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The effectiveness of myobrace on the treatment of malocclusion and bad habits in children: A systematic review

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Abstract---Background: Malocclusion is caused by several factors such as sticking out the tongue, biting the lips, sucking the thumb

and biting nails, and breathing through the mouth. This bad habit results in malocclusion which can reduce craniofacial development of orthodontic problems in children. One of the treatments for malocclusion in children with orthodontic problems is the use of myofunctional appliances. Myofunctional devices can properly restore orofacial muscles to normal anatomy. One way to overcome this bad habit is to use myobrace. Myobrace is a three-stage device system specifically designed to treat malocclusion and correct bad habits in children. Objective: To search the literature study on the effectiveness of miobrace in early correction of malocclusion development and in overcoming bad habits in children. Method: Data collection was carried out by searching literature on article search sites, namely Pubmed, Cochrane, Wiley, Google Scholar and Science Direct published from 2016 to 2021. The search was carried out from March to April 2021. Systematic exit using the keyword Malocclusion, Myobrace, Orofacial Myofunctional Therapy. Results: After eliminating the articles, the title and abstract of each article were analyzed in 52 articles which were excluded from 44 articles. The text of the journal articles that are complete and meet the requirements is 10 articles. Conclusion: Myobrace appliance can be used as an alternative treatment of malocclusion in children, Myobrace system improves children's systemic health by correcting bad habits that prevent the need for orthodontic treatment in the future.

Keywords---*Malocclusion, Myobrace, Orofacial Myofunctional Therapy.*

Introduction

The American Academy of Orthodontists (AAO) recommends that children undergo an orthodontic examination at the age of 7 years to determine the possibility of the child having malocclusion problems and facilitate further treatment. In children who have orthodontic problems, one of the treatments is myofunctional therapy. The goal of myofunctional therapy is to strengthen the muscles needed for breathing, chewing and swallowing.[1] Normal dentofacial development depends on the normal function of the muscles around the mouth. The balance between the muscles of the lips, cheeks from the outside of the dental arch and the tongue from the inside needs to be maintained. The imbalance of the three orofacial muscles will affect the development of dentofacial structures. Early detection of orofacial muscle imbalance in children is very necessary as an effort to prevent malocclusion.[2,3]

Myobrace is an intra-oral appliance system used in orthodontic interception. The mechanism is a combination of preventive and miofunctional therapy. This tool aims to straighten teeth and improve jaw development to prevent jaw backwards. In addition, it allows children to breathe through the nose and rest the tongue in the correct position. Early diagnosis and treatment of orofacial myofunctional disorders minimizes the occurrence of malocclusion and reduces the likelihood of relapse after orthodontic treatment. Myofunctional is claimed to be able to train the orofacial muscles; thereby correcting the malocclusion.[4,5]

The goals of myobrace treatment are to assist the patient in reaching their full developmental potential and establish nasal breathing from mouth breathing, correctly position the tongue in the upper jaw, swallow properly, lips fused unless eating or speaking, healthy eating habits, correct alignment of teeth and jaw, uninhibited craniofacial development, no extraction or retention, minimal or no use of wires and optimal health is achieved. [6]

Materials and Methods

Data source

Data collection was carried out by searching literature on article search sites, namely google search, Pubmed, Cochrane, Wiley, Google Scholar and Science direct which were published from 2016 to 2021, the search was carried out in March - April 2021. Data search was carried out systematically using keywords Malocclusion, Myobrace, Oral Myofunctional Therapy

Research Criteria

A. **Inclusion criteria**

1. Published articles from 2016-2021
2. Articles in English
3. Published scientific articles available online
4. Articles researching malocclusion and using the Myobrace

B. **Exclusion criteria**

1. Articles included in systematic reviews, literature reviews, case reports, and editorials
2. Articles that cannot be accessed for free

Data collection

The data that will be used in this research is secondary data. The data was obtained from the articles searched in the article database which would then be reviewed according to the research criteria set by the researcher.

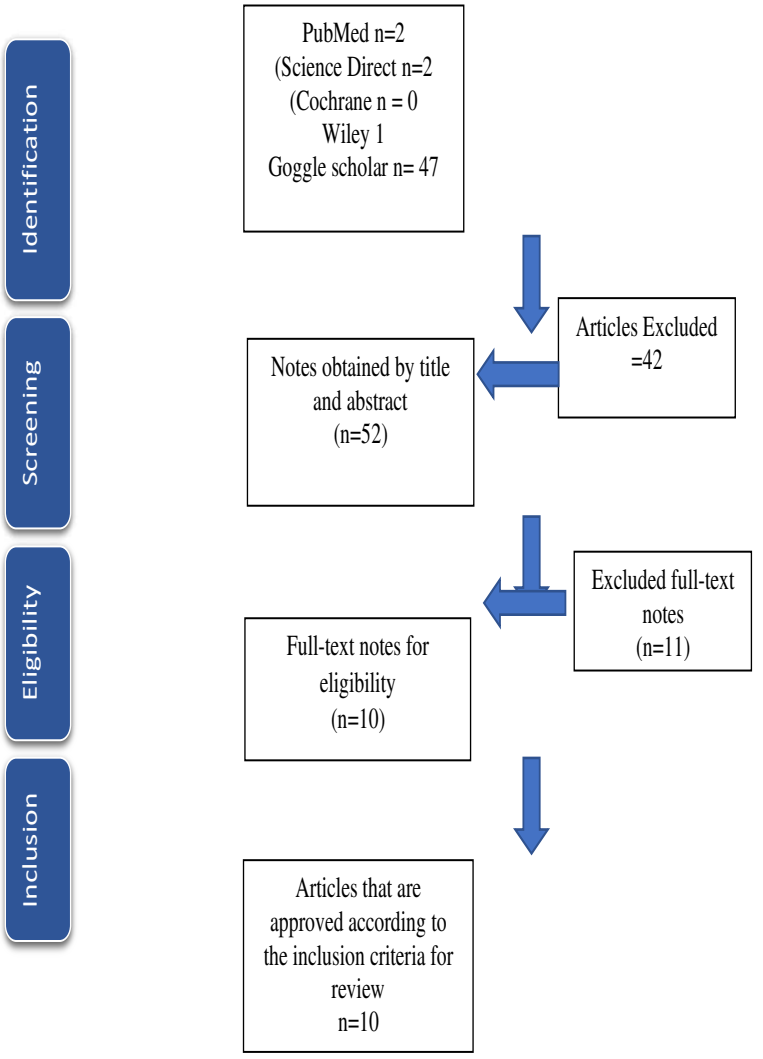

Figure 1. Diagram showing the selection of Articles for review

Table 1. Study descriptive data included

No.	Writer / Year	title	Aim	Method	Conclusion
1.	Claire Van Dick, Aline dekeyser, Eline VantrickEtc. (2016)	The effect of Myofunctional orofacial treatment in children with anterior open bite and tongue dysfunction: a pilot study.	This study aimsto know OMT effect (Orofacial Myofunctional Therapy on tongue behavior with AOB and swallowing patterns in children child.	Method Quantitative with analysis covariance (ANCOVA)	OMT (Orofacial Myofunctional Therapy) can positively influence tongue behaviorin children. OMT significantlychanges the force of tongue elevation, the posture of thetongue at rest, and the position of the tongue when swallowing solid food.
2.	Kee-sang Hong(2016)	Oropharyngeal Airway Dimensional Changes afterTreatment with Trainer for kids(T4K) In class IIretrognatic children	Purpose of research this is forconfirm whether.	Qualitative Method Studies	In cases of Class II malocclusion where the teeth The maxillary protrusive anterior and mandibular have been retretized, using Myobrace the mandibular position can moved forward using the anterior teethsupport. Thereforeget corrective effect from axial excess to the maxillary labial angle of the anterior teeth to the palatal region, therefore expansionof the airway can be achieved.
3.	Kosmas N Chrysopoulos (2017)	interception OfMalocclusion in the mixed dentition with prefabricated applications andorofacial myofunctionaltherapy	Myobrace (Trainer ForKids T4KTM MyofunctionaRes earch Co.,Australia)), which is a correction toolmalocclusion , can help treatment OSAS for kidsby verifyingnot only treatment malocclusion but also expansion of theupper airway.	Qualitative Method	
4.	Isha Agarwall et al3 (2019)	Myobraces: Say No to Traditional Braces	The purpose of this researchis for Describea tool myobrace, specifically characteristics tool structure it along with mechanism work.	Qualitative Method	The Myobrace™ system caters toincreasing public pressure on non-invasive, preventive and more stable treatments byaddressing the underlying causesfacial development of children. Myobraceis a three-stage treatment systemspecifically designed for repairbad oral habits while treating the maxillaand problemsmandibular development in children.
5.	Hisham Mohammed, EminaČirgić, Mumen Z. Rizk, and Vaska Vandevka Radun Ovic (2019)	Effectiveness of prefabricated myofunctional appliances in the Class II treatment division I Malocclusion : a Systematic Review	Goalto seeeffectiveness this PMA toolfor correct malocclusion Class II division 1 .	Qualitative Method	In this study it was shown that prefabricated myofunctional equipment (Myobraces, trainer for kids) was generally effective in treatingClass II division 1 malocclusions.

6.	Harun Ahmad (2021)	Management ofMalocclusion in Children UsingMyobraceApplia nce: A Systematic Review	The purpose ofsystematic review Which done is forFind andexplore systemthe manager us malocclusion Children and Mywith use Tool Myobrace.	Qualitative Method	Myobrace device can be used as an alternative treatment of malocclusion inchildren, especially to correct class IImalocclusion and class III malocclusion (maxillary mandibular prognathic and retrognathic). This tool is also capable of correcting overbite, overjet, crowding of upper and lower anterior teeth, sagittalmolar relationship, lip seal, facial asymmetry.
7.	Paola da Cunha Busquet1, Desireede Jesus portelinha2, Monica Lage da Costa1# and Viviane de Andrade Cancio de Paula2* (2021)	How the myobrace appliance works : advantages and disadvantages	Aim :for serveresearch base (Medline, on Comyobrace device.	Method qualitative method with a survey conducted inliterature review cranes, Embase, Pubmed, Lilacs and BBO) between 2019 and 2020, focusing on randomized clinical studies, prospective non randomized longitudinal studies, reviews systematic and metaanalysis, clinical cases using Myobrace.	Results: It was concluded that the treatment orthodontics cannot be considered as contributing factors for development of temporomandibular disorders.

8.	Francesco Mozzanica, Nicole pizzorni Etc (2020)	Impact of Oral Myofunctional Therapy on orofacial Myofunctional Status and Tongue Strength in Patients with Tongue Thrust	For evaluateOrofacial effect Myofunctional Therapy through instrument which hasvalidated andexplore si danevaluateefficacy a onmaintenanceteeth.	Qualitative Methods in Evaluating Orofacial MyofunctionalTherapyby usingorofacial Myofunctional Evaluation with Scores(OMES), protocolvalidated that developed for disturbance assessment orofacial myofunctional, and Iowa Oral Performance Instruments to measureThe peak isometric pressure is given by anterior and posterioron the tongue.	Results: OMT which done couldimprove orofacial mobility and tonguestrength in patients. The study resultsshowed a significant change in the OMESscore wasdemonstrated after performing OMT, but there was no significant difference between patients with intermediate teeth. and mixed dentition obtained in the pre- and posttreatment conditions as indicated by the OMES score. Similarly, a significant increase in peak isometric tongue pressure in the anterior and posterior parts of thetongue was demonstrated after OMT in one group. There was no differencebetween the two groups in the conditions before and after treatment as shown in theIOPI score
9.	Robyn Merkel Walsh (2020)	orofacial Myofunctional therapy with children ages 0-4 and individuals with special needs	The purpose of study theis fordefinen variations your terminology	Qualitative Method by conducting a review library againstprevious research.	Medications used in the therapy oforofacial Myofunctional Disorder to stimulate oral motor responses depend on age and cognitive status. OMD should ofcourse being treated in infants, youngchildren and individuals with special needs according to specialist child feeding methods. Myofunctional Orofacial Therapy
10.	Kizi G. Ventura I, 20 Barata R, Riba D, Castano Seiquer A.(2017)	Early Treatment Of a Th III malocclusion is to kn with myobrace Myofunc clinical case system. e-goal for classthe effectalto the patient the children whodiagnosed with anterior crossbite		Qualitative Method	Demonstrated the effectiveness of using myofunctional in early stages at ayoung age, to avoid treatments such as maxillofacial surgery in the elderly

Discussion

From research conducted by Dick, et al (2016) this study aims to determine the effect of OMT (Orofacial Myofunctional Therapy on tongue behavior with AOB and swallowing patterns in children using the Quantitative Method with Covariance Analysis (ANCOVA) explaining the results of the OMT study.MT can positively influence tongue behavior in children. OMT significantly changed tongue elevation strength, tongue posture at rest, and tongue position when swallowing solid food.

Subsequent research was carried out by Isha Agarwall et al, entitled Myobraces: Say No to Traditional Braces which aims to describe the myobrace apparatus, in particular the structural characteristics of the device and its working mechanism. By using quantitative methods,The Myobrace™ system caters to increasing public pressure on non-invasive, preventive and more stable treatments by addressing causes that hinder the facial development of children. Myobrace is a three stage equipment system specially designed to correct poor oral habits while treating maxillary and mandibular developmental problems in children.

Further research by Harun Achmad (2021) with the title Management of Malocclusion in Children Using Myobrace Appliance: A Systematic Review which aims to find and explore the management of malocclusion in children using the Myobrace tool. Myobrace device can be used as an alternative treatment of malocclusion in children, especially to correct class II malocclusion and class III malocclusion (maxillary mandibular prognathic and retrognathic). This tool is also capable of correcting overbite, overjet, crowding of upper and lower anterior teeth, sagittal molar relationship, lip seal, facial asymmetry. Furthermore, research conducted by Paola da Cunha et al (2021) entitled How the myobrace appliance works: advantages and disadvantages with the aim of presenting a literature review about myobrace devices. It was concluded that orthodontic treatment cannot be considered a contributing factor to the development of temporomandibular disorders.

Myobrace®, in addition to guiding teeth and aiding proper alignment, increases the effectiveness of orofacial myofunctional therapy: Labial and buccal guards: prevents lip interposition. The Myobrace® apparatus is a prefabricated functional apparatus with tooth positioning and myofunctional training characteristics, which is used to correct malocclusions in developing children, in conjunction with myofunctional therapy-via Myobrace.[8]

Conclusion

Myobrace device can be used as an alternative treatment for mild and moderate malocclusion in children, it is also capable of correcting overbite, overjet, crowding of upper and lower anterior teeth, sagittal molar relationship, lip seal, facial asymmetry. The goals of treatment using myobrace are: Restoring nasal breathing from mouth breathing, correcting the correct tongue position, correcting correct swallowing, correcting the alignment of the teeth and jaw to the correct position, no retention or retention, minimal or no use of braces, achieving health optimal, unimpeded craniofacial development. The use of

Myobrace for a minimum of two hours every day and a maximum of overnight, aims to provide adequate expansion and strength of the jaw arch to align the anterior teeth.

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