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Research paper

Description of malocclusion based on Dewey modified angle classification in mentally disabled on special need education in Jember district, Indonesia

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Abstract

Introduction: Malocclusion is a condition of disharmony between the teeth, jaw bones, skull bones and muscles which is often found in mentally retarded children. Limitations in taking care of themselves and the absence of early and routine socialization to maintain oral health are causes of malocclusion in children. mentally disabled.
Objective: This study aims to identify features of malocclusion based on the modified Dewey Angle classification in mentally retarded children in special schools in Jember Regency, East Java, Indonesia.
Method: This quantitative descriptive research involved 105 mentally retarded students from five special schools in Jember Regency who were selected proportionally. Data collection was carried out through intraoral examination using basic dental instruments to assess the relationship between the upper and lower first molars.
Results: The results showed that the prevalence of Angle malocclusion was 72.4% with the highest classification being Angle class I at 59.0%, followed by class III at 8.6% and class II at 4.8%. Dewey modification for class I shows type 1 as the dominant type (17.1%) in frequency multiple highest in combined type 1 and type 2 (13.3%).
Conclusion: The results of this study provide an important contribution in identifying and treating dental health problems in children with intellectual disabilities, and provide a basis for developing oral health care and education strategies.

Keywords: *Angle Classification; Angle's Dewey Modification; Dental Health; Malocclusion; Mentally Retarded.*

1. Introduction

Mental retardation is a category of intellectual disability that appears before the age of 22 years, characterized by below average intelligence (IQ <70) due to neurodevelopmental deficits in the form of impaired adaptive behavior and limited intellectual function.[1] There are limitations for the mentally retarded so they need special education at Special Schools (SLB), which are designed for cope their limitations with teaching methods and a supportive learning environment. [2] Based on preliminary survey data, there are 142 people with mental retardation who are actively registered at school in Jember Regency SLB with a tendency to have various kinds of problems related to the oral cavity. This is due to their own limitations and the absence of early and routine socialization to maintain oral health.
Individuals with intellectual disabilities are susceptible to various dental and oral health problems, especially malocclusion. Malocclusion is a condition of disharmony between teeth, jaw bones, skull bones, and muscles with varying levels of severity for each individual.[3] Malocclusion have The high risk for mentally retarded sufferers is due to various causes, namely limitations in caring for themselves so that they have difficulty maintaining oral hygiene, which causes caries to occur and results in tooth loss or tooth shifting which is involved in malocclusion.[4] The presence of bad habits such as breathing through the mouth (mouth breathing), thumb sucking, nail biting, tongue sticking out, lip biting, and other bad oral habits.[5] The presence of certain genetic conditions such as Fragile X syndrome And Prader-Willi syndrome which affects skeletal development which can be the cause of malocclusion.[6] [7]
Malocclusion identification can be classified using various methods. One method that is often used is Angle which is based on the relationship of the maxillary and mandibular first molars. Angle relations have advantages over other classifications because they are currently still used in dentistry because they are simple, easy to use, and comprehensive.[8] However, aside from the advantage, Angle's classification still has several limitations so modifications are needed. Modification Angle classification was carried out by Dewey in 1915 who modified Angle class I and Angle class III.[9] Process identification Malocclusion in mentally retarded children is carried out by intraoral examination, this examination is a simple and easy to understand method. This is important because the intellectual limitations of mentally retarded children make it difficult for them to understand more complex examination procedures [10]

2. Methods

This research is a quantitative descriptive study which aims to identify features of malocclusion based on the modified Dewey Angle classification in mentally retarded children in special schools in Jember Regency, East Java, Indonesia. The five SLBs selected to carry out the research were SLB Branjangan Jember, SLB YPAC Kaliwates, SLB Balung, SLB C TPA Java, and SLB Negeri Jember. The population numbers in the five SLBs are based on preliminary survey data through interviews with one of the students or teachers at SLB Branjang, SLB YAPC, SLB Balung, SLB C TPA, and SLB Negeri Jember. It was found that the population in this study was 142 mentally retarded sufferers who were actively attending school based data from August to November 2024. Proportionately from five special schools, 105 mentally retarded children were selected as subjects using the purposive sampling.

The variables examined in this study were Angle Malocclusion Class I, II, III and Modified Dewey Class I, there were 5 types, and Class III there were 4 types. Angle Malocclusion determined based on the relationship of permanent 1st molar and canine teeth identified through intra-oral examination, namely:

1) Class I Angle classification occurs when cusp mesiobuccal maxillary first molar that occludes buccal groove mandibular first molar and cusp The mesial of the upper canine is between the lower canine and the lower first premolar. [9]
2) Angle Class II classification is characterized by cusp The distobuccal of the maxillary first molar occludes mesiobuccal groove mandibular first permanent molar And cusp The mesial of the upper canine is located more mesially than the lower canine. Class II is further categorized into division 1 (maxillary incisor protrusion), division 2 (maxillary incisor retrusion), and subdivision (class II malocclusion on one side of the jaw only). [11]
3) Class III molar classification is characterized by the mesiobuccal cusp of the maxillary first molar occluding distal to the groove mesiobuccal lower first molar And cusp The mesial of the upper canine is located more distally than the lower canine. [9]

Dewey's modification in this study is a modification of Angle's classification identified through intra-oral examination, namely:

1) Class I in 5 types, namely type 1 anterior teeth are crowded or crowded, type 2 anterior teeth are labioverted or protruded, type 3 anterior teeth are palatoverted and crossbite anterior, type 4 palatoverted maxillary molars and/or premolars (crossbite posterior), and type 5 exist shift permanent molars mesially. [8]
2) Class III in 4 types namely type 1 The upper and lower dental arches are separately aligned normally, but when bitten they show a relationship edge to edge, type II characterized by mandibular incisors crowded pushed and located in a lingual position relative to the maxillary incisors, type III characterized by the maxillary incisor crowded and experience crossbite towards the mandibular incisors, and subdivision if the class III malocclusion is on one side of the jaw only. [11]

Data analysis was carried out descriptively so that data was obtained in the form of Angle classification data and Dewey modification data on mental retardation. Determining the prevalence of malocclusion is carried out by calculating percentages and data presented in the form of tables and diagrams.

3. Results

Based on the data obtained from the research, data was obtained from 105 students who had carried out research to describe malocclusion Angle Dewey modification implemented at Jember Regency SLB in 2024.

Table 4.1: Frequency Distribution of Research Subjects Based on SLB Location

No.	School name	Results of research subjects
1.	Branjangan Jember Special School	18
2.	YPAC Kaliwates Special School	20
3.	ABC Special School Balung	19
4.	C Special School TPA Jawa	17
5.	Jember State Special School	31
Total		105

Table 4.2 and Figure 4.1 show the research results in the form of the frequency distribution of research subjects based on gender.

Table 4.2: Frequency Distribution of Research Subjects Based on Gender

	Frequency	Percentage
Female	55	52,4%
Male	50	47,6%
Total	105	100%

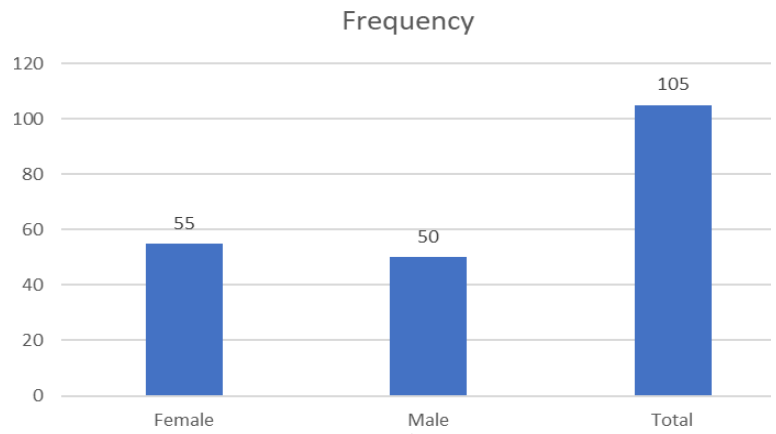

Fig. 4.1: Frequency Distribution Graph of Research Subjects Based on Gender.

Based on table 4.3 and picture 4.2, obtained research data of 105 subjects with an average age of 12 years.

Table 4.3: List of Age Distribution of Research Subjects

Age (Years)	Frequency	Percentage
6	2	1,9%
7	7	6,7%
8	10	9,5%
9	14	13,3%
10	15	14,3%
11	13	12,4%
12	12	11,4%
13	7	6,7%
15	5	4,8%
16	6	5,7%
17	5	4,8%
18	4	3,8%
19	3	2,9%
20	2	1,9%
Total	105	100%

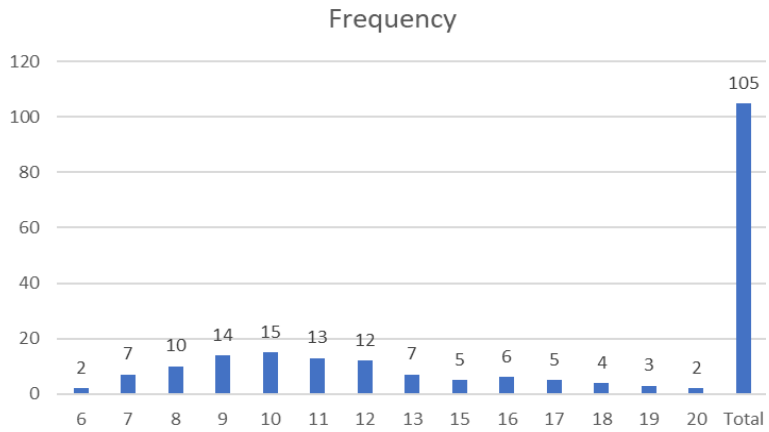

Fig. 4.2: Graph of Age Distribution of Research Subjects.

Angle classification frequency distribution results from 105 research subjects in table 4.4 and figure 4.3.

Table 4.4: Frequency Distribution of Research Subjects Based on Angle's Classification

	Frequency	Percentage
No relations	24	22,9%
Class I Angle	62	59%
Class II Angle	5	4,8%
Class III English	9	8,6%
Edge to edge	5	4,8%
Total	105	100%

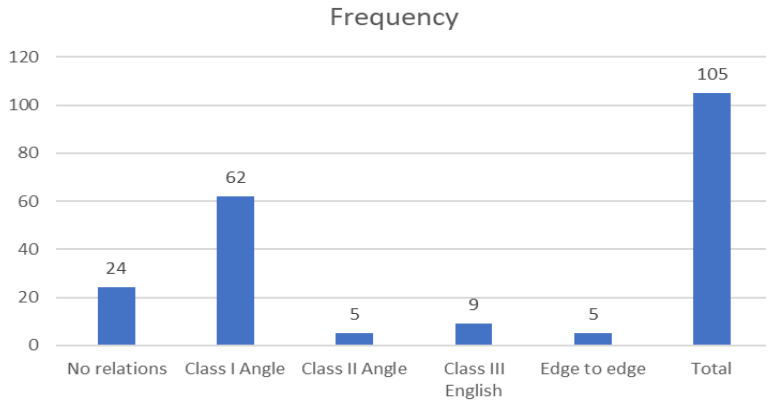

Fig. 4.3: Distribution Graph of Research Subjects Based on Angle's Classification.

The results of the frequency distribution of Angle class II classification from 5 research subjects are in table 4.5 and figure 4.4.

Table 4.5: Frequency Distribution of Research Subjects Based on Angle Class II Classification

	Frequency	Percentage
Class II (Division 1)	4	3,8%
Class II (Division 2)	1	1%
Total	5	4,8%

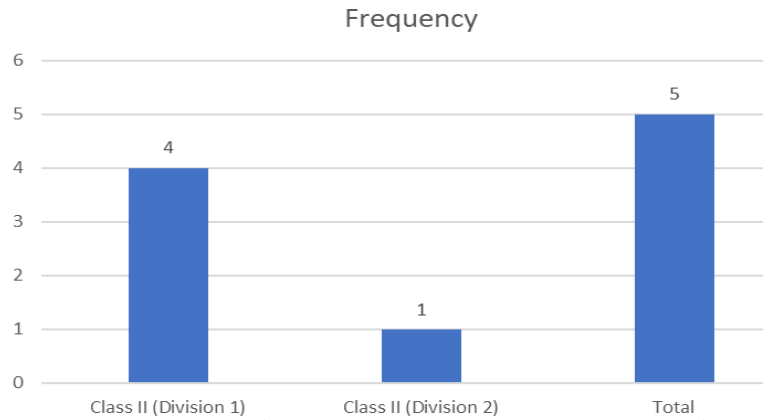

Fig. 4.4: Distribution Graph of Research Subjects Based on Angle Class II Classification.

Based on table 4.6 and figure 4.5, the results of the distribution of Angle class I malocclusion for 62 subjects (59.0%) were classified with the Dewey modification.

Table 4.6: The Frequency Distribution of Research Subjects Is Based on Angle Class I Classification with Dewey Modification

	Frequency	Percentage
Modified Dewey type 1	18	17,1%
Modified Dewey type 2	8	7,6%
Modified Dewey type 3	2	1,9%
Modified Dewey types 1 and 2	14	13,3%
Modified Dewey types 1 and 3	4	3,8%
Modified Dewey types 1 and 4	5	4,8%
Modified Dewey types 2 and 4	2	1,9%
Modified Dewey types 1,2, and 4	5	4,8%
Other disorders	3	2,9%
Total	62	59%

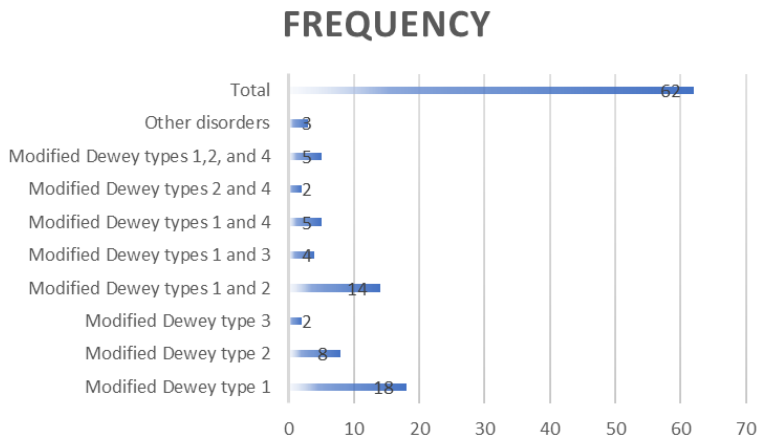

Fig. 4.5: Frequency Distribution Graph of Research Subjects Based on Angle Class Classification with Dewey Modification.

Class III Angle malocclusion classification data for 9 subjects (8.6%), classified into Dewey modification in table 4.7 and figure 4.6, obtained Dewey modification data in the form of monotype.

Table 4.7: Frequency Distribution of Research Subjects Based on Angle Class III Classification with Dewey Modification

	Frequency	Percentage
Modified Dewey type 1	4	3,8%
Modified Dewey type 2	4	3,8%
Modified Dewey Subdivision	1	1%
Total	9	8,6%

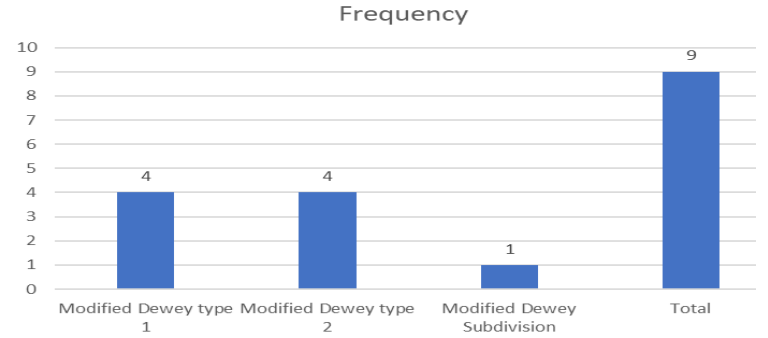

Fig. 4.6: Frequency Distribution Graph of Research Subjects Based on Angle Class III Classification with Dewey Modification

4. Discussions

The research was carried out from October 2024 to November 2024 by taking data on mental retardation in five special schools in Jember Regency in 2024. This data is in the form of the results of the Dewey modified Angle malocclusion examination. In this study, the research subjects were 105 respondents, with 18 subjects from SLB Branjangan, 20 subjects from SLB YAPC, 19 subjects from SLB Balung, 17 subjects from SLB C TPA, and 31 subjects from SLB Negeri Jember. The number of subjects who were examined based on the overall results in the 5 special schools in Jember Regency met the minimum sample of 105 subjects, but the sample distribution in each special school was different, there were some special schools which had more subject results than they should and there were special schools which had fewer subjects. than it should be. The reason there are special schools that experience a shortage of research subjects is because many students don't cooperative and there were several parents of the research subjects who were not happy, so the shortage was taken from several other SLBs which had more students cooperative and parents of subjects from other special schools who are willing to be examined. The results of the frequency distribution of 105 research subjects based on gender consisted of 50 subjects (47.6%) who were male and 55 subjects (52.4%) who were female. The difference in the prevalence of malocclusion in this study was due to the unequal number of female and male subjects. This is based on 2019 East Java BPS data which states that there is a different distribution of the mentally retarded population in each region. Study [12] stated that gender distribution also plays a role in the condition of severe malocclusion, malocclusion tends to occur in women as much as 51% and men 49%. The study also reported that patients with severe malocclusion require special attention because it can affect function and aesthetics and impact their quality of life and social interactions. [13]

The results of the study showed that most of the mentally retarded children had cases of Angle malocclusion with a percentage as much as 72.4%. The results of research on the identification of malocclusion in the mentally retarded based on Angle's classification showed that the largest percentage of malocclusion occurred in class I Angle as many as 62 subjects (59.0%), class III Angle as many as 9 subjects (8.6%), class II Angle as many as 5 subjects (4.8%). The results of the high prevalence of malocclusion in mentally retarded children are likely due to their intellectual limitations so they cannot prevent oral health problems and their lack of concern for maintaining oral health because most of these mentally retarded have never seen a dentist. This also has similarities with research by [14] conducted on 269 children aged 9 to 12 years, with the greatest prevalence of malocclusion in class I with 217 subjects (80.7%), followed by class III with 33 subjects (12.2%), and class II with 19 subjects (7.1%). [14] These findings are in line with research [15] who found a Class I prevalence of 65% in children with special needs. The high prevalence of Class I can be caused by poor oral hygiene, pattern food cariogenik, and limited access to service tooth. Angle class I data results which are more common in children with special needs, including mental retardation, are caused by motor, sensory or intellectual limitations that influence the ability to maintain oral hygiene, as well as a diet that is less supportive of dental health. [16]

The results of the data obtained also showed that there was no relationship between the molar or canine teeth in 24 mentally retarded children (22.9%) as well as the data with the second largest results after Angle class I. Most of the loss of molar or canine teeth based on the results of this study was due to caries. . This is in accordance with research [17], which found that in children with mental retardation or intellectual disabilities there was a high prevalence of conditions with dental caries. [17] Children with intellectual disabilities are also found to have hypomineralization of molar teeth which makes the teeth more susceptible to caries and tooth decay. [18] Case outcome data edge to edge in mentally retarded children as many as 5 subjects (4.8%), the majority of edge to edge cases that occurred in mentally retarded children showed tooth enamel that appeared worn due to abnormal contact of the upper jaw and lower jaw teeth. This is proven by research [19] which states that the case edge to edge can cause abnormal enamel attrition, fractures, temporomandibular disorders and movement of the anterior teeth. [19]

The results of research regarding the classification of Angle class II showed that the highest results were for Angle class II division 1 with 4 subjects (3.8%), followed by Angle class II division 2 with 1 subject (1%). The results of this class II data mostly occur in mentally retarded children with moderate IQ category as many as 3 samples (75%). Good. Most facial images of the mandible in moderately mentally retarded children show that the maxilla is more advanced and the mandible is smaller or located further back. The results of this study also have similarities with research [20] which was carried out on 466 subjects, with results of Angle class II division 1 classification of 108 subjects, and followed by Angle class II division 2 of 6 subjects. In one type of child mentally disabled moderate category, namely with abnormalities Prader-Willi syndrome There are also cases of orofacial muscle dysfunction which cause bad habits such as bruxism and breathe through the mouth. Individuals with disturbance Prader-Willi syndrome mandible was found returned with a Class II skeletal pattern (<12 years), the lower face is longer, increasing the risk of overjet and deep bite with a Class II skeletal pattern (12-20 years). [7]

The data results show that the frequency monotype The highest number of Angle Class I modified Dewey classifications was type 1 with 18 subjects (17.1%), followed by type 2 with 8 subjects (7.6%). Then, research results monotype The smallest was in the Angle class I modified Dewey type 3 classification of 2 subjects (1.9%). In most of the mentally retarded children who were researched, it was found that there was a high accumulation of plaque and caries due to poor teeth crowded or Angle class I category with modified Dewey type 1. The results of this study are similar to research [21] performed on children with special needs, with the results of Angle class I malocclusion being the most frequently found (35.7%), followed by crowding (50%), and certified abnormal (28,6%). [21] Malocclusion that occurs with crowded teeth will make it difficult to maintain oral health and lead to plaque buildup, so this can be a predisposing factor for gingivitis. [22]

Some of the existing literature does not specifically discuss Dewey's modification classification, however [23] And [24] explains that children with intellectual disabilities have a higher risk of experiencing malocclusion. This is caused by motor limitations that affect oral muscle function, limitations in oral care, use of drugs that can affect oral conditions, and difficulty carrying out dental care independently. Factors causing malocclusion in retardation Mental or mental retardation is caused by loss of space in permanent teeth which causes problems orthodontics and also due to abnormal jaw development factors. In addition, in children with retardation mental habits were also found to have bad habits such as lip biting, bite buccal mucosa, and finger biting. [25]

Frequency data with multitype The largest classification of Dewey's modified Angle class I in type 1 and type 2 was 14 subjects (13.3%), followed by type 1 and type 4 with 5 subjects (4.8%), type 1, type 2, and type 4 as many 5 subjects (4.8%), type 1 and type 3 were 4 subjects (3.8%), type 2 and type 4 were 2 subjects (1.9%). Apart from that, there are several conditions such as: deep bite, median line shift, and multiple diastema which is not included in the Dewey modification classification, namely as much as 3 subjects (2.9%). Case multitype What happens to mentally retarded children is that most likely occur during the dentition period. Malocclusion involving several types of deformity (multitype) often occurs in children with mixed dentition (6-9 years), frequently encountered malocclusion problems include anterior crossbite, ectopic eruption of permanent incisors, posterior crossbite, open bite associated with bad oral habits, and developmental anomalies (ankylosis , tooth supernumerary, and missing teeth. [22]

Multitype cases or combinations of several types of malocclusion found in research can be explained through research [23] which states that children with intellectual disabilities often experience multiple oral conditions due to the complexity of the limitations they have. In

mentally retarded children, skeletal growth is often disrupted due to genetic abnormalities which can cause an imbalance in the jaw relationship, which can be exacerbated by orofacial muscle dysfunction. In addition, bad oral habits, such as mouth breathing or uncontrolled tongue pressure, can increase the risk of multitype malocclusion. [23] This has similarities with research [26], which states that impaired motor control and oral function in children with intellectual disabilities contribute greatly to the complexity of malocclusion. These multitype malocclusion cases also often require a comprehensive orthodontic therapy approach due to the involvement of many etiological factors. [26]

Class III Angle malocclusion classification data for 9 subjects (8.6%), obtained modified Dewey data in the form of monotype. The greatest frequency of Dewey modified Angle class III malocclusion in type 1 was 4 subjects (3.8%) and type 2 was 4 subjects (3.8%), followed by subdivision with 1 subject (1.0%). Most of the Angle class III cases occurred in children with moderate to severe intellectual disability, 6 samples (66%) who probably had great difficulty maintaining the health of their oral cavity due to their lower IQ and some of the mentally retarded children in this category show the presence of a longer face. This is similar to research [27] which was carried out on 383 subjects, with the largest results of Dewey modified Angle class III malocclusion in type 1 as many as 6 subjects (1.57%) and type 2 as many as 6 subjects (1.57%).[27] Malocclusion in the mentally retarded also occurs in Fragile X syndrome, Fragile X syndrome The majority are people with moderate to severe mental retardation. [5] Fragile X syndrome is a genetic disorder that causes a longer face, high palate, and macroglossia. This condition is often continuous in cases of malocclusion, such as mandibular prognathism (class III) accompanied by supernumerary (additional) teeth and impacted teeth. [5] Several studies also state that mentally retarded people can also suffer from class III malocclusion cases, this result is in line with research by [28], found that children with special needs classified as mentally retarded had a fairly high prevalence of malocclusion, with 46.7% belonging to the moderate malocclusion category. [29] This is in accordance with the characteristics of mentally retarded people who have a high risk of malocclusion due to limitations in caring for themselves so that they have difficulty maintaining oral hygiene. [4]

5. Conclusion

Based on the results of research conducted on mentally retarded children in five special schools in Jember Regency from October 2024 to November 2024, with a total of 105 children as subjects, it was concluded that 72.4% of mentally retarded children had Angle malocclusion, with the highest prevalence in Class I at 59.0 %. Frequency results monotype most commonly found in Angle class I modification Dewey classification in type 1 amounting to 17.1% and frequency data with multitype The largest angle classification of Dewey class I modification in type 1 and type 2 was 13.3%. These findings suggest that malocclusion is common in children with intellectual disabilities.

6. Research limitations

This research was only conducted on mentally retarded students in Jember Regency SLB, so the results may not represent the entire mentally retarded population in other regions.

Some mentally retarded students have communication difficulties, so they cannot convey complaints or respond well during examinations. This makes the data collection process difficult.

Some mentally retarded children are uncooperative during examination, such as having difficulty opening their mouths And stay calm.

7. Suggestions

If possible, examination of malocclusion in mentally retarded children can provide more accurate results.

Further studies are needed to understand more deeply the relationship between genetic factors, environment, and neuromuscular disorders with malocclusion in children with intellectual disabilities.

References

[1] Faisah, S. N., Siregar, M. A., Firanda, Nandita, I., Mujahadah, Auliyah, A., Musdalifa, & Samsuddin, A. fFtrah. (2023). Difficulties of Mentally Impaired Special Needs Sufferers in Learning to Recognize Numbers at SLB Bhakti Pertiwi Samarinda. Proceedings of the National Seminar on Mathematics Education, Mulawarman University, 3, 34–41.

[2] Andriani, O., Soraya, A. N., Sari, N., & Gunawan, A. (2024). Parental Involvement in Education Services for Children with Special Needs. *BIBLIOGRAPHY: Journal of Language and Education*, *4*(2), 31–41. https://doi.org/10.37216/badaa.v6i1.1413.

[3] Farani, W., & Abdillah, M. I. (2021). *Prevalence of Malocclusion in Patients Aged 9-11 Years at SD IT Insan Utama Yogyakarta*. *10*(1), 26–31. https://doi.org/10.18196/di.v10i1.7534.

[4] Izzati, N. N., Wibowo, D., Adhani, R., Setyawardhana, R. H. D., & Azizah, A. (2023). The Relationship between the Severity of Caries and the Incidence of Malocclusion in Elementary School Children. *Dentin*, *7*(3), 114–119. https://doi.org/10.20527/dentin.v7i3.10740.

[5] Novawaty, E., Puspitasari, Y., & Bachtiar, W. N. (2023). The Relationship between Malocclusion Severity and Quality of Life for Dental Faculty Students. *E-GiGi*, *12*(1), 55–59. https://doi.org/10.35790/eg.v12i1.48373.

[6] Amaral, C. O. F. Do, Silva, N. S., Guedes, A., Amaral, M. O. F. Do, Pizi, E. C. G., & Straioto, F. G. (2022). Fragile X Syndrome: Medical Considerations and Stomatological Aspects for Dental Treatment. *Asian Journal of Applied Sciences*, *10*(4). https://doi.org/10.24203/ajas.v10i4.7020.

[7] Vasconcelos, G., Stenehjem, J. S., Axelsson, S., & Saeves, R. (2022). Craniofacial and dentoalveolar morphology in individuals with Prader–Willi syndrome: a case-control study. *Orphanet Journal of Rare Diseases*, *17*(1), 1–11. https://doi.org/10.1186/s13023-022-02222-y.

[8] Ayu, K. V., Budijanana, I. D. G., Hidajah, N., & Walianto, S. (2023). Correlation of Mouth Breathing Habits to Dental Malocclusions. *Interdental Journal of Dentistry (IJKG)*, *19*(1), 17–21. https://doi.org/10.46862/interdental.v19i1.6318.

[9] Vijayalakshmi, K. (2020). Textbook of Orthodontics. 1st ed. CBS Publishers & Distributors. New Delhi.

[10] Sarvas, E., Webb, J., Landrigan-Ossar, M., & Yin, L. (2024). Oral health care for children and youth with developmental disabilities: Clinical report. *Pediatrics.* https://doi.org/10.1542/peds.2024-067603.

[11] Hanifah W, Laviana A, Zenab NRY. (2022). Facial Index Value Based on Angle Malocclusion Classification in the Deuteromalay Sub Race. *Padjadjaran J Dent Res Students*. 2022;6(2):104. https://doi.org/10.24198/pjdrs.v6i2.32426.

[12] *Koskela, A., Neittaanmäki, A., Rönnberg, K., Palotie, A., Ripatti, S., & Palotie, T. (2021). The relation of severe malocclusion to patients' mental and behavioral disorders, growth, and speech problems. European Journal of Orthodontics, 43(2), 159–164.* https://doi.org/10.1093/ejo/cjaa028.

[13] Daniati, N., Apriliani, D. R., & Anang. (2022). Media Question Card Towards Knowledge of Dental and Oral Health in Elementary School Age Mentally Retarded Children. *The Incisor (Indonesian Journal of Care's in Oral Health)*, *6*(2), 269–280. https://doi.org/10.37160/theincisor.v6i2.27.

[14] Anindita, R., et al. (2024). *Prevalence of malocclusion based on Angle's classification in children aged 9–12 years.* Journal of Pediatric Dentistry, 12(3), 45–55.
[15] Sayuti, E., Latif, D. S., Aziz, M., & Sasmita, I. S. (2021). Prevalence of Malocclusion and Orthodontic Treatment Need in Children with Autism. Journal of International Dental and Medical Research, 14(2), 856–690. https://web-s-ebscohost-com.ezproxy.uwc.ac.za/ehost/pdfviewer/pdfviewer?vid=1&sid=e527e35d-855a-42e7-8e9f-e65208c73bad%40redis.
[16] Bhatt, R., Chandna, A. K., Bhandari, R., Bhattacharya, P., Singh, S., & Gupta, A. (2023). Assessment of dental malocclusion and softtissue features among children with special needs in the Western UP region: A crosssectional study. *Journal of Indian Society of Pedodontics and Preventive Dentistry*, *41*(2), 118–125. https://doi.org/10.4103/jisppd.jisppd_186_23.
[17] Abdalla, E., & Mohamed, H. (2022). Oral health status of children with disabilities: A review of literature. *Acta Scientific Dental Sciences*, *6*(11), 25–31. https://actascientific.com/ASDS/pdf/ASDS-06-1486.pdf. https://doi.org/10.31080/ASDS.2022.06.1486.
[18] Brzovic Rajic, V., Modric, V. E., Ivanisevic Malcic, A., Gorseta, K., Karlovic, Z., & Verzak, Z. (2021). Molar Incisor Hypomineralization in Children with Intellectual Disabilities. *Dentistry Journal, 9*(2), 21. https://doi.org/10.3390/dj9020021.
[19] Hafizi, I., & Fadzillah, I. (2021). Edge to Edge Bite Correction of Canines with Labial Arch Combination of Bayonet Band and Elastic Rubber Band on Removable Orthodontic Appliances. *JIKG (Journal of Dental Sciences)*, 4(2), 58–63. ISSN 2579–7239 (Printed), ISSN 2580-0523 (Online).
[20] Balina, S., Karri, T., Indugu, V., Gade, R. R., Vineesha, C. M., & Likhita, C. (2023). Prevalence and distribution of malocclusion using Dewey's modification in Coastal Andhra Pradesh, India: A cross-sectional study. *Journal of International Oral Health*, *15*(4), 396–401. https://doi.org/10.7759/cureus.42965.
[21] Kumari, M., Anand, K., Sah, M., Jha, P. C., & Kumari, A. (2024). Cross-sectional study on the prevalence of malocclusions and orthodontic treatment needs in pediatric patients with special healthcare needs. *International Journal of Pharmaceutical and Clinical Research*, *16*(5), 2283–2290. http://www.ijpcr.com
[22] McDonald, R. E., Avery, D. R., Dean, J. A., Jones, J. E., & Vinson, L. A. (2022). *McDonald and Avery's Dentistry for the Child and Adolescent* (11th ed.). Elsevier.
[23] Mehta, V., Tripathy, S., Merchant, Y., Mathur, A., Negi, S., Shamim, M. A., Abullais, S. S., Al-Qarni, M. A., & Karobari, M. I. (2024). Oral health status of children with intellectual and developmental disabilities in India: a systematic review and meta-analysis. *BMC Pediatrics*, *24*(1). https://doi.org/10.1186/s12887-024-05242-8.
[24] Okolo, C. C., Adeyemo, Y. I., Malami, A. B., & Oredugba, F. A. (2024). Oral Health of Children and Youth with Special Healthcare Needs in Kano, Nigeria. Nigerian Journal of Basic and Clinical Sciences, 21(1), 38–42. https://doi.org/10.4103/njbcs.njbcs_54_23.
[25] Gupta, P. V., & Hegde, A. M. (2015). *Pediatric Dentistry for Special Child*. New Delhi: Jaypee Brothers Medical Publishers. ISBN: 978-93-5250-193-9.
[26] Hosseini, A., & Sohanian, S. (2020). Oromandibular Limb Hypogenesis Syndrome Type IB as a Rare Clinical Variant: A Case Report and Review of Literature. *Middle East Journal of Rehabilitation and Health Studies*. https://doi.org/10.5812/mejrh.97231v.
[27] Ranjan, P., Singh, S. J., Raye, T., & Rayee, T. (2024). Student's Journal of Health Research Africa. *Student's Journal of Health Research Africa*, *5*(3).
[28] Pawinru, A. S., Alimuddin, N. R., & Susilowati. (2024). Overview severity of malocclusion in children with special needs in SLB Negeri 1 Makassar. *Makassar Dental Journal*, *13*(2), 1–14.
[29] Shoumi, F., Isnanto, & Mahirawatie, I. C. (2023). The relationship between oral hygiene and the occurrence of gingivitis in mentally retarded students at SLB Karya Bhakti Surabaya. *E-Indonesian Journal of Health and Medical*, *3*(2), 1–9. http://ijohm.rcipublisher.org/index.php/ijohm.