistical tests were carried out using univariate statistical tests. The results of the Univariate Statistics test are presented in the following table:

Table 4. The score of QoL Statistics

Score for QoL		
N	Valid	67
	Missing	0
Mean		47,45
Median		48,00
Mode		48
Min		19
Max		66
Std. Deviation		10,795
Skewness		-0,453
Std. Error of Skewness		0,293
Kurtosis		-0,065
Std. Error of Kurtosis		0,578
Range		47
Percentiles	25	40,00
	50	48,00
	75	55,00

The results indicate that the average QoL data from 67 respondents who use fixed orthodontic treatment by dentists is 47. In addition, the mode value or the value that occurs the most is 48, and the range from the lowest to the highest data is 47.

DISCUSSION

The study was conducted between May-June 2021 in Semarang with a total sample of 67 people who used fixed orthodontic treatment. Based on gender, the data obtained from research respondents were primarily women (n=38). This result indicates females tend to use fixed orthodontics compared to the male gender. In addition, adult females are usually starting to pay more attention to appearance to boost their self-confidence.[8]

Most respondents who use fixed orthodontic appliances range from 17-19 years old (n=24). The latest education majority is high school (n=29). Most respondents who use fixed orthodontic appliances range from 17-19 years old (n=24). The latest education majority is high school (n=29). This result showed that most of the fixed orthodontic treatment respondents were more concerned with their appearance.[5]

Based on the respondents' income who use fixed orthodontic appliances, from 36 respondents, 16 have the highest income of fewer than one million rupiahs, and 16 have dependents of 0 and 1-2, respectively. This result showed that respondents are classified as having low income in that socioeconomic group.[9]

Based on the respondents who used the fixed orthodontic appliances for more than one month, as many as 39 respondents, this was possible because fixed orthodontic treatment took a long time to get the desired results depending on the severity of the case, age and patient's attitude to common control.[8] In addition, respondents feel uncomfortable when using fixed orthodontics by dental artisans. This result showed that patients with fixed orthodontic treatment by dental artisans are more concerned with appearance than the destructive consequences of the failed treatment.[5]

Univariate statistical tests were used because the data were normally distributed ($p>0.05$). A total of 67 respondents who used fixed orthodontic treatment by dental artisans as measured by OHIP-14 gave poor QoL results.

In Dimension 1, Functional Limitations consists of 2 question items, the 67 respondents who chose frequent answers were 41 respondents and very often 26 respondents. This finding is possible because fixed orthodontic treatment by an inappropriate dental hygienist will exacerbate the malocclusion, resulting in difficulty speaking and causing the problem of tasting food.[10]

As seen in Dimension 2, Physical Pain consists of 2 question items. However, of the 67 respondents who chose frequent answers were 48

respondents and very often 19 respondents. This finding is due to the pressure on the teeth through fixed orthodontic appliances, which causes severe pain and eating discomfort.[11]

In Dimension 3, Psychic Comfort consists of 2 question items. Of the 67 respondents who chose frequent answers were 47 respondents and very often 20 respondents. This data showed that people have a high perception that anxiety would arise due to the pain caused when using fixed orthodontics.[12]

As viewed on Dimension 4, Physical Disabilities consists of 2 question items, of the 67 respondents who chose frequent answers were 43 respondents and very often 24 respondents. This finding is because when using fixed orthodontics, pain is caused by pressure on the teeth when chewing hard food or puncturing the gums by orthodontic appliances which cause the cessation of chewing while eating due to pain.[13]

Dimension 5 as Psychic Disabilities consists of 2 question items. Of the 67 respondents who chose frequent answers were 38 and very often 29. This finding is because foreign objects or fixed orthodontic appliances attached to the teeth make it difficult to relax.[14]

As seen in dimension 6, social disability consists of 2 question items. Of the 67 respondents frequent answers were 40 respondents and very often 27. In this case, people perceive that when using a fixed orthodontic appliance, they will feel pain in their oral cavity, making them more sensitive. As a result, people who use fixed orthodontic appliances have poor dental alignment, causing a lack of self-confidence and an unsatisfactory life12.

In Dimension 7, Inhibition consists of 2 question items. Of 67 respondents who chose frequent answers were 51 and very often 16. These findings are possible because dental artisans' fixed orthodontic treatment does not follow the procedures done by orthodontic specialists.[15]

Based on the QoL analysis for fixed orthodontic treatment by dental artisans, there are 6 dimensions in the moderate category and 1 in the poor category. These results indicate that the tools installed by dental artisans tend to produce uncontrolled tooth movement and feel quite painful to the patient, making the patient uncomfortable. This finding is what ultimately affects the patient's quality of life. In Navabi's study (2012), about 16% of patients or respondents experienced discomfort caused by the use of fixed orthodontic appliances, which negatively affected their quality of life caused by pain and discomfort. In addition, tooth movement that occurs due to fixed orthodontic treatment causes discomfort.[12]

This study has limitations, including the difficulty of finding respondents who fit the inclusion criteria and the lack of interviews with dental artisans. In addition, in this study, there was only one subject group and no control or comparison group.

CONCLUSION

The level of QoL for fixed orthodontic treatment by dental artisans has 6 dimensions in the moderate category and 1 in the poor category.

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