

## Knowledge description of adolescent ages 14-18 years about side effects of using fixed orthodontics

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### Keywords:

Knowledge; fixed orthodontics; side effects

### ABSTRACT

**Background:** The use of fixed orthodontics is not a new thing for the community. The rapidly increasing information has changed people's understanding of the use of fixed orthodontic appliances where the initial function of fixed is for health, but along with changes in one's knowledge, the use of fixed orthodontics has turned into a style or trend that aims to make the appearance more attractive. Most of the youth are currently doing fixed orthodontic treatment only for a lifestyle, trend or style without knowing the complaints and goals of fixed orthodontic treatment. In addition, most teenagers do not know the orthodontic treatment that should be carried out by orthodontic specialist dentists. This study aims to specify the description of adolescents aged 14-18 years in SMA Negeri 1 Belitang, South Sumatra province regarding the side effects of using orthodontic appliances.

**Method:** This is a descriptive observational using a cross sectional study. The sampling technique used is total sampling with a total of 50 respondents.

**Result:** The results of the study revealed that adolescents' knowledge of the side effects of using fixed orthodontic appliances was in the good category of 13 subjects (26%), sufficient category 29 subjects (58%), and less category 8 subjects (16%).

**Conclusion:** The conclusion of this study is that the knowledge possessed by adolescents aged 14-18 years at SMA Negeri 1 Belitang, South Sumatra Province regarding the side effects of using orthodontic appliances is quite good in as many as 29 subjects (58%).

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## Introduction

Along with the development of an increasingly advanced era, orthodontic science continues to develop, and people increasingly need to realize that other functions of teeth are not only tools for chewing food, but also has a very important role in appearance. Some people who receive orthodontic treatment have very diverse motivations, one of which is fixed orthodontic treatment because it has become a trend in aesthetics<sup>1,2</sup>.

Many teenagers in Belitang district currently use fixed orthodontic appliances. The use of fixed orthodontics is not a new thing for the community. Through access to information media, which is growing rapidly at this time, it is easier for fixed orthodontic users to receive colorful wires from fixed orthodontics which are usually sold freely on *online* store sites so that they are not half-hearted to spread a smile by displaying the colorful orthodontic appliances they wear<sup>3</sup>. This is one of the most popular trends among teenagers, the rapidly growing information supporting users of fixed orthodontic appliances, has changed people's understanding of the use of fixed orthodontic appliances. The initial function of using orthodontic appliances is for health, but along with changes in one's knowledge, the use of fixed orthodontic appliances changes its function into a style or trend that aims to make the appearance more attractive<sup>4,5</sup>.

Currently, the number of orthodontic specialist dentists in Indonesia is still very small, namely 6% of the total number of dentists in Indonesia. For the Belitang area, based on data from the East Ogan Komering Ulu district government, there are 8 general dentists, while the General Hospital Health Service Facilities data in

the East Ogan Komering Ulu district does not yet have orthodontic specialists dentists. Based on research conducted by Masulili (2010), a total of 78.8% of respondents chose specialist dentists, 17.7% chose general dentists and 3.3% chose dental artisans<sup>6</sup>. General dentists have different powers from orthodontic specialist dentists, in carrying out their practice general dentists and orthodontic specialists must be aware of the authority they have in carrying out treatment actions. General dentists have authority in dental cases, while orthodontic specialists have authority in dental, skeletal, and dentoskeletal cases<sup>7</sup>.

Regarding the use of orthodontics, there are two laws that form the basic basis, namely *haram* and permissible. The use of orthodontics is prohibited if the aim is to change the appearance without a cause that requires and prioritizes physical interests over spiritual interests. The use of orthodontics is said to be permissible if a person has a defect in his teeth, for example, his teeth are crooked, the arrangement of his teeth is uneven so it is difficult to chew food, some of his teeth are very forward or very backward so that it is difficult and painful to close the mouth, therefore it is classified as defective and is allowed to perform orthodontic treatment<sup>8</sup>. Recently, there have been many phenomena of using fixed orthodontics just for a trend, fashion or just wanting to join in, which actually doesn't need to be used when teeth are in normal condition. If the patient undergoing orthodontic treatment is not cooperative during treatment and ignores the procedures recommended by the dentist, it will cause adverse effects for fixed orthodontic users. The impact that arises is in the form of poor *oral hygiene*, the emergence of *Recurrent Aphthous Stomatitis (RAS)*, temporomandibular joint disorders, root resorption, gingival recession, caries, periodontal tissue disorders, and allergic reactions<sup>9</sup>.

Previous research conducted by Arifin (2016) on knowledge of the side effects of using fixed orthodontic appliances at SMAN 4 Banda Aceh, with the number of students based on the researcher's criteria and meeting the research inclusion criteria of 96 students. The results showed that most of the research subjects were 68 students (70.9%) had moderate knowledge, 25 students (26%) had high knowledge, and 3 students (3.1%) had low knowledge<sup>5</sup>. Yohane's (2013) research on knowledge of dental and oral hygiene of high school students obtained results, that female students paid more attention to dental and oral hygiene than male students. Because female students tend to pay more attention to their appearance than male students<sup>10</sup>.

Based on the description above, the researchers wanted to see a description of the knowledge of adolescents aged 14-18 years at SMA Negeri 1 Belitang, South Sumatra province regarding the side effects of using fixed orthodontic appliances. Researchers chose high school teenagers because currently the use of fixed orthodontic appliances among teenagers is only used as a fashion or lifestyle and today's teenagers are also more concerned with their appearance to socialize<sup>11</sup>. In addition, most teenagers do not know that orthodontic treatment should be carried out by orthodontic specialist dentists, therefore researchers are interested in conducting research.

## RESEARCH METHODS

The following research is a *descriptive observational* using a *cross sectional study design*. A sample of 50 students was obtained using a *total sampling technique* with criteria for students aged 14-18 years at SMA Negeri 1 Belitang.

The questionnaire used contains 25 questions, using the *Guttman* scale which has been

tested for validity and reliability tests. Because this research instrument uses a questionnaire with a *Guttman* scale, to get the level of validity of the questionnaire using the reproducibility coefficient and the scalability coefficient<sup>12</sup>.

Reproducibility Coefficient (Kr)<sup>12</sup>.

$$\begin{aligned} Kr &= 1 - (e/n) \\ &= 1 - 70/750 \\ &= 1 - 0,09333 = 0,91 \end{aligned}$$

The reproducibility coefficient for the instrument test results is considered to have met the requirements because the acceptance requirements for the reproducibility coefficient are > 0.90.

Scalability Coefficient (Ks)

$$\begin{aligned} Ks &= 1 - \left(\frac{e}{c(n)}\right) \\ &= 1 - \left(\frac{70}{0,5(750)}\right) \\ &= 1 - \left(\frac{70}{375}\right) \\ &= 1 - 0,18 = 0,81 \end{aligned}$$

In calculating the scalability coefficient, if the Ks value > 0.60 is considered good for use in research.

The reliability test in this study uses the *Kuder Richardson 20* formula, often referred to as KR 20.

The formula for total variance:

$$\begin{aligned} S_t^2 &= \frac{\sum x_t^2 - \frac{(\sum x_t)^2}{n}}{n} \\ &= \frac{13537 - \frac{(621)^2}{30}}{30} \\ &= \frac{13537 - \frac{385,641}{30}}{30} \end{aligned}$$

30

$$= \frac{13537-12,854}{30} = \frac{682,3}{30}$$

$$= 22,74$$

The fomula for KR-20

$$r_{11} = \left(\frac{k}{k-1}\right) \left(\frac{S_t^2 - \sum p.q}{S_t^2}\right)$$

$$= \left(\frac{25}{25-1}\right) \left(\frac{22,74-3,14}{22,74}\right)$$

$$= \left(\frac{25}{24}\right) \left(\frac{19,6}{22,74}\right)$$

$$= 0,897$$

It can be concluded that the reliability value of KR 20 is  $0.897 > 0.89$  acceptable, because a reliability value of less than 0.6 is not good, while 0.7 is acceptable and above 0.8 is good.

Researchers searched for and collected research subjects according to the criteria, then asked for approval from the school to request personal data from the subject and asked for research approval. After the subjects were collected, the researchers *chatted* with the subjects to ask for their willingness to participate in this study, then after the subjects agreed, the researchers would send a *google form* containing the *informed consent and questionnaires* that had been made. After the questionnaires were collected, the next stage was data analysis.

The analysis of the following research data is a univariate analysis to observe the description of the knowledge of adolescents aged 14-18 years in SMA Negeri 1 Belitang, South Sumatra Province regarding the side effects of using fixed orthodontic appliances, using SPSS. This research has been approved by the Research Ethics Committee with the Ethical Eligibility Number 336/B.1-KEPK/SA-FKG/XII/2021.

## RESULTS

The results of the study on the description of the knowledge of adolescents aged 14-18 years in SMA Negeri 1 Belitang, South Sumatra Province regarding the side effects of using fixed orthodontic appliances are as follows:

### 1. Characteristics of Research Subjects

Were analyzed using univariate analysis which only produced distribution, frequency, and percentage, for example, the frequency distribution of respondents in this study was based on age, gender and adolescent knowledge about the effects of fixed orthodontics.

Table 1 Frequency Distribution of Respondents by Gender

Gender	Respondent	Percentage
Male	13	26 %
Female	37	74 %
Total	50	100 %

Table 2. Frequency Distribution of Respondents by Age

Age	Respondent	Percentage
14 Years	4	8 %
15 Years	6	12 %
16 Years	13	26 %
17 Years	13	26 %
18 Years	14	28 %
Total	50	100 %

**2. Overview of Adolescent Knowledge of the Side Effects of Using Fixed Orthodontic Appliances**

Table 3 Frequency Distribution of Adolescent Knowledge regarding Side Effects of Using Fixed Orthodontic Appliances

Knowledge	Respondent	Percentage
Good	13	26 %
Enough	29	58 %
Less	8	16 %
Total	50	100 %

15 Years	1 (2%)	3 (6%)	2 (4%)	6 (12%)
16 Years	3 (6%)	9 (18%)	1 (2%)	13 (26%)
17 Years	3 (6%)	7 (14%)	3 (6%)	13 (26%)
18 Years	4 (8%)	9 (18%)	1 (2%)	14 (28%)
Total	13 (26%)	29 (58%)	8 (16%)	50 (100%)

**3. Overview of Adolescent Knowledge of Side Effects of Using Fixed Orthodontic Devices Based on Gender**

Table 4 Distribution of Respondents' Knowledge Frequency by Gender

Gender	Knowledge			Total
	Good	Enough	Less	
Male	2 (4%)	7 (14%)	4 (8%)	13 (26%)
Female	11 (22%)	22 (44%)	4 (8%)	37 (74%)
Total	13 (26%)	29 (58%)	8 (16%)	50 (100%)

**4 Overview of Adolescent Knowledge of Side Effects of Using Fixed Orthodontic Appliances Based on Age**

Table 5 Frequency Distribution of Respondents' Knowledge by Age

Age	Knowledge			Total
	Good	Enough	Less	
14 Years	2 (4%)	1 (2%)	1 (2%)	4 (8%)

**DISCUSSION**

Based on the results of the study, the overall knowledge of SMA Negeri 1 Belitang students regarding the side effects of using fixed orthodontic appliances was included in the sufficient group. The results of the following study are in line with research<sup>13</sup> which states that the knowledge about the oral hygiene of orthodontic users of school students is in the sufficient group.

The following study aims to describe the knowledge of adolescents aged 14-18 years at SMA Negeri 1 Belitang, South Sumatra province regarding the side effects of using fixed orthodontic appliances. Knowledge is all ideas, ideas, concepts, and abilities possessed by individuals and then poured in the form of answers, both written and oral. Knowledge is also influenced by age, education, experience, environment, and socio-culture. Experience is perceived, obtained, and believed, thus giving rise to motivation and intention to act<sup>14,15</sup>. The results of the following research are included in the sufficient group (58%) because the knowledge possessed by each respondent is different, it is influenced by several factors, one of which is environmental factors. The environment is one of the factors that can influence individuals or

groups in carrying out an action and changing behavior in each individual. The theory developed by *Piaget* also supports that adolescent knowledge can be obtained based on environmental factors. Adolescents will actively receive information and thought processes that are modified by their respective<sup>16</sup>.

Table 4 shows the results of female students having better knowledge than male students. This result is in line with the research of Yohanes (2013) that female students have better knowledge because female students pay more attention to dental and oral hygiene than male students, this is because female students are more concerned with and have high awareness of their appearance, so female students tend to keep their teeth and mouth clean. The phenomenon of using fixed orthodontic appliances shows that female respondents have a higher need for appearance and aesthetics. Appearance or aesthetics is one of the factors that influence individuals in using fixed orthodontic appliances<sup>10,17</sup>.

Table 4.5 shows the results of students who have knowledge in the medium category, dominated by the age group of 16 years and 18 years, namely 9 students (18%). One of the factors that affect a person's knowledge in thinking, acting, and learning is the age factor. In the following study, the age factor had no effect on knowledge. These results are also in line with Arifin's research (2016) which states that "the age factor does not really affect the level of care needs, where the level of knowledge of each age level is still in almost the same category." In the following study, the age difference is not too far, which is only 1 year, and is still in a phase called middle adolescence, so the level of knowledge of each age group is still relatively the same. The development of knowledge in each teenager must be different, some teenagers have a level of knowledge that is easy to

understand and step by step. The difference is because each teenager has different biological and genetic elements, then environmental factors also affect cognitive development in each teenager. According to the flow of convergence, individual cognitive development is actually determined by basic/innate factors as well as environmental/educational factors, both of which will determine a person's development<sup>5,18</sup>.

Generally, middle teens are in a period of searching for an identity that encourages the emergence of a desire to get the best, especially healthy teeth. Adolescents have a desire to take care of their teeth through orthodontic treatment in order to get satisfaction with the appearance of their teeth<sup>19</sup>.

During the implementation of this study, researchers encountered several obstacles including, the following research was carried out during a pandemic so it was difficult for researchers to conduct direct interactions or face-to-face activities with students of SMA 1 Belitang, so researchers found it difficult to obtain research data quickly and could not directly Provide education to students about dental and oral health. Suggestions for further research are expected to be able to examine the role of orthodontists to provide education to adolescent patients who use fixed orthodontic appliances regarding the effects that will be caused if used for a long time and not used according to the procedure.

## CONCLUSION

Based on the research that has been carried out, a conclusion can be drawn, namely, the knowledge of adolescents aged 14-18 years at SMA Negeri 1 Belitang, South Sumatra province regarding the side effects of using fixed orthodontic appliances is quite good as many as 29 students

(58%). Knowledge of female students is higher than male students. The female gender has sufficient knowledge of 22 students (44%), and the male gender has sufficient knowledge of 7 students (14%).

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