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REVIEW

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Multidisciplinary management points in early childhood treatment

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Abstract

In recent years, the concept of early intervention in children has gained significant popularity and attention within the healthcare community. The necessity of implementing early intervention strategies and effectively managing malocclusion in children is often a topic of debate among professionals. Furthermore, it is crucial to recognize that various multidisciplinary knowledge areas, including dentistry, pediatrics and psychology, must be taken into account during the treatment process. Currently, there is a lack of a comprehensive action plan that can effectively guide these important considerations. Therefore, this article aims to highlight the key monitoring and management points that are related to the multidisciplinary aspects involved in early intervention. It seeks to summarize the various action plans that should be considered for early intervention, ultimately providing a more thorough and comprehensive guideline for clinical orthodontists to follow in their practice.

Keywords

Early treatment; Dentistry; Skeletal; Decayed tooth; Tongue position; Respiratory; Musculoskeletal; Psychological

1. Overview of early correction

With the improvement of people's living standards, national health awareness is gradually growing, and parents' attention to children's oral health is also gradually increasing. In recent years, the early treatment of children's malocclusion has become a hot topic in the oral field, but a consensus on the standardized treatment of early childhood correction has not yet been reached [1]. Children are in the growth and development stage, which requires the relevant practitioners to have strong thinking abilities and the awareness of multidisciplinary monitoring to maintain professionalism and ethical standards of early correction. As orthodontic specialists, it is essential to possess a foundational understanding of early intervention strategies and organize and unify all action plans about early pediatric treatment from a multidisciplinary perspective. When addressing pediatric patients, a comprehensive assessment encompassing oral health, postural alignment, and psychological status is necessary to formulate standardized and reasonable treatment plans. This review focused on the multidisciplinary monitoring and management in early intervention, aiming to consolidate various action plans for consideration in this context. The goal is to provide clinical orthodontic specialists with more comprehensive guidelines.

Early treatment of malocclusion deformities includes addressing tooth alignment, early preventive measures, and orthodontic interventions to achieve functional and aesthetic harmony in patients with craniofacial discrepancies. This approach encompasses the management of oral function, occlusion, maxillofacial growth and overall health development during the critical stages of growth and development [1]. Key considerations in pediatric early intervention include timely correction of adverse tongue, oral, and swallowing habits, dental space management, control of genetic craniofacial anomalies, maintenance of children's nutrition and health, early treatment of respiratory diseases in children and correction of abnormal body and head postures.

According to reports, if early intervention is not implemented, patients with severe maxillary protrusion are at a higher risk of sustaining anterior dental injuries, which adversely affect their physical and mental well-being [2]. Patients with severe mandibular retrognathia are prone to developing obstructive sleep apnea, attention deficit hyperactivity disorder (ADHD) and neurocognitive issues [3]. If deep overbite and open bite are not corrected promptly, these conditions could have significant adverse effects on the temporomandibular joint of the child over time [4]. In children with excessive protrusion, a lack of prompt monitoring and correction can negatively affect psychological well-being and language expression ability [5]. Variations in the size, shape and number of teeth in a child's oral cavity can affect occlusion and reduce chewing efficiency [6]. Tooth misalignment also increases the risk of food debris accumulation and dental calculus formation, potentially leading to dental caries and periodontal disease [7]. Failure to intervene in prolonged thumb-sucking habits may alter a child's tongue position and swallowing pattern, leading to dental arch constriction, anterior protrusion of the upper front teeth or open bite malocclusions [8]. Early intervention

is beneficial for preventing and intercepting the severity of malocclusion, addressing both aesthetic and functional issues. Early intervention ensures a child's growth, development and self-confidence, paving the way for a bright and confident future [9, 10].

2. Common methods of early orthodontic treatment

2.1 Early intervention for Class II malocclusion

Class II malocclusion is characterized by maxillary protrusion and mandibular retrognathia, with a prevalence rate of up to 29% [11]. A recent study indicated that early orthodontic treatment for Class II malocclusion can significantly improve overjet and occlusion, with most patients maintaining long-term stability [12]. For children with a deep overbite, narrow dental arch, maxillary protrusion or mandibular retrusion during the early and middle stages of mixed dentition, it is necessary to block the interfering factors of removing teeth and muscle imbalances, coordinate the width of the dental arch, guide the normal growth and development of the jaw, pay attention to airway problems, break bad oral habits and not advance the jaw prematurely. Early growth control is implemented as children enter late mixed dentition and early permanent dentition stages. This is achieved using inclined planes, expansion devices, twin blocks, and headgear to induce occlusion and control three-dimensional positioning. Early correction of excessive protrusion of children's anterior teeth can also prevent an increase in trauma incidence. Reports indicate that early treatment of Class II anterior protrusion can reduce the prevalence of anterior tooth trauma from 30% to 19% [13]. The Twin Block appliance can improve the relative position of the mandibular condyle, while headgear reduces overjet and Angle between Points A, N, and B (ANB angle) [14]. Therefore, early intervention and treatment are highly recommended for severe Class II malocclusion. Typically, it is recommended that children with Class II malocclusion begin orthodontic treatment during the peak growth period of cervical vertebrae Cervical Spine Stage3 (CS3 stage) to effectively correct the clinically relevant skeletal impacts associated with Class II malocclusion [15].

2.2 Early intervention for Class III malocclusion

Class III malocclusion is characterized by maxillary retrusion and/or mandibular protrusion, affecting approximately 0% to 26% of the population [16]. However, early treatment of Class III malocclusion often presents challenges, including management difficulties and lower predictability. To optimize the intervention timing during skeletal growth, it is generally recommended that early treatment occurs before the age of 10 [17]. Various orthodontic appliances are used clinically, including facemasks, chin cups and the Frankel-III. The primary advantage of early treatment for Class III malocclusion is the reduction in the need for surgical intervention. Throughout treatment, children should undergo continuous monitoring. For children with simple malocclusion, interventions like tongue springs and the 2 × 4 technique can help to avoid occlusal trauma and promote proper jaw development. Functional appliances, such as the Frankel-III, can correct malocclusion, adjust misaligned positions in patients with functional malocclusion and remedy harmful habits. Children with skeletal issues should undergo an evaluation of genetic factors. Expanding devices in conjunction with facemask therapy is recommended to promote the maxilla's development.

Furthermore, addressing airway concerns, correcting harmful habits and incorporating myofunctional training are also essential, with regular prognosis assessments. A previous study indicates that the Frankel-III appliance repositions the oral and maxillofacial muscles by tilting the upper front teeth upward with the lips and the lower front teeth downward with the tongue. This adjustment increases the length of the maxillary dental arch and encourages the natural retraction of the mandible, promoting normal development of the dental arch and the chin [18]. Early treatment with facemasks demonstrates positive improvements in both skeletal and dental changes in the short term; however, evidence of long-term benefits remains limited [19]. It is important to note that the combination of maxillary expanders and forward-traction headgear is relatively effective for early treatment of Class III malocclusion in the mixed dentition stage. However, using reverse-pull facemasks may potentially result in an increased steepness of the mandibular plane angle [20]. The early interceptive treatment of Class III malocclusion aims to facilitate potential improvements in growth and development for rapid and significant results. Reports indicate that a shorter and broader maxilla may serve as a triggering factor for relapse and treatment failure in patients with Class III malocclusion [21]. Therefore, ongoing management and monitoring of affected children are necessary, with auxiliary methods such as dental arch analysis to predict relapse and timely intervention for maintaining normal jaw relations.

3. Multidisciplinary monitoring and management in the early correction process

3.1 Caries risk control and caries management

3.1.1 Etiology of dental caries in children

Children have a high incidence of dental caries caused by genetics, environment and diet. The global prevalence of caries among preschoolers is estimated at 65%, with a mean decayed, missing and filled surfaces (dmfs) score of 4.2 [22]. Caries is a disease that requires continuous management throughout the growth and development of children. The American Academy of Pediatrics (AAP) has recently updated several recommendations in a guidance document on "Maintaining and Improving Oral Health in Young Children" [23]. These recommendations emphasize a shift in caries management towards early intervention and preventive strategies, advocating for the collaboration of various healthcare professionals in oral health management. This highlights the necessity for orthodontic specialists to understand and actively participate in early intervention efforts

for childhood caries. Children undergoing early orthodontic treatment are generally more prone to dental decay due to the increased difficulty of maintaining oral hygiene with various orthodontic appliances. These appliances can induce changes in the oral environment, including increased plaque accumulation, colonization by Streptococcus mutans and higher levels of lactic acid bacteria, all of which contribute to the risk of dental caries [24, 25]. Some scholars have proposed integrating caries prevention and risk assessment concepts into caries diagnosis and treatment to address this. This includes implementing preventive measures and individualized, comprehensive treatment plans while using the Caries Risk Assessment Tool (CAT) to standardize clinical caries prevention and control [26].

3.1.2 Key aspects of caries monitoring and management

Caries lesions have been associated with malocclusion in children aged 7–10 years [27, 28], underscoring the need for careful monitoring of caries in children undergoing early orthodontic correction. Access to surgery and dental care may be challenging for pre-school children, highlighting the need for personalized and evidence-based care pathways to manage dental caries effectively at the individual level [29]. Some researchers utilize the salivary biomarker Proteinase 3 (PR3) as an effective tool for the early detection of dental caries and assessing caries risk in patients. The severity of caries can be determined through non-invasive and personalized biomarker molecular testing, demonstrating significant clinical value [30].

The application of topical fluoride and oral health education is significant for the early prevention of caries. When necessary, these strategies, in conjunction with regular check-ups and specialized care, constitute essential components of the management plan [31]. In clinical practice, emphasizing oral hygiene education for children is crucial to fostering good dietary habits and reducing plaque formation and accumulation. Regular follow-up visits are necessary to assess the child's oral hygiene maintenance and caries risk. This enables early caries detection and proactive intervention to promote the remineralization of the teeth. In addition to preventive measures, recent research highlights restorative treatments, such as fillings and extractions, to treat cases of advanced caries [29]. Preventing and early treating childhood cavities can effectively reduce the potential development of malocclusion [32]. For children preparing for early orthodontic treatment, it is essential to close deep fissures and treat active caries before initiating orthodontic therapy. The continuous inclusion of caries management in subsequent monitoring is also indispensable.

3.2 Periodontal health management

3.2.1 Etiology of periodontal disease in early correction

Although the prevalence of destructive periodontal disease is significantly lower in children than in adults, severe periodontitis can occur and may indicate systemic diseases. Early diagnosis is critical to maximizing the chances of successful treatment; therefore, incorporating periodontal examinations as an essential component of routine dental check-ups for children is crucial [33]. Research indicated a close relationship between malocclusion and periodontal disease [34]. Malocclusion contributes to more plaque accumulation, leading to more periodontal destruction. Adverse changes in the subgingival microbial community, including plaque formation, bleeding and increased probing depth (PD), have been found soon after appliance insertion [35]. A recent cross-sectional study showed that 50% of patients developed gingivitis within 6 months after orthodontic treatment [36]. Another study reported that the prevalence of gingival hyperplasia increased from 23.7% at the placement of fixed orthodontic appliances to 73.7% by the end of two years of treatment [37]. Chronic gingivitis is the most common periodontal infection in children and adolescents, and it is considered to be a preexisting stage of periodontitis [7]. The direct stimulation of the gums and potential harm from the effectiveness of oral hygiene practices significantly increase the occurrence of periodontal complications. Furthermore, researchers have proposed that hormonal changes during childhood and the continuous low-dose nickel produced by orthodontic appliances may also contribute to periodontal complications in orthodontic patients [38].

3.2.2 Main points of periodontal disease monitoring and management

The control of periodontal risk in early correction depends on the comprehensive evaluation of periodontal tissue status, appropriate program design, prudent treatment operation and reasonable oral hygiene maintenance. For children, timely removal of dental plaque and maintaining oral hygiene are essential to prevent gum inflammation. In the case of periodontal diseases, orthodontic correction should only proceed when inflammation is under control. The tooth root absorption should be lightly applied and closely monitored for traumatized teeth to eliminate occlusal trauma in time. Careful evaluation of periodontal health management before treatment is conducive to improving children's oral health level and medical quality [39]. Chairside oral hygiene instruction is the most prevalent method for cultivating motivation for oral hygiene among orthodontic patients. Managing periodontal disease in children undergoing early orthodontic treatment requires orthodontists' attention to clinical prevention and the comprehensive utilization of information reminders and behavioral corrections [36].

3.3 Eruption management

3.3.1 Abnormal causes occur

Tooth eruption is a key milestone in children's growth and development. Proper tooth eruption and craniofacial growth to form functional occlusion are essential for children's growth and development [40]. The emergence of teeth is a complex process closely associated with the differentiation

and development of dental tissues, bone formation, resorption in the alveolar bone, and remodeling of the periodontal ligament fibers [41]. Changes at any stage of tooth eruption can potentially lead to abnormalities, such as impacted teeth, delayed eruption of permanent teeth and misaligned eruption, which are common issues in children. Early targeted prevention and intervention are beneficial for ensuring the healthy development of children. Through a cross-sectional retrospective study, German scholars have found a close correlation between delayed eruption of permanent teeth, retention of deciduous teeth and dental caries in children [42]. This further emphasizes the importance of multidisciplinary monitoring. The latest research has found an association between single nucleotide polymorphisms in the gene encoding Cyclooxygenase-2 (COX2) and deciduous tooth retention, which may delay permanent tooth eruption [43]. It is important to note that systemic diseases, such as metabolic bone disorders, can also lead to abnormal tooth eruption in children [44]. This indicates that clinical orthodontists should pay special attention to differential diagnosis.

3.3.2 Main points of monitoring management

During the early correction process, monitoring the replacement situation is essential and timely measures should be implemented, such as gap management, removal of local obstacles and traction to assist eruption. Researchers are exploring using Three-Dimensional Printed (3D-printed) ribbon and ring space maintainers for diagnosis and treatment [45] and digital personalized printing traction devices for traction assistance [46]. Concisely, Xia *et al*. [47] found that the total effective rate of early intervention in a series of malocclusion malformations caused by abnormal eruption of permanent teeth was as high as 89.29%. Furthermore, Guo *et al*. [48] also emphasized that in cases involving multiple abnormal teeth, early removal, such as before the eruption of adjacent teeth, can significantly reduce follow-up treatment time. Clinical practitioners have proposed various treatment options for ectopically erupting permanent teeth, including elastic separators, copper wires, prefabricated space maintainers, custom appliances and extraction of primary molars [49]. Among these, custom appliances demonstrate significant advantages in correcting anterior crowding, the anteroposterior skeletal relationship and the positioning of permanent incisors [50]. Therefore, it is essential to pay attention to indications during the early orthodontic process and intervene appropriately, ensuring the correct and complete eruption of permanent teeth in children and improving arch size and dental alignment.

3.4 Respiratory management

3.4.1 Causes of oral respiration

Oral respiration occurs when airflow through the mouth exceeds a certain proportion. Pathological conditions, such as nasal and pharyngeal diseases, and chronic factors, such as bad habits, contribute to this phenomenon. Mouth breathing is classified into three types: anatomical mouth breathing caused by dental and skeletal developmental abnormalities, obstructive mouth breathing resulting from nasopharyngeal diseases and chronic mouth breathing [51]. Airway stenosis caused by hypertrophy of adenoids and tonsils can lead children to exhibit open-mouth breathing, snoring and even apnea. If oral breathing persists due to airway obstruction for an extended period, neuromuscular reflex may develop, making it easier for the habit to persist even after the obstruction is resolved [52]. Chronic mouth breathing can lead to low tongue posture, resulting in narrow upper dental arches, a retruded lower jaw and changes in head posture. In clinical practice, respiratory issues are often identified alongside dental problems. Currently, there is no standard diagnostic method for oral respiration. Pereira CB *et al*. [53] have summarized several commonly used diagnostic methods, such as mirror test and water test, and explored the use of artificial intelligence pattern recognition and thermal imaging technology for diagnosis. However, these methods require further development. Long-term chronic oral respiration often leads to a low tongue posture, causing narrowing of the upper dental arch, mandibular retraction, changes in head posture and other complications.

The prevalence of malocclusion is high in children who breathe through their mouths. Mild tonsillar hypertrophy is significantly associated with malocclusion, Class II relationships and increased coverage in mouth breathers [54]. Similarly, there is a correlation between skeletal malocclusion and the incidence of mouth breathing [55]. Children who seek orthodontic treatment due to mouth breathing typically exhibit a high palatal vault and lowered tongue posture, often accompanied by a retruded lower jaw. Regarding soft tissue morphology, these children commonly present with more prominent upper lips, which is also gender-related [56]. Recent studies have shown that mouth breathing significantly impacts the anterior part of the mandible (Pog) [57]. Therefore, it is understood that mouth breathing may affect the proportion of lateral and vertical facial development, significantly impacting dental alignment. As a result, parents often seek orthodontic care due to aesthetic concerns or dental issues. This underscores the necessity for orthodontic specialists to monitor further and manage the respiratory problems in these children.

3.4.2 Main points of respiratory monitoring management

The younger the patient, the greater the likelihood of pathological mouth breathing; this condition typically peaks at ages 5 and 10. Clinical attention should be directed towards adenoid and tonsil hypertrophy. It has been reported that the proportion of bony class II in children with adenoid hypertrophy has significantly increased by 16%, and the proportion of bony class III in children with tonsil hypertrophy has increased substantially by 14% [58]. Therefore, paying attention to facial abnormalities in children and monitoring respiratory problems before early treatment is crucial. It is worth noting that oral breathing may also indicate sleep apnea syndrome (OSAHS) in children. Such children have a significantly higher incidence of daytime sleepiness, which is believed to be linked with craniofacial morphology and breathing patterns [59]. Addi-

tionally, children exhibiting craniocervical hyperextension and kyphosis should also be closely monitored for mouth-breathing issues [60].

The assessment of the anteroposterior position of the maxilla and mandible, the inclination of the occlusal and mandibular planes, anterior positioning and the measurement of the nasopharyngeal airway gap are crucial for diagnosing mouth breathing and obstructive sleep disturbances. Children with mouth breathing typically exhibit larger Sella-Nasion-A Point Angle (SNA angle), facial height and mandibular plane angles [61, 62]. Children who breathe through their mouths exhibit different airway dimensions than nasal breathers. In adolescents, these variances include facial developmental structures and the position of the tongue bone [63].

In the early treatment process, dental appliances such as maxillary rapid diffuser, Twin Block functional appliance, anterior tractor and muscle function trainer were used to improve functional results by reducing the apnea-hypopnea index [64]. Rapid maxillary expansion is the orthodontic treatment of choice for children with OSAHS cases, but it is not always possible to resolve this problem with orthodontic treatment [65]. Rapid maxillary arch expansion, adenoid tonsillectomy, Twin Block guiding the mandible forward, continuous positive airway pressure ventilation and comprehensive orthodontic therapy are used in clinical practice to manage children's airway respiratory problems [66]. However, these methods remain controversial. Some scholars argue that routine expansion or growth correction is not an evidence-based means to improve or cure children's respiratory problems [67]. The assessment and management of early treatment for children with respiratory issues remains inconsistent. Evidence suggests that rapid maxillary expansion may promote the enlargement of the dental arch and the nasomaxillary complex, leading to short-term improvement in mouth breathing. However, the long-term benefits of this approach remain unproven, mainly due to inconsistencies in research methodologies that contribute to limitations in the studies [68]. Nevertheless, these findings highlight the importance of interdisciplinary collaboration among relevant practitioners to diagnose, prevent and treat oral respiration to safeguard children's physical and mental health [69].

3.5 Tongue position management

3.5.1 Causes of abnormal tongue position

Many factors, primarily environmental and functional, are related to the dental characteristics of growing children from the earliest years of life. For example, altered breathing patterns, specifically mouth breathing, are linked to a downward mandible position, which affects the tongue's resting position and can make individuals susceptible to malocclusions. Furthermore, Mouth breathing is associated with the downward position of the mandible and subsequently, the lower position of the tongue, which may lead to craniofacial growth changes. Therefore, monitoring and managing tongue position should also be considered when children seek early orthodontic treatment.

Swallowing patterns, tongue position, oral habits and breathing patterns are the most frequently mentioned musculoskeletal and muscle function issues that may influence muscular activity in growing individuals. Muscular activity, in turn, interacts with the underlying facial skeleton and dentition [70]. Limited studies exist on malocclusions independent of tongue position; however, abnormal tongue activity during rest, swallowing and speaking increases the occurrence of malocclusion, especially in children with deciduous teeth. Tongue position and movement abnormalities typically indicate early adverse oral habits in children. Macroglossia or tongue rigidity may be attributed to local or systemic factors. In summary, issues related to the tongue can lead to dental problems, such as anterior open bite and dental crowding, prompting children to seek orthodontic treatment. Therefore, practitioners need to possess the relevant professional expertise.

3.5.2 Key points of tongue position management

Proper tongue hygiene is essential for controlling bacteria responsible for dental caries [71]. Practitioners should prioritize whole mouth hygiene, including tongue hygiene. Furthermore, correct oral posture and proper tongue resting position can contribute to the normal function and morphology of the orofacial muscles. During early growth and development, active appliances are utilized to correct the movements of oral and perioral muscle tissue. Reports indicate that muscle-strengthening exercises conducted with active appliances can help 60% of children achieve a more optimal tongue position in the anterior region of the hard palate [72]. In patients with early oral respiratory development, the rapid expansion of the maxilla promotes correct tongue position, although it does not significantly alter the position of the hyoid bone. Post-treatment assessments reveal that the dorsum of the tongue tends to approach the palatine fornix, yet the hyoid position remains unchanged [73]. This underscores the importance of tongue position as a critical assessment aspect in children undergoing early orthodontic treatment. Therefore, re-education of tongue position and movement during rest and swallowing and orofacial myofunctional therapy to improve swallowing and tongue posture are advocated not only to help children improve their bad habits but also to address malocclusion and establish a balanced orofacial muscle system [74, 75].

3.6 Posture management

3.6.1 Causes of abnormal posture

Children experience rapid growth and development, making this period crucial for establishing proper body posture. Notably, head posture deviations were found in 52.5% of children aged 6–15 years, with over half exhibiting a forward head posture [76]. A cross-sectional survey study demonstrated a high prevalence of postural deviations in schoolchildren, revealing forward head tilt in 53.5% of cases, shoulder elevation was present in 74.3% of instances,

iliac crest asymmetry was evident in 51.7% of subjects, knee valgus was identified in 43.1% of subjects. Thoracic and lumbar kyphosis were present in 30.2% and 37.2% of subjects, respectively [77]. Obstructive conditions of the nasopharyngeal airway, caused by factors such as ethnicity, gender, age, temporomandibular joint disorder and various chronic diseases like adenoid hypertrophy, nasal allergies and obstructive sleep apnea, are closely related to head and cervical spine posture [78]. A large number of studies have shown that children with abnormal posture are more likely to have occlusal and facial problems [79–81]. Poor posture, particularly cranial positioning of the cervical spine, can lead to changes in head and neck alignment and airway dynamics, resulting in muscular dysfunction in the craniofacial region and adversely affecting facial development, tooth calcification, dentition and jaw positioning [80, 82]. Therefore, children seeking early correction in the clinic should also pay special attention to abnormal posture.

3.6.2 Main points of posture monitoring and management

Abnormal posture can lead to changes in craniofacial structure. An interaction may exist between body posture and mandibular position; for instance, cervical curvature is potentially associated with mandibular retrusion [83]. Recent studies also suggest a relationship between head posture and mandibular position [84]. There was a clear association between an overextended head posture and dental crowding in the lower arch [85]. In contrast, spinal lateral bending posture was significantly associated with an underbite and deviated mandibular midline. Children with spinal protrusion tend to have a smaller SNB angle [86].

Moreover, a weak positive correlation exists between head posture and facial profile. Children with a more forward-leaning head posture tend to exhibit a more protrusive facial profile [76]. Standard adverse body postural conditions, such as excessive lumbar curvature, forward pelvis, knee hyperextension and cranial cervical antiarch, should raise clinical suspicion, especially for children with mandibular retraction and abnormal cranio-neck and scapular postural conditions. Effective communication with parents is essential for timely orthopedic and rehabilitation treatment referrals. Photogrammetry can analyze head posture and facial profile by measuring the cranial base and the angle between glabella-subnasale-pogonion [87]. Dentists can prevent or treat malocclusion by correcting poor head and cervical posture. It is reported that the twin block appliance facilitates a more upright craniocervical posture [88]. Modifications to occlusal balance can resonate with postural equilibrium by adjusting subjects' static morphological patterns and proprioceptive distribution of muscle tonicity [89]. This suggests that clinical corrections by orthodontists can yield significantly improved outcomes.

Additionally, some researchers propose using occlusal splints and intelligent postural correction orthotics to treat children [90, 91]. In early treatment, assessing posture correction and correcting abnormal head, neck and general posture should not be underestimated. Specialists such as dentists, pediatricians, family physicians, otolaryngologists and physical therapists should work as a team to prevent or correct poor posture in children. Posture abnormality should be considered as part of orthodontic clinical evaluation, and more substantial research is expected to support it in the future.

3.7 Psychological monitoring

3.7.1 Causes of psychological problems

The positive growth of children between the ages of 6 and 12 encompasses not only a physical change but also a psychological maturation. Due to their developmental stage, pediatric patients often exhibit anxiety, fear and avoidance or refusal of treatment during dental procedures. Thus, it is essential to consider patients' physical, psychological and emotional states when selecting optimal treatment plans and predicting their effectiveness.

3.7.2 Key points of psychological monitoring

Studies have shown that utilizing psychological intervention in the treatment process, such as instruction, demonstration, manipulation, behavior modeling and positive reinforcement, can effectively alleviate psychological problems in children [92]. A systematic retrieval and evaluation of basic behavior management techniques (BMTs) is also very effective in pediatric patients [93]. Cognitive behavioral therapy can reduce children's fear and anxiety, enabling participants to undergo dental treatment [94] willingly. At the same time, during the early treatment period, it is vital to monitor psychological changes and address the emotional needs of children patients to create a suitable environment for their healthy development.

4. Summary

Extensive literature has shown that early correction can improve malocclusion and promote normal bone development in children. However, a standardized process of early treatment has not been wholly unified. Clinicians must focus on monitoring caries, periodontal health, eruption problems, tongue position, breathing and posture, and psychological management in the early treatment to provide more scientific and practical help in children's growth and development (Fig. 1). This paper's strength lies in its multidisciplinary perspective, offering comprehensive action plans for orthodontic specialists during early treatment. It seeks to improve clinical practice guidelines by combining and summarizing different early orthodontic therapy techniques. However, this article focuses on typical clinical disorders because of the variety and complexity of the clinical settings. From an orthodontist's perspective, some of the contents focus on points different from those of specialists. This further demonstrates that early orthodontic treatment requires the cooperation of dentists, pediatricians, otolaryngologists and orthopedists to provide professional and effective management for child growth and development [95].

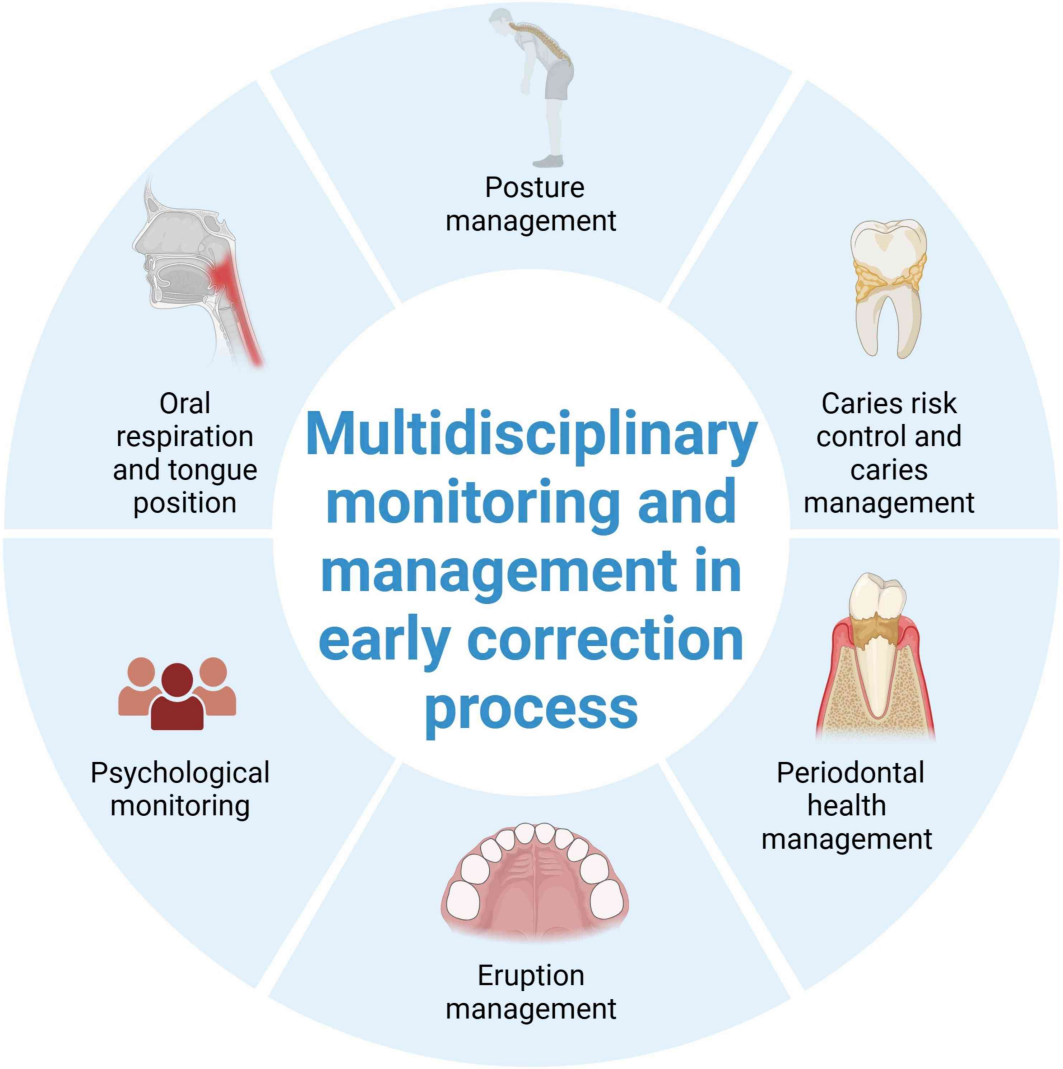

FIGURE 1. Early treatment requires multidisciplinary management that focuses on monitoring dental caries, periodontal health, teething issues, tongue position, breathing and posture, as well as psychological management.

AVAILABILITY OF DATA AND MATERIALS

All data generated or analyzed during this study are included in this published article.

AUTHOR CONTRIBUTIONS

QS—designed the research study and performed the research; wrote the manuscript. ZYZ—provided help and advice on the research. Both authors contributed to editorial changes in the manuscript. Both authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

[1] Zhou C, Duan P, He H, Song J, Hu M, Liu Y, *et al*. Expert consensus on pediatric orthodontic therapies of malocclusions in children. International Journal of Oral Science. 2024; 16: 32.

[2] Jeyashree T, Gurunathan D, Padmapriya S. Association of malocclusion and trauma in children: a retrospective study. Journal of Advanced Pharmaceutical Technology & Research. 2022; 13: S212–S216.

[3] Hansen C, Markström A, Sonnesen L. Specific dento-craniofacial

characteristics in non-syndromic children can predispose to sleep-disordered breathing. Acta Paediatrica. 2022; 111: 473–477.
[4] Khayat N, Winocur E, Kedem R, Winocur Arias O, Zaghal A, Shpack N. The prevalence of temporomandibular disorders and dental attrition levels in patients with posterior crossbite and/or deep bite: a preliminary prospective study. Pain Research & Management. 2021; 2021: 8827895.
[5] Ramos ITM, Nabarrette M, Vedovello-Filho M, de Menezes CC, de C Meneghim M, Vedovello SAS. Correlation between malocclusion and history of bullying in vulnerable adolescents. Angle Orthodontist. 2022; 92: 677–682.
[6] Zou J, Meng M, Law CS, Rao Y, Zhou X. Common dental diseases in children and malocclusion. International Journal of Oral Science. 2018; 10: 7.
[7] Liu X, Xu J, Li S, Wang X, Liu J, Li X. The prevalence of gingivitis and related risk factors in schoolchildren aged 6–12 years old. BMC Oral Health. 2022; 22: 623.
[8] Declercq L, Vichos S, Rajbhoj AA, Begnoni G, Willems G, Verdonck A, *et al*. Correlation between oral muscle pressure and malocclusion in mixed dentition: a cross-sectional study. Clinical Oral Investigations. 2024; 28: 412.
[9] Keerthi VN, Kanya SD, Babu KP, Mathew A, Kumar AN. Early prevention and intervention of Class II division 1 in growing patients. Journal of International Society of Preventive and Community Dentistry. 2016; 6: S79–S83.
[10] Morales-Salazar SA, Monteagudo-Sangama JM, Arriola-Guillén LE. Influence of dentofacial characteristics on the appearance of self-reported bullying: a review. Dental and Medical Problems. 2022; 59: 657–661.
[11] Ardani IGAW, Sanjaya ML, Sjamsudin J. Cephalometric characteristic of skeletal Class II malocclusion in Javanese population at universitas Airlangga dental hospital. Contemporary Clinical Dentistry. 2018; 9: S342–S346.
[12] Sinha A, Subashree S, Avirachan TV, Imran M, Chidambaram D, Prasad SMV. Effect of early orthodontic treatment on long-term stability of Class II malocclusions. Journal of Pharmacy and Bioallied Sciences. 2024; 16: S1808–S1810.
[13] Veitz-Keenan A, Liu N. One phase or two phase orthodontic treatment for Class II division 1 malocclusion? Journal of Evidence-based Dental Practice. 2019; 20: 72–73.
[14] Maspero C, Galbiati G, Giannini L, Guenza G, Farronato M. Class II division 1 malocclusions: comparisons between one- and two-step treatment. European Journal of Paediatric Dentistry. 2018; 19: 295–299.
[15] Huo B, Che X, Li X. Timing of early correction of mandibular hypoplasia in skeletal class II malocclusion: a review. Journal of Clinical Pediatric Dentistry. 2023; 47: 11–20.
[16] Quinzi V, Salvati SE, Pisaneschi A, Palermiti M, Marzo G. Class III malocclusions in deciduous or early mixed dentition: an early orthopaedic treatment. European Journal of Paediatric Dentistry. 2023; 24: 42–44.
[17] Smyth RSD, Ryan FS. Early treatment of class III malocclusion with facemask. Journal of Evidence-based Dental Practice. 2017; 18: 107–108.
[18] Shao JP, Bai XQ, Liu J, Guo X. Dental occlusion and maxillofacial changes after correction of early crossbite with FR-III. Journal of the First Military Medical University. 2004; 24: 464–466. (In Chinese)
[19] Woon SC, Thiruvenkatachari B. Early orthodontic treatment for Class III malocclusion: a systematic review and meta-analysis. American Journal of Orthodontics and Dentofacial Orthopedics. 2017; 151: 28–52.
[20] Jha AK, Chandra S. Early management of Class III malocclusion in mixed dentition. International Journal of Clinical Pediatric Dentistry. 2021; 14: 331–334.
[21] Paoloni V, De Razza FC, Franchi L, Cozza P. Stability prediction of early orthopedic treatment in Class III malocclusion: morphologic discriminant analysis. Progress in Orthodontics. 2021; 22: 34.
[22] Ganesh R, Mohapatra A, Kalpakuri R, Khan MM, Jain T, Dubey A, *et al*. Prevalence and management of early childhood caries in preschoolers. Journal of Pharmacy and Bioallied Sciences. 2024; 16: S2579–S2581.
[23] Kumar CM, Swarnim S. Dental caries in children: an update. Indian Pediatrics. 2024; 61: 281–284.
[24] Shukla C, Maurya RK, Singh V, Tijare M. Evaluation of changes in Streptococcus mutans colonies in microflora of the Indian population with fixed orthodontics appliances. Dental Research Journal. 2016; 13: 309–314.
[25] Chandra S, Jha AK, Asiri SN, Naik A, Sharma S, Nair A, *et al*. Effect of fixed orthodontic appliances on oral microbial changes and dental caries risk in children: a 6-month prospective study. Journal of Pharmacy and Bioallied Sciences. 2024; 16: S2353–S2355.
[26] Featherstone JDB, Crystal YO, Alston P, Chaffee BW, Doméjean S, Rechmann P, *et al*. A comparison of four caries risk assessment methods. Frontiers in Oral Health. 2021; 2: 656558.
[27] Granja GL, Bernardino VMM, Lima LCM, Araújo LJS, Arruda MJALLA, Ferreira FM, *et al*. Orofacial dysfunction, nonnutritive sucking habits, and dental caries influence malocclusion in children aged 8–10 years. American Journal of Orthodontics and Dentofacial Orthopedics. 2022; 162: 502–509.
[28] Mai W, Xiao L, Chen S, Chen S, Li A, Zhang T, *et al*. Prevalence and contributing factors of malocclusion in Zhuang children aged 7–8 years in southern China. Frontiers in Pediatrics. 2024; 12: 1308039.
[29] Tinanoff N. Caries management pathways for children: IAPD global policy statement. International Journal of Paediatric Dentistry. 2024; 34: 199–201.
[30] S K, George S, Soman A, Jo S, Beegum F, Habibullah MA. Salivary proteinase 3 as a biomarker for caries severity in children: a cross-sectional study. Journal of Contemporary Dental Practice. 2024; 25: 236–240.
[31] Manohar PS, Subramaniam P. Oral health-related quality of life and oral hygiene of children and adolescents with hearing impairment. International Journal of Clinical Pediatric Dentistry. 2022; 15: 311–315.
[32] Hasegawa Y, Batbayar N, Sukhbaatar N, Bazar A, Kageyama I. Relationship between index of orthodontic treatment need dental health component (IOTN-DHC) and caries prevalence in school-age children. International Journal of Dental Hygiene. 2023; 21: 582–589.
[33] American Academy of Periodontology-Research, Scicence and therapy Committee. Periodontal diseases of children and adolescents. Pediatric Dentistry. 2008; 30: 240–247.
[34] Bernhardt O, Krey KF, Daboul A, Völzke H, Kindler S, Kocher T, *et al*. New insights in the link between malocclusion and periodontal disease. Journal of Clinical Periodontology. 2019; 46: 144–159.
[35] Gomes SC, Varela CC, da Veiga SL, Rösing CK, Oppermann RV. Periodontal conditions in subjects following orthodontic therapy. A preliminary study. European Journal of Orthodontics. 2007; 29: 477–481.
[36] Rădeanu AC, Surpăţeanu M, Munteanu CM, Liliac IM, Popescu AD, Andrei EC, *et al*. Periodontal changes induced by fixed orthodontic therapy. Medical and Pharmaceutical Reports. 2024; 97: 370–379.
[37] Hadzic S, Gojkov-Vukelic M, Pasic E, Jahic IM, Muharemovic A, Redzepagic-Vrazalica L, *et al*. Evaluation of periodontal changes in patients before, during, and after a fixed orthodontic therapy. Materia Socio-Medica. 2022; 34: 121–125.
[38] Pazzini CA, Júnior GO, Marques LS, Pereira CV, Pereira LJ. Prevalence of nickel allergy and longitudinal evaluation of periodontal abnormalities in orthodontic allergic patients. Angle Orthodontist. 2009; 79: 922–927.
[39] Alsulaiman AA, Kaye E, Jones J, Cabral H, Leone C, Will L, *et al*. Incisor malalignment and the risk of periodontal disease progression. American Journal of Orthodontics and Dentofacial Orthopedics. 2018; 153: 512–522.
[40] Arai Y, English JD, Ono N, Ono W. Effects of antiresorptive medications on tooth root formation and tooth eruption in paediatric patients. Orthodontics & Craniofacial Research. 2023; 26: 29–38.
[41] Jain P, Rathee M. Anatomy, head and neck, tooth eruption. StatPearls Publishing: Treasure Island (FL). 2023.
[42] Henklein SD, Küchler EC, Proff P, Lepri CP, Baratto-Filho F, Mattos NHR, *et al*. Prevalence and local causes for retention of primary teeth and the associated delayed permanent tooth eruption. Journal of Orofacial Orthopedics. 2024; 85: 73–78.
[43] Küchler EC, Henklein SD, Proff P, Lepri CP, Perin CP, Paddenberg E, *et al*. Single nucleotide polymorphisms in COX2 is associated with persistent primary tooth and delayed permanent tooth eruption. International Journal of Environmental Research and Public Health. 2022; 19: 10047.
[44] Papadopoulou CI, Sifakakis I, Tournis S. Metabolic bone diseases affecting tooth eruption: a narrative review. Children. 2024; 11: 748.
[45] Khanna S, Rao D, Panwar S, Pawar BA, Ameen S. 3D printed band and

loop space maintainer: a digital game changer in preventive orthodontics. Journal of Clinical Pediatric Dentistry. 2021; 45: 147–151.

[46] Li N, Li L, Wang LY, Wang TJ. 3D printing device for personalized traction of impacted maxillary central incisor. Journal of Modern Stomatology. 2021; 35: 427–428. (In Chinese)

[47] Xia LP, Zhang MY. Causes and early intervention measures of abnormal eruption of maxillary permanent anterior teeth. Journal of Contemporary Clinical Medicine. 2023; 36: 54–55. (In Chinese)

[48] Guo XK, Liu JF, Zhao JH, Man WQ, Ding J. Effect of extraction timing of mesiodens on orthodontic treatment duration for abnormal eruption of permanent teeth in children. Journal of Dental Prevention & Treatment. 2023; 31: 567–572. (In Chinese)

[49] Hsiao CC, Boynton JR. Etiology, classification and management of ectopic eruption of permanent first molars. Journal of the Michigan Dental Association. 2016; 98: 26–30.

[50] Lanteri V, Cagetti MG, Ugolini A, Gaffuri F, Maspero C, Abate A. Skeletal and dentoalveolar changes obtained with customised and preformed eruption guidance appliances after 1-year treatment in early mixed dentition. European Journal of Paediatric Dentistry. 2023; 24: 180–187.

[51] Lin L, Zhao T, Qin D, Hua F, He H. The impact of mouth breathing on dentofacial development: a concise review. Frontiers in Public Health. 2022; 10: 929165.

[52] Pawłowska-Seredyńska K, Umławska W, Resler K, Morawska-Kochman M, Pazdro-Zastawny K, Kręcicki T. Craniofacial proportions in children with adenoid or adenotonsillar hypertrophy are related to disease duration and nasopharyngeal obstruction. International Journal of Pediatric Otorhinolaryngology. 2020; 132: 109911.

[53] Pereira CB, Yu X, Czaplik M, Rossaint R, Blazek V, Leonhardt S. Remote monitoring of breathing dynamics using infrared thermography. Biomedical Optics Express. 2015; 6: 4378–4394.

[54] Festa P, Mansi N, Varricchio AM, Savoia F, Calì C, Marraudino C, *et al*. Association between upper airway obstruction and malocclusion in mouth-breathing children. Acta Otorhinolaryngologica Italica. 2021; 41: 436–442.

[55] Coban G, Buyuk SK. Sleep disordered breathing and oral health-related quality of life in children with different skeletal malocclusions. CRANIO®. 2025; 43: 70–77.

[56] Cheng B, Mohamed AS, Habumugisha J, Guo Y, Zou R, Wang F. A study of the facial soft tissue morphology in nasal- and mouth-breathing patients. International Dental Journal. 2023; 73: 403–409.

[57] Wang G, Saif BS, Cheng B, Li H, Li Y, Liu J, *et al*. Effect of breathing patterns on mandibular cortical bone quality in children and establishment of a preliminary screening model. BMC Oral Health. 2023; 23: 808.

[58] Huang X, Gong X, Gao X. Age-related hypertrophy of adenoid and tonsil with its relationship with craniofacial morphology. BMC Pediatrics. 2023; 23: 163.

[59] Bruun SN, Hansen C, Sonnesen L. Sleepiness in children with severe malocclusion compared with in children with neutral occlusion. American Journal of Orthodontics and Dentofacial Orthopedics. 2024; 165: 593–601.

[60] Gomez YPS, Rockenbach NM, Moraes AB, Corrêa EC, Silva AMTD, Busanello-Stella AR. Influence of breathing modes and facial growth patterns on electromyographic fatigue of masticatory muscles in children. International Archives of Otorhinolaryngology. 2023; 27: e672–e679.

[61] Mattar SE, Valera FC, Faria G, Matsumoto MA, Anselmo-Lima WT. Changes in facial morphology after adenotonsillectomy in mouth breathing children. International Journal of Paediatric Dentistry. 2011; 21: 389–396.

[62] Lysy J, Karkazi F, Stanko P, Novak B. The influence of mouth breathing on skeletal and dental features of splanchnocranium. Bratislava Medical Journal. 2021; 122: 196–199.

[63] Chambi-Rocha A, Cabrera-Domínguez ME, Domínguez-Reyes A. Breathing mode influence on craniofacial development and head posture. The Journal of Pediatrics. 2018; 94: 123–130.

[64] Marciuc D, Morarasu S, Morarasu BC, Marciuc EA, Dobrovat BI, Pintiliciuc-Serban V, *et al*. Dental appliances for the treatment of obstructive sleep apnea in children: a systematic review and meta-analysis. Medicina. 2023; 59: 1447.

[65] Ferati K, Bexheti-Ferati A, Palermo A, Pezzolla C, Trilli I, Sardano R, *et al*. Diagnosis and orthodontic treatment of obstructive sleep apnea syndrome children—a systematic review. Diagnostics. 2024; 14: 289.

[66] Xie B, Zhang L, Lu Y. The role of rapid maxillary expansion in pediatric obstructive sleep apnea: efficacy, mechanism and multidisciplinary collaboration. Sleep Medicine Reviews. 2023; 67: 101733.

[67] Kandasamy S. Obstructive sleep apnea and early orthodontic intervention: How early is early? American Journal of Orthodontics and Dentofacial Orthopedics. 2024; 165: 500–502.

[68] Sakai RH, de Assumpção MS, Ribeiro JD, Sakano E. Impact of rapid maxillary expansion on mouth-breathing children and adolescents: a systematic review. Journal of Clinical and Experimental Dentistry. 2021; 13: e1258–e1270.

[69] Bucci R, Rongo R, Zunino B, Michelotti A, Bucci P, Alessandri-Bonetti G, *et al*. Effect of orthopedic and functional orthodontic treatment in children with obstructive sleep apnea: a systematic review and meta-analysis. Sleep Medicine Reviews. 2023; 67: 101730.

[70] Subtelny JD, Subtelny JD. Oral habits–studies in form, function, and therapy. Angle Orthodontist. 1973; 43: 349–383.

[71] Mosaico G, Pinna M, Grassi R, Orrù G, Scribante A, Maiorani C, *et al*. Oral health and caries prevention: how tongue hygiene helps maintain balance of microbiota and overall health in pediatric patients. Children. 2024; 11: 816.

[72] Degan VV, Puppin-Rontani RM. Removal of sucking habits and myofunctional therapy: establishing swallowing and tongue rest position. Pro-Fono Revista de Atualização Científica. 2005; 17: 375–382. (In Portuguese)

[73] D'Alessandro G, Bagattoni S, Montevecchi M, Piana G. Rapid maxillary expansion on oral breathing children: effects on tongue location, hyoid position and breathing. A pilot study. Minerva Dental and Oral Science. 2021; 70: 97–102.

[74] Shah SS, Nankar MY, Bendgude VD, Shetty BR. Orofacial myofunctional therapy in tongue thrust habit: a narrative review. International Journal of Clinical Pediatric Dentistry. 2021; 14: 298–303.

[75] Koletsi D, Makou M, Pandis N. Effect of orthodontic management and orofacial muscle training protocols on the correction of myofunctional and myoskeletal problems in developing dentition. A systematic review and meta-analysis. Orthodontics & Craniofacial Research. 2018; 21: 202–215.

[76] Rosita M, Budiardjo SB, Rizal MF. Photometric analysis of the relationship between craniovertebral angle and facial profile in children aged 10–12 years. Saudi Dental Journal. 2024; 36: 277–280.

[77] Batistão MV, Moreira R de FC, Coury HJCG, Salasar LEB, Sato T de O. Prevalence of postural deviations and associated factors in children and adolescents: a cross-sectional study. Fisioterapia em Movimento. 2016; 29: 777–785.

[78] Peng H, Liu W, Yang L, Zhong W, Yin Y, Gao X, *et al*. Does head and cervical posture correlate to malocclusion? A systematic review and meta-analysis. PLOS ONE. 2022; 17: e0276156.

[79] Sandoval C, Díaz A, Manríquez G. Relationship between craniocervical posture and skeletal class: a statistical multivariate approach for studying Class II and Class III malocclusions. CRANIO®. 2021; 39: 133–140.

[80] Ghafoor HA, Hussain SS. Relationships of sagittal skeletal discrepancy, natural head position, and craniocervical posture in Pakistani children. Journal of College of Physicians and Surgeons Pakistan. 2024; 34: 313–317.

[81] Priede D, Roze B, Parshutin S, Arkliņa D, Pircher J, Vaska I, *et al*. Association between malocclusion and orofacial myofunctional disorders of pre-school children in Latvia. Orthodontics & Craniofacial Research. 2020; 23: 277–283.

[82] Ferrillo M, Migliario M, Curci C, Roccuzzo A, Invernizzi M, de Sire A. Reliability of dental calcification compared to hand-wrist X-ray to evaluate skeletal maturation in growing subjects: a systematic review. Journal of Biological Regulators and Homeostatic Agents. 2021; 35: 717–723.

[83] Springate SD. A re-investigation of the relationship between head posture and craniofacial growth. European Journal of Orthodontics. 2012; 34: 397–409.

[84] Zokaitė G, Lopatienė K, Vasiliauskas A, Smailienė D, Trakinienė G. Relationship between craniocervical posture and sagittal position of the mandible: a systematic review. Applied Sciences. 2022; 12: 5331.

[85] Pachì F, Turlà R, Checchi AP. Head posture and lower arch dental crowding. Angle Orthodontist. 2009; 79: 873–879.
[86] Sambataro S, Bocchieri S, Cervino G, La Bruna R, Cicciù A, Innorta M, *et al*. Correlations between malocclusion and postural anomalies in children with mixed dentition. Journal of Functional Morphology and Kinesiology. 2019; 4: 45.
[87] Weber P, Corrêa ECR, Milanesi JM, Soares JC, Trevisan ME. Craniocervical posture: cephalometric and biophotogrammetric analysis. Brazilian Journal of Oral Sciences. 2012; 11: 416–421.
[88] El Aouame A, Daoui A, El Quars F. Nasal breathing and the vertical dimension: a cephalometric study. International Orthodontics. 2016; 14: 491–502.
[89] El Zoghbi A, Halimi M, Hobeiche J, Haddad C. Effect of occlusal splints on posture balance in patients with temporomandibular joint disorder: a prospective study. The Journal of Contemporary Dental Practice. 2021; 22: 615–619.
[90] Ferrillo M, Marotta N, Giudice A, Calafiore D, Curci C, Fortunato L, *et al*. Effects of occlusal splints on spinal posture in patients with temporomandibular disorders: a systematic review. Healthcare. 2022; 10: 739.
[91] AlGadhib F, AlQahtani R, AlBej R, AlOtaibi W, AlFakih E, Ateeq IS. Design of a smart posture corrective orthosis for kyphotic patients. The Canadian Medical and Biological Engineering Society. 2021; 44: 11–13.
[92] Sun IG, Chu CH, Lo ECM, Duangthip D. Global prevalence of early childhood dental fear and anxiety: a systematic review and meta-analysis. Journal of Dentistry. 2024; 142: 104841.
[93] Gizani S, Seremidi K, Katsouli K, Markouli A, Kloukos D. Basic behavioral management techniques in pediatric dentistry: a systematic review and meta-analysis. Journal of Dentistry. 2022; 126: 104303.
[94] Schibbye R, Hedman-Lagerlöf E, Kaldo V, Dahllöf G, Shahnavaz S. Internet-based cognitive behavioral therapy for children and adolescents with dental or injection phobia: randomized controlled trial. Journal of Medical Internet Research. 2024; 26: e42322.
[95] Abdelmagid SME, Abass SK. Knowledge and practice towards early orthodontic problems among general dentists and paediatric dentists. Journal of Orthodontic Science. 2023; 50: 39–44.

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