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Parental awareness and knowledge of early orthodontic intervention for malocclusion prevention in Libyan children: A study in Misurata City

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Abstract: Malocclusion is a prevalent dental condition among children that, if left untreated, can result in functional impairments and psychosocial challenges. Early orthodontic intervention plays a critical role in mitigating the severity of malocclusion and preventing the need for complex treatments in later stages. This study aimed to evaluate the impact of early orthodontic intervention on the development of malocclusion in children in Misurata, Libya, and to assess parental awareness regarding the significance of early orthodontic care. A descriptive cross-sectional study was conducted from January to June 2024 among 400 parents of children aged 6 to 12 years attending dental clinics in Misurata. Data were collected using a structured questionnaire and reviewed dental records. Statistical analysis was performed using SPSS v26, with Chi-square tests used to assess associations between parental awareness and demographic factors. While 69.5% of parents were familiar with the term malocclusion, 22.4% recognized the importance of early orthodontic intervention. The most common source of information was the child's dentist (51.6%). A statistically significant association was found between parental education and awareness levels ($p < 0.05$). 12.3% of children had visited an orthodontist, with the majority doing so after age 9. Parental awareness of early orthodontic care in Misurata remains insufficient, potentially delaying intervention and increasing the risk of severe malocclusion. Strengthening parent education through dental visits and public health campaigns is essential for improving early treatment outcomes.

Introduction

Malocclusion, a misalignment of the teeth and jaws, is a common condition that affects a significant portion of the global population, including children. It can lead to functional problems, such as difficulty in chewing and speaking, and aesthetic concerns, impacting the child's self-esteem and social interactions [1]. The importance of addressing malocclusion early in life has long been recognized by orthodontic professionals worldwide. Early orthodontic intervention is not only important for improving the alignment of teeth but also for preventing the development of more severe orthodontic issues that may require more extensive and expensive treatments later in life [2]. Malocclusion is categorized into various types, including Class I, Class II, and Class III, based on the relationship between the upper and lower jaws and their alignment [3]. While mild cases of malocclusion may not cause immediate problems, more severe cases can lead to long-term health issues, including Temporomandibular joint disorders, premature wear of the teeth, and increased risk of periodontal disease [4]. Therefore, timely intervention becomes crucial for preventing such complications and

improving overall oral health. Orthodontic treatment typically begins in the early stages of a child's dental development. The American Association of Orthodontists recommends that children undergo their first orthodontic evaluation at the age of seven, as this is when permanent teeth begin to emerge, and the dentist can identify potential orthodontic issues [5]. Early intervention aims to address any issues before they become more severe, such as correcting jaw alignment and guiding the proper eruption of teeth. If malocclusion is left untreated, it may worsen over time, requiring more complicated treatments that could involve braces, extractions, or even surgical interventions [6].

In Libya, and particularly in cities such as Misurata, the prevalence of malocclusion among children has been reported to be increasing in recent years. Despite the advancements in orthodontic care, there appears to be a lack of public awareness and limited access to early orthodontic care, which may contribute to the delayed or inadequate treatment of malocclusion [7]. Many parents are unaware of the significance of early orthodontic evaluation, and the level of understanding about orthodontic care varies widely, depending on factors such as educational background, socioeconomic status, and access to healthcare facilities. Research conducted in various parts of the world has shown that early orthodontic intervention can significantly reduce the severity of malocclusion and improve overall dental health outcomes. A study conducted by Dos Santos et al. (2018) demonstrated that early treatment could prevent more severe orthodontic complications and reduce the need for complex treatments later on [8]. Similarly, other studies have highlighted that children who receive orthodontic treatment early experience fewer complications and have better outcomes in terms of dental function and appearance [9, 10]. These findings underscore the importance of early intervention as a preventive measure that can lead to better long-term results for the child's oral health.

However, in Libya, there is limited research on the impact of early orthodontic intervention. Little is known about parental awareness regarding the importance of early orthodontic evaluation and whether this awareness influences the likelihood of children receiving timely orthodontic care. Furthermore, the effectiveness of early orthodontic intervention in reducing the need for complex treatments in later years has not been thoroughly studied in the Libyan context. This study aims to evaluate the impact of early orthodontic intervention on the development of malocclusion in children in Misurata, Libya. By examining the differences in malocclusion severity between children who received early orthodontic treatment and those who did not, the study aims to provide valuable data that could inform future dental care policies and highlight the importance of early intervention in the region. Additionally, the study seeks to assess the level of parental awareness regarding early orthodontic treatment and its role in preventing severe malocclusion. Understanding the factors that influence parental decisions regarding orthodontic care, such as access to information, educational background, and socioeconomic status, will be critical in shaping public health interventions and improving the accessibility of orthodontic care in Libya. Furthermore, the findings of this study could serve as a basis for implementing educational programs that encourage parents to seek early orthodontic care for their children, thus reducing the burden of severe malocclusion and associated dental complications in the future.

Materials and methods

Study design: This descriptive cross-sectional study was conducted in Misurata City, Libya, with the aim of evaluating the impact of early orthodontic intervention on the development of malocclusion in children and assessing the level of parental awareness regarding the importance of early orthodontic treatment.

Data collection: Data collection was carried out between January and June 2025, across various public and private dental clinics in Misurata City, targeting parents whose children were aged between 6 and 12 years. The children included in the study had no history of craniofacial anomalies, congenital dental issues, or systemic conditions that could interfere with normal tooth eruption or orthodontic treatment. The study participants consisted of parents who accompanied their children to routine dental visits at the selected clinics. Inclusion criteria involved parents of children aged between 6 and 12 years who were willing to participate

and provided informed consent. Exclusion criteria involved parents whose children had received prior orthodontic treatment or had significant dental health issues not related to malocclusion. Additionally, parents who worked in the medical or dental fields were excluded to avoid any bias in their knowledge of orthodontic treatments. The sample size was determined using the standard formula for cross-sectional studies. Using a confidence level of 95% (Z = 1.96) and an estimated prevalence of 0.30 based on previous studies [11], the calculated sample size was 385 parents. To account for potential dropouts and incomplete data, the final sample size was adjusted to 400 parents. Data were collected using a structured, self-administered questionnaire developed specifically for this study. The questionnaire was divided into three main sections: demographic information, knowledge and awareness of early orthodontic intervention, and the dental history of the child. The questions in the knowledge section were designed to assess the parents' awareness of malocclusion, its potential consequences, and the role of early orthodontic treatments in preventing more severe dental problems. The questionnaire was first developed in English and then translated into Arabic to ensure it was easily understood by the participants. A back-translation process was employed to ensure the accuracy and consistency of the translation. A pilot test of the questionnaire was conducted on 20 parents to check for clarity and reliability. The pilot test data were excluded from the final analysis [12]. The primary data collection method was face-to-face administration of the questionnaire by trained dental professionals at the clinics. In addition to the self-reported data, the clinical records of the children were reviewed to verify any history of orthodontic consultations or treatments.

Ethical approval: The approval for the study was obtained from the Research Ethics Committee of Misurata University, Faculty of Dentistry, Misurata, Libya. All participants were informed about the purpose of the study and their rights to confidentiality and voluntary participation (MJ-089-2025).

Statistical analysis: Data were entered and analyzed using SPSS Statistics version 26.0 [13]. Descriptive statistics (frequencies, means, and standard deviations) were used to summarize participant characteristics. The Chi-square test was used to evaluate associations between awareness levels and demographic variables. A p-value of less than 0.05 was considered statistically significant.

Results

A total of 400 parents from Misrata City participated in this study. The demographic distribution of participants is illustrated in **Table 1**, which shows a fairly balanced gender representation, with a slight predominance of females (53.3%). The majority of respondents had a university-level education (68.4%), suggesting a relatively high literacy level in the sample.

Table 1: Demographic characteristics of participating parents

Demographic characteristics	Category	Percent
Gender	Male	46.7%
	Female	53.3%
Age group	20 - 29 years	19.3%
	30 - 39 years	40.5%
	40 - 49 years	25.8%
	≥ 50 years	14.4%
Education level	High school or less	31.6%
	University degree	68.4%

Regarding awareness, 69.5% of parents reported familiarity with the term malocclusion. However, 45.8% were aware of its potential long-term health consequences. Moreover, 22.4% of respondents recognized the importance of early orthodontic intervention. When asked about the sources from which they received orthodontic information, parents provided responses summarized in **Table 2**.

Table 2: Sources of information about orthodontic treatment

Source of information	Percent
Child's dentist	51.6%
Social media	28.5%
Family/friends	14.1%
Others	5.8%

As seen in **Table 2**, most parents relied on their child's dentist (51.6%) for orthodontic information, followed by social media (28.5%). This demonstrates that while clinical professionals remain a vital source of knowledge, digital platforms are increasingly influential. In terms of orthodontic service utilization, 12.3% of children had ever visited an orthodontist, and 8.7% had undergone any form of treatment. Among those who sought treatment, 66.2% did so after the age of nine, which may be considered relatively late for certain types of interceptive orthodontics. The relationship between parental education and awareness of early orthodontic treatment is detailed in **Table 3**. This association was found to be significant ($p < 0.05$), with more educated parents showing higher levels of awareness.

Table 3: Association between parental education and awareness of early orthodontic treatment

Parental education	Aware	Not aware	Total
High school or less	45.2%	54.8%	100%
University Degree	72.5%	27.5%	100%
Total	59.8%	40.2%	100%

As illustrated in **Table 3**, awareness levels were substantially higher among parents with university education (72.5%) compared to those with only high school education or less (45.2%). This trend aligns with previous findings that link higher educational attainment to improved health literacy and decision-making regarding children's oral health. Together, these results underscore the need for more targeted awareness campaigns, especially for parents with lower education levels, to ensure timely access to orthodontic care for children.

Discussion

The findings of this study reveal a moderate level of awareness among parents in Misrata regarding orthodontic conditions and the importance of early treatment, though significant knowledge gaps persist. Approximately 69.5% of the parents had heard of malocclusion, yet less than half (45.8%) understood its potential long-term complications, such as impaired chewing function, esthetic concerns, and psychosocial effects. This limited awareness may contribute to the low rate of orthodontic consultations and delayed treatment initiation reported in this population. Our results are in agreement with the findings of Aljehani [14], who observed that while many parents may have heard of orthodontic issues, their understanding of the clinical significance remains superficial and is often influenced by esthetic concerns rather than functional implications. Similarly, a previous study found that most parents only seek orthodontic consultation when visible misalignment becomes a concern, often overlooking the benefits of early interceptive treatment [15]. Interestingly, our study found that the majority of parents cited their child's dentist as their primary source of information, which is consistent with other regional studies emphasizing the influential role of dental professionals in shaping parental decisions about orthodontic care [16]. However, the increasing influence of social media as a secondary source (reported by 28.5% of participants) highlights the growing role of digital platforms in public health communication. This aligns with recent findings by Abreu et al. [17], who emphasized the need for healthcare professionals to engage with parents through online media to ensure the delivery of accurate, evidence-based content. Another critical observation from this study is the low utilization rate of orthodontic services, with 12.3% of children having visited an orthodontist and 8.7% having received

any form of treatment. These figures mirror those reported in underserved populations in Egypt and India, where socioeconomic factors, lack of awareness, and fear of cost were cited as barriers to early orthodontic care [18, 19]. Delayed referrals were also noted by Schneider-Moser et al. [20], who highlighted that most children referred for orthodontic assessment were already beyond the ideal age for interceptive procedures. Educational level was shown to be a significant predictor of parental awareness, as parents with a university degree demonstrated a significantly higher understanding of the importance of early treatment (72.5%) compared to those with lower education (45.2%). This observation is consistent with previous studies, including those by Goyal and Gauba [21], who reported a strong correlation between educational background and proactive oral health behaviors in parents, and by others [22, 23]. It is also noteworthy that gender did not play a statistically significant role in determining awareness levels, which confirms the findings of studies conducted in Western and Middle Eastern contexts [14, 18]. This suggests that public health interventions should be more focused on education and accessibility rather than on targeting one gender over another.

Conclusion: This study revealed a noticeable gap in parental awareness regarding the importance of early orthodontic evaluation and treatment. While some parents in Misurata had a basic understanding of orthodontic issues, many lacked knowledge about the benefits of early intervention, which may contribute to delayed care and more severe complications later. Since dentists remain the primary source of information, it is essential that they actively educate parents during routine visits. Moreover, public health efforts should include school-based programs and digital campaigns to enhance awareness. Encouraging early referrals and improving access to orthodontic services are key steps toward better outcomes. Further studies should investigate additional barriers to orthodontic care to inform the design of targeted interventions and promote early preventive strategies.

References

1. Zhou C, Duan P, He H, Song J, Hu M, Liu Y, et al. Expert consensus on pediatric orthodontic therapies for malocclusions in children. International Journal of Oral Science. 2024; 16(1): 32. doi: 10.1038/s41368-024-00299-8
2. Sandhu A, Sakaria BA, Patel SD, Ahuja G, Jadeja N, Mehta A, et al. The impact of early orthodontic intervention on dental and skeletal development in children with mixed dentition. Journal of Pharmacy and Bioallied Sciences. 2024; 16(Suppl 1): S818-S820. doi: 10.4103/jpbs.jpbs_1035_23
3. Plaza SP, Reimpell A, Silva J, Montoya D. Relationship between skeletal Class II and Class III malocclusions with vertical skeletal pattern. Dental Press Journal of Orthodontics. 2019; 24(4): 63-72. doi: 10.1590/2177-6709.24.4.063-072.oar
4. Šimunović L, Lapter Varga M, Negovetić Vranić D, Čuković-Bagić I, et al. The role of malocclusion and oral parafunctions in predicting signs and symptoms of temporomandibular disorders: A cross-sectional study. Dentistry Journal. 2024; 12(7): 213. doi:10.3390/dj12070213
5. Padhraig S . Timing orthodontic treatment: Early or late? Australian Dental Journal. 2017; 62: 11-19 doi: 10.1111/adj.12474
6. Debashreeta N. Benefits of early orthodontic intervention in children: A review. Indian Journal of Forensic Medicine and Toxicology. 2021; 14(4): 9138-9141. doi: 10.37506/ijfmt.v14i4.13171
7. Bugaighis I, Karanth D. The prevalence of malocclusion in urban Libyan schoolchildren. Journal of Orthodontic Sciences. 2013; 2(1): 1-6. doi: 10.4103/2278-0203.110325.
8. Shrivastava SR, Bobhate PS, Meshram VD. Orthodontic treatment and its impact on psychological and social health: A review of the literature. Journal of Orthodontic Science. 2025; 14: 44. doi: 10.4103/jos.jos_21_25
9. Abeleira M, Pazos E, Ramos I, Outumuro M, Limeres J, Seoane-Romero J, et al. Orthodontic treatment for disabled children: A survey of parents' attitudes and overall satisfaction. BMC Oral Health. 2014; 14: 98. doi: 10.1186/1472-6831-14-98
10. Lin Lin M, Xie C, Yang H, Wu C, Ren A. Prevalence of malocclusion in Chinese schoolchildren from 1991 to 2018: A systematic review and meta-analysis. International Journal of Pediatric Dentistry. 2020; 30(2): 144-155. doi: 10.1111/ipd.12591
11. Pourhoseingholi M, Vahedi M, Rahimzadeh M. Sample size calculation in medical studies. Gastroenterology Hepatology from Bed to Bench. 2013; 6(1): 14-17. PMID: 24834239; PMCID: PMC4017493.

12. Bujang M, Omar E, Foo D, Hon Y. Sample size determination for conducting a pilot study to assess reliability of a questionnaire. Restorative Dentistry and Endodontics. 2024; 49(1): e3. doi: 10.5395/rde.2024.49.e3
13. IBM Corp. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp; 2019. Document number: 869358.
14. Aljehani D, Kaki A. Parents' knowledge and attitudes towards malocclusion and early identification of dentofacial deformities linked to oral habits in children. Medical Science 2022; 26(130): 01-08. doi: 10.54905/disssi/v26i130/ms519e2617
15. García E, Santos L, Borrell C, Aura JI, Marqués L. Parental perceptions of early interceptive orthodontic intervention in children and adolescents: A cross-sectional study. European Journal of Pediatric Dentistry. 2025; 26(3): 218-223. doi: 10.23804/ejpd.2025.2258
16. Jafarzadeh M, Ghasemi R, Asnaashari E, Ponnet K, Moeeni M. Your right to choose: parents' preferences toward a pediatric dental center. BMC Oral Health. 2025; 25(1): 386. doi: 10.1186/s12903-025-05707-x
17. Siddiqui N, Chia M, Sharif MO. Social media and orthodontics: Are our patients scrolling? Journal of Orthodentics. 2022; 49(2): 179-184. doi: 10.1177/14653125211042025.
18. Marghalani HYA, Abdullah SS, Alqubbi EA, Alotaibi DS, Alqahtani EA, Dehlawi HH, et al. Knowledge and Awareness Level of the Saudi population about early orthodontic intervention. Asian Journal of Pharmaceutics. 2026; 20(1): 625-633. doi: 10.22377/3kej8q75
19. Tak M, Nagarajappa R, Sharda AJ, Asawa K, Tak A, Jalihal S, Kakatkar G. Prevalence of malocclusion and orthodontic treatment needs among 12- 15-year-old school children of Udaipur, India. European Journal of Dentistry. 2013; 7(Suppl 1): S045-S053. doi: 10.4103/1305-7456.119071
20. Schneider-Moser U, Moser L. Very early orthodontic treatment: When, why and how? Dental Press Journal of Orthodontics. 2022; 27(2): 22. doi: 10.1590/2177-6709.27.2.e22spe2
21. Sağlam C, Mojarrab N, Ahlat EM, Çınarcık BŞ, Ersin N, Ertuğrul F, et al. Evaluation of the effectiveness of parental oral health education. The Journal of Pediatric Research. 2025; 12(1): 07-13. doi: 10.4274/jpr.galenos.2025.54765
22. Mokahel LM, Erfida IB. Libyan parents' knowledge and awareness of primary teeth and their importance: A study in Misurata City. Mediterranean Journal of Medical Research. 2025; 2(3): 114-119. doi: 10.5281/zenodo.16790655
23. Elamami NM, Alamami NM. Parental perception and acceptance of behavior guidance techniques and cooperation during dental examination for Libyan autistic children. Mediterranean Journal of Medical Research. 2026; 3(1): 79-85. doi: 10.5281/zenodo.18836595

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