

Knowledge Assessment of Bad Habits in Children's Oral Cavity Related to Malocclusion

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ABSTRACT

Background: Bad oral habits are one of the factors that influence the occurrence of malocclusion. Knowledge and understanding of bad oral habits are needed early on to avoid or reduce the severity of malocclusion. The Covid-19 pandemic has prevented face-to-face education, but this can be overcome by providing online education. **Objective:** This study aimed to determine the level of knowledge of bad oral habits in elementary school-age children regarding the occurrence of malocclusion through online education. **Materials and Methods:** This cross-sectional analytic study was conducted on grade 5 students at SD Kartika 1-11 Padang City who met the inclusion and exclusion criteria. The selection of respondents was carried out by using a purposive sampling technique. Education is carried out online with the Zoom application. The stages of the activity consist of filling out the pre-test, educating students, asking questions, and filling out the post-test. Student knowledge was measured using a questionnaire consisting of 10 closed questions with a value of 1 if the answer was correct and a value of 0 if the answer was wrong. The research data were processed using the SPSS statistical application. **Results:** A significant relationship exists between pre-test and post-test knowledge before the intervention. This proves that there is an increase in students' understanding after being given the intervention. Based on the treatment effectiveness test/gain score results, the result was 0.6. So it can be concluded that the intervention provided has moderate effectiveness. **Conclusion:** A holistic evaluation of changes in behavior and practices in daily life needs to be done to evaluate the success of educating about bad oral habits that can cause malocclusion as a whole.

Keywords: Children, Bad Habits, Malocclusion, Oral Cavity

ABSTRAK

Latar Belakang : Kebiasaan buruk rongga mulut merupakan salah satu faktor yang mempengaruhi terjadinya maloklusi. Pengetahuan dan pemahaman tentang kebiasaan buruk rongga mulut dibutuhkan sejak dini untuk menghindari atau mengurangi keparahan terjadinya maloklusi. Situasi pandemi Covid-19 menghalangi pemberian edukasi secara tatap muka, namun hal ini bisa diatasi dengan pemberian edukasi secara daring. **Tujuan :** Tujuan penelitian ini adalah untuk mengetahui tingkat pengetahuan kebiasaan buruk rongga mulut pada anak usia sekolah dasar terhadap terjadinya maloklusi melalui edukasi secara daring. **Materi dan Metode :** Penelitian analitik cross sectional ini dilakukan kepada siswa kelas 5 SD Kartika 1-11 Kota Padang yang memenuhi kriteria inklusi dan eksklusi. Pemilihan responden dilakukan dengan teknik purposive sampling. Edukasi dilakukan secara daring dengan aplikasi Zoom. Tahapan kegiatan terdiri dari mengisi pre test, edukasi siswa, tanya jawab, dan mengisi post test. Pengetahuan siswa diukur menggunakan kuisioner yang terdiri dari 10 pertanyaan tertutup yang diberi nilai 1 jika jawaban benar dan nilai 0 jika jawaban salah. Data penelitian diolah dengan aplikasi statistik SPSS. **Hasil.** Terdapat hubungan yang signifikan antara pengetahuan pre test sebelum intervensi dengan pengetahuan post test. Hal ini membuktikan bahwa terjadi peningkatan pemahaman siswa setelah diberikan intervensi. Berdasarkan hasil uji efektifitas perlakuan/gain score didapatkan hasil sebesar 0,6. Sehingga dapat disimpulkan bahwa intervensi yang diberikan memiliki efektifitas sedang. **Kesimpulan.** Evaluasi yang holistic tentang perubahan perilaku dan praktik dalam kehidupan sehari-hari perlu dilakukan untuk mengevaluasi keberhasilan edukasi kebiasaan buruk rongga mulut yang dapat menyebabkan maloklusi secara keseluruhan.

Kata Kunci: Anak-anak, Kebiasaan buruk, Maloklusi, Rongga mulut,

1. Introduction

Malocclusion is a deviation from the usual relationship of teeth in the same or opposite dental arches. Occlusion is expected if the teeth' arrangement in the angle is correctly aligned to create a harmonious relationship between the upper and lower jaw teeth.¹ According to WHO and Riskesdas, malocclusion is the third most common oral disease after dental caries and periodontal disease. The prevalence of malocclusion in Indonesia has reached 80% of the Indonesian population.² Because of its high prevalence, malocclusion is considered a public health problem that can interfere with a

patient's quality of life-related to appearance, speech, chewing, and swallowing disturbances, inhibit social interaction, and affect patient psychology.³

The etiology of malocclusion is divided into intrinsic and extrinsic factors. Intrinsic factors called hereditary such are abnormalities in teeth' number, shape, and size. Outside factors are malnutrition, bad oral habits such as mouth breathing, thumb sucking, sticking out the tongue, nail-biting, bruxism, propping up the chin, sucking and biting the lips, trauma or accidents, ankylosis, caries, early loss and retention of primary teeth.⁴ This disorder can be passed from parents to their children. While extrinsic factors are related to environmental factors or bad habits that occur in the oral cavity, such as malnutrition, mouth breathing, nail-biting, bruxism, propping up the chin, sucking and biting the lips, and accidents that cause trauma to the teeth and jaw.⁵

Loss of teeth, both baby and permanent, can also cause malocclusion. Caries and retention of milk teeth can also affect the growth and development of the surrounding permanent teeth. It is essential to know that malocclusion can be caused by a single factor or a combination of several factors.⁶ Therefore, to treat malocclusion, it is necessary to carry out a careful and detailed evaluation of the causative factors so that the treatment can be more precise and effective. Studies on the level of knowledge of bad oral habits in elementary school-age children about malocclusion can help in understanding and preventing the causes of malocclusion in children. Good knowledge about bad oral habits such as mouth breathing, nail-biting, bruxism, and thumb sucking can help parents or guardians monitor and control these habits in children. It can reduce the risk of malocclusion caused by extrinsic factors.⁷ A study can be conducted by taking a sample of elementary school-aged children from several schools, then giving a questionnaire about bad oral habits and knowledge about malocclusion to parents or guardians of students. In addition, a clinical examination can also be carried out by a dentist to find out whether the child has a malocclusion or not.⁸ The results of this study can help provide education and better understanding to parents or guardians of students about bad oral habits and the importance of maintaining healthy teeth and jaws in children. It is expected to help prevent malocclusion in elementary school-age children and improve their quality of life.⁹

Learning about bad oral habits in elementary school-age children is very important because these bad habits can cause malocclusion, namely poor positioning of the teeth and jaws, which can interfere with the function and aesthetics of the oral cavity. Malocclusion can cause health problems such as difficulty chewing food, headaches, toothaches, and sleep disturbances, affecting speech and physical appearance.¹⁰ Elementary school-age children are in a critical period in oral cavity development, in which teeth and jaws are developing and not yet stable. Bad habits of the oral cavity that occur in this period can cause changes in the development of the jaw and teeth, leading to malocclusion. Therefore, learning about bad oral habits in elementary school-age children can help prevent malocclusion and reduce the risk of oral health complications in the future.¹¹ In addition, a good understanding of bad oral habits in elementary school-age children can assist in diagnosing and planning appropriate treatment in case of malocclusion. Thus, knowledge of bad oral habits in elementary school-age children is fundamental for dentists, orthodontists, and parents to maintain oral health and prevent health complications in the future.¹²

2. Material and Methods

This cross-sectional analytic study was conducted in June 2021 at Kartika 1-11 Elementary School, Padang City. The respondents of this study were grade 5 students at SD Kartika 1-11 Padang City. The inclusion criteria are children aged 10-11 years, cooperative, and willing to be research respondents. Exclusion criteria were students who were not present during the research. Student knowledge was measured using a questionnaire consisting of 10 closed questions with a value of 1 if the answer was correct and a value of 0 if the answer was wrong. The stages of research activities included obtaining research permits, determining research respondents, dividing research respondents into small groups of 5 people, and dividing research instructors' work. On the day of the research, the stages of the activity were asking students to do a pre-test by filling out a questionnaire on an electronic form, educating students about bad oral habits that can cause malocclusion virtually via Zoom, and conducting a post-test by asking students to fill out a questionnaire. Education is delivered through storytelling, and research data is processed with SPSS statistical software.

3. Result and Discussion

Education about bad oral habits that can lead to malocclusion is carried out virtually through the Zoom application for 5th-grade students at SD Kartika 1-11 Padang City. There were no significant obstacles during the implementation of this research. All parties involved helped and supported the implementation of this research. Students actively listened to educational material and filled out pre and post-test questionnaires. Table 1 reports that the frequency distribution of each question above concluded that there was an increase in scores between 0-35.3%. At the time of the Post, Test Score on each question was above 50%. From the table above, question number 9 did not experience an increase in score. Questions 1 and 5 shared the highest score increase among the other questions, as much as 35.5%. It can be seen that the frequency distribution of each question in the pre-test ranges from 41.2-82.4% to 58.8-94.1% in the post-test after the intervention.

Table 1. Distribution and frequency of pre and post-test question scores

Question	Pre Test		Post Test		Enhancement
	True	%	True	%	%
Do you know the definition of bad oral habits?	7	41	13	76.5	35.3
Do you know the causes of bad oral habits?	10	58.8	15	88.2	29.4
Do you know the factors that influence the occurrence of bad oral habits?	7	41.2	14	82.4	41.2
Did you know that thumb-sucking is a bad oral habit?	12	70.6	16	94.1	23.5
Did you know that sticking out your tongue is a bad oral habit?	8	47.1	14	82.4	35.3
Did you know that breathing through your mouth is a bad oral habit?	9	52.9	14	82.4	29.5
Did you know biting and sucking your lips is a bad oral habit?	11	64.7	13	76.5	11.8
Did you know that biting your nails is a bad oral habit?	14	82.4	15	88.2	5.8
Do you have bad oral habits?	10	58.8	10	58.8	-
Do you know the treatment for dealing with bad oral habits?	10	58.8	14	82.4	23.6

Based on the reports submitted, there was an increase in the average knowledge of respondents after the intervention was 3.49 from 5.69 in the pre-test to 9.18 in the post-test. Table 2 reports that the average respondent's knowledge increased from 5.76 ± 3.437 in the pre-test to 8.12 ± 2.233 in the post-test. The statistical test results showed a p-value of 0.009, meaning a significant relationship existed between pre-test and post-test knowledge before the intervention. The interventions have increased students' understanding of the topics studied. However, to assess the success of an intervention, it is not only the knowledge factor that needs to be considered but also changes in students' behavior and practices in everyday life related to the topic being studied. Therefore, a holistic evaluation needs to be done to evaluate the success of the intervention as a whole.

Table 2. Description of student knowledge and the increase in the average knowledge of research subjects

Knowledge	N	Mean	SD	SE	Min-Max	P-value	Δ
Pre Test	17	5.76	3.437	0.834	0-10	0.009	2.35
Post Tes	17	8.12	2.233	5.42	2-10		

Gain Score Index Rating: ≥ 0.7 (High Effectiveness) $0.7 > g \geq 0.3$ (Moderate Effectiveness); < 0.3 (Low Effectiveness). Assessment of the effectiveness of the intervention was analyzed and used the Gain test with the following formula: $\text{Gain Score Test} = \frac{\text{post-test score} - \text{pre test score}}{\text{max score} - \text{pre test score}} = \frac{8,12 - 5,76}{10 - 5,76} = 0,6$. So it can be concluded that the intervention provided has moderate effectiveness. Malocclusion is a deviation from the usual relationship of teeth in the same or opposite dental arches. Occlusion is expected if the teeth' arrangement in the angle is correctly aligned to create a harmonious relationship between the upper and lower jaw teeth. The etiology of malocclusion is divided into intrinsic and extrinsic factors. Intrinsic factors include abnormalities in teeth' number, shape, and size. Outside factors are malnutrition, bad oral habits such as mouth breathing, thumb sucking,

sticking out the tongue, nail-biting, bruxism, propping up the chin, sucking and biting the lips, trauma or accidents, ankylosis, caries, early loss and retention of primary teeth.

Mouth breathing can be caused by obstruction of the normal airways through the nose or habit. This bad habit of breathing through your mouth shows the appearance of short upper and lower lips, so you can't completely close your mouth without effort.¹³ Mouth-breathers usually have a narrow face, anterior teeth advanced labially, and lips parted with the lower lip behind the lower incisors. Patients with a bad habit of mouth breathing also experience a lack of stimulation of the tongue muscles, causing a narrow and deep V shape of the maxilla. Bad mouth breathing habits also result in protrusion of the anterior maxillary teeth and anterior open bite.¹⁴



Figure 1. Bad habit of thumb sucking resulting in maxillary contraction, maxillary anterior protrusion, and anterior open bite.

Figure 1 reports that thumb sucking is common in childhood, but prolonged thumb sucking can cause malocclusion. Characteristics of malocclusion caused by the bad habit of thumb sucking occur due to a combination of direct pressure from the thumb and changes in the pressure pattern on the cheeks and lips. The cheek pressure at the corner of the mouth against the posterior maxillary teeth increases due to the contraction of the buccinators while sucking together, making the maxilla deep and V-shaped.

In addition, the constant pressure on the front teeth due to thumb sucking can cause the front teeth to move forward from their normal position (protrusion) and the back teeth to go deeper (retrusion). It can also affect the growth and development of the jaw, leading to more severe malocclusions such as excessive overjet and open bite.¹⁵ Continuous thumb sucking can also affect the growth of the jawbone and affect a child's facial development, so it is essential to avoid this bad habit and seek help if your child continues to suck the thumb after a certain age.¹⁶

Figure 2 reports that the habit of sticking out the tongue can also be caused by inappropriate bottle feeding and is usually accompanied by other bad habits such as thumb sucking, lip biting, and nail biting. The habit of sticking out the tongue that occurs continuously can cause an open bite and incomplete overbite, and the position of the tip of the tongue is more anterior than its normal position. The habit of sticking out the tongue that occurs continuously can cause several dental and jaw problems, such as open bites and incomplete overbites, as well as the position of the tip of the tongue that is too forward.¹¹ This is especially true for children still growing and developing their teeth and jaws.

Several factors, such as inappropriate bottle feeding, inappropriate use of pacifiers, and other bad habits such as thumb sucking, lip biting, nail biting, or certain neuromuscular disorders, usually cause this habit of sticking out the tongue.¹⁶ Therefore, avoiding these habits and carrying out appropriate interventions is necessary if dental and jaw problems are associated. Prevention can be done by providing proper bottle feeding, avoiding inappropriate pacifiers, eliminating other bad habits such as thumb sucking, lip biting, and nail biting, and consulting a dentist if teeth and jaw problems are related to this habit. This can help prevent dental and jaw problems caused by sticking out the tongue in children.¹⁷



Figure 2. The bad habit of sticking out the tongue accompanied by thumb sucking causes an open bite. The tip of the tongue is more anterior than its normal position.

Figure 3 reports that the bad habit of propping up the chin puts excessive, prolonged, and continuous pressure on the joint, which can cause a torn disc or meniscus, resulting in dislocation of the temporomandibular joint. If this happens continuously, the condyle can pass through the disc and collide with the bone, causing a clinking sound called clicking. This can also occur with the opposite movement. Often this sound is not accompanied by pain, so the patient does not realize that the clicking sound is a symptom of temporomandibular joint disorders.¹⁸

The bad habit of propping up the chin can put excessive and prolonged pressure on the temporomandibular joint, which can cause a torn disc or meniscus, resulting in the dislocation of the temporomandibular joint. If this happens continuously, the condyle can pass through the disc and collide with the bone, causing a clinking sound called clicking.¹⁹ It can also occur in the opposite motion. Often this clicking sound is not accompanied by pain, so the patient is unaware that the clicking sound is a symptom of temporomandibular joint disorders.²⁰ However, if these symptoms continue, they can trigger more serious symptoms such as headaches, neck pain, ear pain, and prolonged jaw pain. Therefore, it is imperative to avoid the bad habit of leaning on the chin and make appropriate interventions if symptoms of temporomandibular joint disorder are associated with the habit.²¹

Prevention can be done by avoiding the bad habit of propping up the chin and avoiding a head position that is too low or too high when working or studying. In addition, it is also necessary to relax the jaw and neck muscles regularly and consult a dentist or dental and oral specialist if there are symptoms of temporomandibular joint disorders associated with the bad habit of propping up the chin.¹¹ Lip sucking is an abnormal habit carried out continuously, consciously and unconsciously, and usually done on the lower lip. Sucking lips often leads to other bad habits, such as sticking out the tongue. Bad oral habits are considered abnormal in children over three years of age. Bad lip sucking is less common than bad oral habits, but abnormal sucking can lead to malocclusion.¹⁴

The reason someone has a lip-sucking habit is thought to be due to environmental factors and psychological factors. Several studies have reported manifestations in the oral cavity due to lip-sucking practices such as large overjet, second-class molar relationship, and anterior open-bite and posterior crossbite.²² Lip sucking is often a compensatory activity resulting from excessive overjet and difficulty closing the lips during swallowing. The habit of biting the lip is a habit that is done repeatedly on the lower lip. Biting the lips will cause the upper teeth to move anteriorly abnormally.²³ Biting the lower lip will also move the lower jaw teeth lingually and the upper jaw teeth anteriorly. The consequences of biting the lower lip are protrusion of the maxillary anterior teeth, retrusion of the mandibular anterior teeth, soft tissue inflammation, and anterior open bite.²⁴



Figure 3. The bad habit of propping up the chin, which damages the temporomandibular joint, causes clicking, and the face becomes asymmetrical

In general, malocclusion is when the teeth are not appropriately positioned in the jaw and can be caused by various factors, including bad habits in the oral cavity.²⁵ Some bad habits that can cause malocclusion in children include sucking thumbs or pacifiers, biting nails, biting complex objects, and breathing through the mouth. If these bad habits continue for years, they can lead to changes in the growth and development of the jaws and teeth, eventually leading to malocclusion. Therefore, parents and dentists must monitor children's bad oral habits and take preventive measures, such as providing thumb pads or safe pacifiers or motivating children not to bite their nails or complex objects. Early prevention can help reduce the risk of malocclusion and promote optimal dental and jaw health in later adulthood.²⁶

4. Conclusion

In conclusion, a holistic evaluation of changes in behavior and practices in daily life is essential to comprehensively assess the success of educating about bad oral habits that can cause malocclusion. While setting individual bad habits provides valuable insights into specific factors contributing to malocclusion, it is crucial to consider the broader context of a child's lifestyle and habits to evaluate the effectiveness of educational efforts. Educating children, parents, and caregivers about the detrimental effects of bad oral habits is crucial in promoting proper oral health and preventing malocclusion. However, the impact of this education can only be fully understood by assessing changes in behavior and practices over time. It is necessary to evaluate whether the knowledge imparted through education translates into functional changes in daily life.

A holistic evaluation may involve gathering information through interviews, surveys, or observations to assess the adoption of healthy oral habits and the cessation of harmful practices. This evaluation should encompass a range of factors, including the frequency and duration of thumb sucking, pacifier use, mouth breathing, and prolonged bottle feeding. Additionally, it should consider other relevant aspects such as improved oral hygiene practices, dietary modifications, and incorporating preventive measures. By evaluating changes in behavior and procedures, we can determine the success of educational initiatives in creating lasting and positive oral habits. This assessment can also help identify any challenges or barriers children, parents, or caregivers face in implementing these changes and provide insights for further improvement in educational strategies.

Moreover, a long-term follow-up is crucial to monitor the sustainability of the behavior changes and their impact on malocclusion prevention. Longitudinal studies can provide valuable data on the persistence of positive habits and their association with reduced prevalence and severity of malocclusion over time. In conclusion, a comprehensive evaluation that considers changes in behavior and practices in daily life is necessary to assess the overall success of educating about bad oral habits related to malocclusion. This holistic approach provides a more accurate understanding of the effectiveness of educational efforts and informs future interventions aimed at promoting optimal oral health and preventing malocclusion in children.

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Authors Contribution

Contribution	Syafitri FU	Arini M
Concepts or ideas	V	V
Design	V	V
Definition of intellectual content	V	
Literature search		V
Experimental studies	V	
Data acquisition	V	
Data analysis	V	
Statistical analysis		V
Manuscript preparation	V	V
Manuscript editing	V	V
Manuscript review	V	V



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