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THE CORRELATION BETWEEN DENTAL MALOCCLUSION TO MIDLINE SHIFT AND BODY POSTURE OF JUNIOR HIGH SCHOOL STUDENTS

Wahyuni Dyah Parmasari[1], Enny Willianti[1], Theodora[1]

1. Faculty of Medicine, Universitas Wijaya Kusuma Surabaya

Correspondence: wd.parmasari@uwks.ac.id

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ABSTRACT

Background: The number of teenagers standing up straight according to normal posture is minimal. This results in it is becoming a habit, so the body posture is not ideal in adolescence when the growth pattern is still ongoing. Early detection and intervention can help mitigate the impact of these issues on the student's overall health, function, and quality of life.
Methods: The design of this research is a cross-sectional and analytic observation. 70-person respondents were 1st-grade students at Junior High School 56 Surabaya.
Outcome: In this study, the p-value obtained, was 0.06, a significant difference between the incidence of malocclusion in midline shift and body posture.
Conclusion: There is a correlation between dental malocclusion to midline shift and body posture.

INTRODUCTION

Nowadays, children like various kinds of school bags, especially backpacks. Junior High Schools prefer the use of backpacks, because carrying bags or what are called backpacks are popular with school children to carry school supplies, such as notebooks, textbooks, and stationery according to their school needs. The use of a backpack is provided that it is used properly and correctly, and that it is not used on one side only. A backpack that is used on one side will cause the user's body shape to become ugly. Using a backpack that is too big and heavy will cause pain in the back and other parts of the body.[1]

The use of backpacks among school children in Denpasar Bali shows that 77.9% use backpacks, 20.8% shoulder bags, and the remaining 1.3% use other bags. The problem for school children with their body condition is using school bags, with excessive weight it will cause problems. Research conducted by Luh Ita Mahendrayani (2018) shows that there is a significant relationship between the use of heavy bags and back pain in school children in children aged 12-14 years in Denpasar. It was also shown that students with bag loads between 6 kg – 13 kg were 38.7%.[2]

Excessive use of backpacks can cause body problems and will hurt the user. Continuous use and

incorrect habits of using a backpack can result in irreversible changes. Heavy loads on the back can be an acute risk, both in the short term and can result in chronic and can also have long-term impacts. Backpacks with heavy loads are one of the factors that occur in school children and have an impact on back pain. Body posture is shaped by the body frame. Abnormalities in body posture are caused by many things, such as abnormalities in body shape such as abnormalities in the spine in the form of kyphosis, lordosis, scoliosis, or due to abnormalities in changes in body shape that occur due to long-standing habits such as sitting in the wrong position on one side or carrying heavy burdens frequently and continuously. long. If this continues, it will change the shape of the body's posture.[3]

Postural deformities and Malocclusion are physical conditions that can cause significant problems and injuries during adolescent development. Postural balance in the development of scoliosis is related to dentofacial problems or malocclusion.[4] Scoliosis is a three-dimensional deformation of the spine, defined as a lateral deviation of greater than 10 degrees in the frontal plane, associated with axial rotation, located at the cervical, thoracic, and lumbar levels. There are several types of scoliosis: congenital, neuromuscular, and idiopathic. Idiopathic scoliosis is the most common type of scoliosis and has a multifactorial etiology (genetic predisposition of metabolic, hormonal, and biomechanical factors). This often appears at any age and is more common in adolescence, as many as 90% of cases show a right-sided thoracic curve, this causes the initial prevalence of adolescent idiopathic scoliosis to be between 0.47% and 5.2%.[5]

The incidence rate of malocclusion in Indonesia is still high, namely around 80%, and is considered the third cause of dental and oral health problems after dental caries and periodontal disease.[5] Hereditary or acquired factors can cause the etiology of malocclusion. As obtained, habit factors have a fairly high role where the intensity, frequency, and duration of the bad habit can cause malocclusion. Placing the body posture that is not ideal for a long-time result in disorders of the musculoskeletal system. This allows a malocclusion to occur. Moreover, this bad habit is carried out during the growth period. Epidemiological data suggests that early prevention can reduce the prevalence of malocclusion to plan appropriate orthodontic treatment.[6] A review found that there are six studies that demonstrated a positive association between various forms of malocclusion and scoliosis. The skeletal class III and torticollis, kyphosis and sagittal position of the mandible, overjet, and pelvic torsion, crossbite, and scapula plane are additional significant relationships. Crossbite, crowding, increased overjet, overbite, partly open bite, and midline deviation are among the problems caused by the major impact that adolescent idiopathic scoliosis has on the stomatognathic system. Working together, between orthodontists and orthopedists can provide comprehensive therapy, especially during the formative stage.[7] Therefore, the preparation of this research aims to investigate

whether there is a relationship between body posture and dental malocclusion in patient samples in several previous research journals.

METHOD

This research combines cross-sectional methods and observational analysis. The ethical clearance (EC) No.75/SLE/FK/UWKS/2023 was approved by the Ethic Commission of Medical Faculty Wijaya Kusuma University. The samples of this study were 70 students at Junior High School 56 Surabaya students, in September 2023. This study uses anthropometric parameters of weight in kilograms and height in meters. The inclusion criteria were all the students use backpacks in their daily activity, it takes use the backpack between 3-4 hours or more a day. The exclusion criteria were if there was a history of congenital defects. Two orthodontists and a general practice observed midline shifts and malocclusions. They were determining according to Angle's classification, Class I, II, or III malocclusion and assessing whether there was a midline shift in the upper and lower jaw. The orthodontist immediately observes clinically, judging from the relationship between the first molar and canine teeth. while the midline shift is seen using the method using a digital caliper, the shift of the mandibular midline to the right or left concerning the maxillary midline was measured and evaluated on each patient's occlusions.[8] Body posture was measured by the respondent standing up straight with perfect posture and then looking at the balance of the left and right shoulders. Statistical analysis to see the relationship between the dependent and independent variables using SPSS using the ANOVA test, with a degree of significance value ρ=0,05.

RESEARCH FINDINGS

Table 1. Sample distribution based on gender

Gender	Amount (person)	Percentage(%)
Female	40	57,14 %
Male	35	42,14%
Total	70	100 %

As shown in Table 1, from 70 respondents. There were 40 female respondents' percentage of 57,14% and 35 male respondents' percentage of 42,14%.

Table 2. Distribution of gender with the incidence of malocclusion, midline shift, and body posture

Gender	Malocclusions		Midline Shift		Body Posture	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
FEMALE	35	50,00%	40	57,14%	14	20%
MALE	25	35,71%	15	21,42%	5	7,14%
TOTAL	60	85,71%	55	78,56%	19	27,14%

Table 3. The Correlation Between Malocclusions to Midline Shift and Body Posture

Malocclusions	Midline Shift		Body Posture		ρ-value
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	
Class I	14	25,45%	9	47,36%	0,06
Class II	9	16,36%	9	47,36%	
Class III	1	1,82%	1	5,28%	

DISCUSSION

In the daily activities of students in Indonesia, they require the use of bags to carry schoolbooks. There are various types of bags nowadays, one of which is often used is the backpack model. Everyday teaching and learning activities are very busy, resulting in students bringing various school necessities. For example, textbooks, changes to school clothes, extra-curricular activities, and so on, so that the backpack carried by each student becomes heavy or excessively burdened. This is something that students carry with them every day and especially for students aged 10-15 years, where this age is the golden period for growth and development and will have an influence on the formation of body posture.[9] An imbalance between the neuromuscular temporomandibular joint (TMJ) and the masticatory system is known as malocclusion. It is thought to have a complex origin since it is the culmination of genetic, environmental, and postural factors.[10] If the student's knowledge is lacking, this will result in asymmetrical body posture, and if left untreated, this will result in back pain and scoliosis. The benefits and objectives of this activity are to provide educational counseling regarding the habit of using heavy backpacks on body posture and malocclusion in junior high school students.[11]

The World Health Organization (WHO) states that malocclusion is an anomaly that causes damage or obstruction to the function of the occlusion, which requires treatment if the anomaly affects the patient's physical condition and emotional (psychological) state. Meanwhile, malocclusion is a deviation from the relationship between the teeth and the relationship between the upper and lower jaw. The degree of severity of malocclusion varies from low to high due to skeletal and dental factors.[12] Skeletal views from panoramic and cephalometry photos can be obtained from the upper jaw being too prominent, namely protrusion, and conversely, the relationship between the lower jaw is more prominent namely retrusion. Malocclusion can cause unfavorable aesthetics because the crowded arrangement of the teeth causes a tendency to have high caries, and periodontal disease, and if severe, disorders of the temporomandibular joint can occur[13] Saccussi et.al. review found that the conclusion is reasonable evidence of higher incidence of unilateral Angle class II malocclusions linked to scoliosis, based on a few chosen research. Additionally, there is evidence that scoliosis and a decreased range of lateral motions are related. Information regarding the correlation between scoliosis and plagiocephaly is also provided. Only two investigations showed this result, which was deemed positive for the deterioration of static equilibrium but without any clinical application and another positive for

the improvement of dynamic balance. It was determined that malocclusion is linked to the posture of the alterations because of the balance.[6,14] This research was also accompanied by education on how to use a backpack properly and correctly. So, it is hoped that these teenagers can improve their posture before their growth period stops.[12] If scoliosis is at an advanced level, education alone is not enough. So, improvements to the body are made using orthopedic equipment, such as physiotherapy, using an orthopedic vest and low impact exercise such as swimming because it can still be corrected and is still growing.[15,16]

CONCLUSION

There is a correlation between dental malocclusion to midline shift and body posture from 70-person respondents who were 1st-grade students at Junior High School 56 Surabaya. This makes adolescence a golden period as the key to improving body posture.

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