JOURNAL OF BASHIR INSTITUTE OF HEALTH SCIENCES

RESEARCH ARTICLE

OPEN ACCESS

ARTICLE INFO
Received: 17 October 2025
Revised: 06 May 2026
Published online: 30 June 2026

Orthodontic Awareness, Oral Self-Care, and Social Impact in Malocclusion: A Clinic-Based Cross-Sectional Study in Bhara Kahu

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ABSTRACT

Background: Oral Hygiene is important for overall health, and especially it is important for those patients who are suffering from malocclusion. Poor oral hygiene can cause several issues like infections, dental plaque and affect overall health. Practicing toothbrushing, Fluoride toothpaste, interdental brushes, flossing, mouthwash, regular visits to dentists, and education can lead to the maintenance of good oral hygiene in malocclusion patients. **Methods:** This study was a cross-sectional survey. Data were collected from Tariq Dental Clinic and Bashir Dental Hospital, Bhara Kahu, Islamabad. This study was conducted from August 2024 to November 2024. A convenience sample of 100 patients was recruited, using a pre-structured questionnaire adapted from a previous validated study. **Results:** The result of this study included a total of 100 patients, 69 male and 31 female. Distribution of patients according to their age and gender. 97% of patients clean their teeth. 93% use a toothbrush or toothpaste for brushing, 7% use Datun, finger and charcoal powder. Among all, 74% cleaned their tongue. 46% of respondents brush their teeth twice a day, 42% once a day, 8% more than twice a day, and 6% do not brush their teeth frequently. 34% use dental floss, 23% use wooden toothpicks and 18% use interdental brushes. 79% of the participants do not use tobacco. About 84% of participants were aware of malocclusion of teeth. Of the respondents, 74% were happy with the way their teeth looked, while 26% were not. 16% of patients reported being bullied due to malocclusion. 81% are aware of how malocclusion negatively affects the oral cavity, and 83% of people know that the alignment of teeth would affect their mastication. 76% think malocclusion is caused due to external habits. After learning about the negative consequences of malocclusion, about 86% of the patients desired to have it corrected. Class I sagittal molar occlusion was found in 44% of the sample, while Class II and Class III were found in 40% and 16% of the sample, respectively. **Conclusion:** Most patients clean their teeth, using a toothbrush and clean their tongue, and most of them brush at least twice daily. Other cleaning tools or materials are an interdental brush, mouthwash and dental floss used daily. Most of the patients were aware of malocclusion, and they corrected its ill effects.

Keywords: Dental Awareness, Interdental Cleaning, Malocclusion, Oral Hygiene Practices, Patient Education, Toothbrushing Habits

INTRODUCTION

Malocclusion is defined as an abnormal or wrong position of the teeth of both upper and lower dental arches as they meet as the jaws come together. It is among the most widespread dental issues in the world and may cause various oral health issues like dental caries, periodontal disease, temporomandibular joint pain, and aesthetic issues [1]. According to World Health Organization (WHO), oral health is a condition in which a person does not experience any oral and facial pain, oral and throat cancer, oral infections, periodontal disease, tooth decay, tooth loss and any other disease or disorder that may limit the ability of a person to bite, chew, smile, speak and psychosocial wellbeing [2]. Thus, oral health is an inseparable part of overall health and quality.

Malocclusion may be caused by genetic or environmental factors, and it can occur in individuals of any age. The identification of malocclusion has been changing with time to better understand it and the treatment needs. The first classification of malocclusion was by Edward H. Angle, the father of modern orthodontics, in 1899, according to the relation of the maxillary and mandibular first permanent molars [3]. Normal occlusion is described in the classification of Angle as the mesiobuccally cusp of the upper first molar and the mesiobuccally groove of the lower first molar aligned, and the upper anterior teeth covering the lower teeth by one-third of their crown length. Any deviation from this normal relationship was called malocclusion, which he divided into three major classes [4].

In Class I malocclusion, the molar relation is normal; however, the anterior teeth are crowded, rotated, or spaced. Class II malocclusion is characterised by the lower molar being placed in the back of the upper molar, and it usually leads to a prominent upper jaw or a recessed lower jaw [5]. It is further subdivided into two categories: Class II Division 1, which is more overjet and protruded upper incisors; and Class II Division 2, which is retroclined central incisors and deep overbite. Class III malocclusion entails a forward-facing mandible or a recessed maxilla, which leads to an underbite, with the lower teeth overlapping the upper teeth [1, 5].

Dewey subsequently amended this classification of Angle by sub-classifying Class I and Class III malocclusions into subtypes according to the position of teeth. An example is Class I Type 1, which is the crowding of maxillary anterior teeth by Dewey, and Class III Type 2, which is the crowding of mandibular incisors. These elaborate classification systems enable clinicians to be more specific in their diagnosis of the nature and severity of malocclusion, which is essential in planning treatment [6]. Several etiological factors affect malocclusion. Genetic factors involve inherited differences in jaw size and tooth size, craniofacial developmental pattern, and developmental abnormalities. Malocclusion may also be caused by environmental factors like thumb sucking, tongue thrusting, mouth breathing, trauma, or long-term bottle feeding. Research works by Proffit (1986) and McDonald and Ireland (1998) highlight that genetic factors as well as environmental factors also contribute to the development of the condition, with most of the cases being a result of both factors [7].

Studies have indicated that early childhood oral habits can have a great impact on dental and facial development. An example is that long-term breastfeeding is linked with a reduced risk of developing malocclusion, and early bottle feeding or pacifier use can raise the risk of malocclusion. Although there are conflicting results in the literature, it is usually advisable to encourage natural feeding habits during infancy to achieve the best dental development [8]. Malocclusion is not common in all populations, but it afflicts a significant number of children and adolescents across the globe. Research has shown that malocclusion is present in between 43 and 78% of school-going children [9]. It is not only a condition that has an impact on oral functioning, but it may also have psychosocial implications, especially in adolescence, when appearance and self-image are very important. Severely maloccluded children can be teased or bullied because of the appearance of their teeth, and this can result in a decrease in self-esteem and social anxiety [7, 9].

Malocclusion may affect vital oral activities like swallowing, speech, and chewing. It may also predispose people to gingivitis and dental caries because of the problems of keeping good oral sanitation in the crowded or irregularly positioned teeth. Consequently, there is a tendency to impair oral health-related quality of life (OHRQoL) [10]. OHRQoL includes the functional, psychological and social aspects of oral health, such as comfort when eating, sleeping and social life, and satisfaction with how one looks. The cumulative effect of malocclusion on physical and emotional well-being can therefore be reflected by poor OHRQoL [11]. Several indices have been created to measure the necessity of orthodontic treatment, including the Dental

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Aesthetic Index (DAI), Index of Orthodontic Treatment Need (IOTN), and Index of Complexity, Outcome, and Need (ICON). Among them, the IOTN is especially helpful in detecting certain malocclusion features, such as high overjet, open bite, deep bite, or crowding, and to assess the level and urgency of treatment [10, 11].

The purpose of orthodontic treatment is to correct malocclusion and provide normal occlusal relationships, although it involves maintaining a high level of oral hygiene. Fixed orthodontic appliances also cause more retention of plaque, which predisposes teeth to caries, gingivitis, and enamel demineralisation in the case of poor oral hygiene [12]. Thus, the orthodontists should give their patients detailed oral hygiene guidelines, such as using fluoride toothpaste, interdental brushes, and mouth rinses. Nevertheless, the problem of patient compliance is still a problem in most cases because of the lack of motivation, awareness or appropriate education [12].

The World Health Organization focuses on the significance of recommended oral self-care (ROSC), including brushing at least twice a day with fluoride toothpaste and reducing the consumption of sugar. These preventive measures are especially important in the case of people with malocclusion or undergoing orthodontic therapy. Research has shown that patients with good oral health throughout orthodontic therapy have fewer complications and overall improved outcomes [13]. The awareness and oral hygiene practice of patients is thus crucial in the development of effective educational and preventive programs. As malocclusion is not only a dental issue, but also a psychological and social issue in life, it is necessary to be informed about its causes, effects, and prevention measures. The current research aimed to examine the degree of awareness and oral hygiene behavior among patients with malocclusion. This study will help to facilitate better oral health practices and assist in the better management of the malocclusion-related issues in the community by identifying the gaps in knowledge and behavior.

MATERIALS AND METHOD

This is a cross-sectional survey study that was carried out to assess the degree of knowledge and awareness about oral hygiene practices among patients with malocclusion. The research was conducted in Tariq Dental Clinic and Bashir Dental Hospital in Bhara Kahu, Islamabad. The study was carried out for four months, between August 2024 and November 2024. The population of the study was rural patients of Islamabad, to be more precise, the residents of Bhara Kahu. A convenience sample of 100 patients between the age group of 13 and 40 years was recruited. Malocclusion was diagnosed by a qualified dentist using Angle's classification through clinical examination. The participants in this age group and diagnosed with malocclusion were eligible, whereas those younger than 13 years, older than 40 years, and not diagnosed with malocclusion could not be included in the participation. Class I malocclusion in this study refers to Angle Class I, where the molar relationship is normal but crowding, spacing, or rotations are present anteriorly — this is distinct from normal occlusion. All participants were informed of their voluntary participation and confidentiality by signing written informed consent before data collection commenced, and ethical approval was obtained.

DATA COLLECTION PROCEDURE

A pre-tested and well-structured questionnaire with 18 questions was used to collect data and measure oral hygiene practices and awareness among patients with malocclusion. The questionnaire contained questions about the daily oral hygiene practices, use of cleaning tools like toothpaste, interdental brushes and floss and awareness regarding the impact of malocclusion on the oral health. The questionnaire was given to patients visiting Tariq Dental Clinic and Bashir Dental Hospital in person. The participants were clearly instructed on how to fill in the form, and help was offered where necessary to make sure that they gave the right answers.

STATISTICAL ANALYSIS

Once the data collection was completed, all the responses were coded and put into the Statistical Package of the Social Sciences (SPSS) software version 29 to be analyzed. The data was summarized using descriptive statistical measures like frequency and percentage distribution to describe the data, including demographic factors like age and gender and oral hygiene practices and awareness levels among the study participants. The data analyzed were then interpreted to determine trends and associations of oral hygiene behavior and awareness of patients with malocclusion.

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RESULTS

This study included a total of 100 patients, 69 male and 31 female. Distribution of patients according to their age and gender is depicted in Table 1. 60% of people aged 20-26 years, 19% people aged 13-19 years, 11% people aged 27-33 years and 10 % people aged 34-40 years were participating in this study.

Most people clean their teeth (97%). All the people (93%) use toothbrushes or toothpaste for brushing, 7% use Datun, finger and charcoal powder. Tongue cleaning is an important aspect of cleaning the oral cavity. 74% of patients cleaned their tongue. Most people (46%) brush their teeth twice a day, 42% brush once a day, 8% brush more than twice a day, and 6% do not brush their teeth frequently. Most people visit a dentist if they face any dental issue (80%), 73% of people change their brush once in 3 months, 10% people change their brush once in 6 months, and 17% of people change their brush when it is useless. Most of the people (34%) use dental floss, but 25% of people did not use any type of interdental cleaning aids, and 79% of participants did not use tobacco products of any kind (Table 2).

84% participants were aware of malocclusion of teeth, and 85% people are confident about their smile. 74% of people were satisfied with the appearance of their teeth, but 26% were not. 16% of patients reported being bullied due to malocclusion. Most people (81%) are aware of the ill effects on oral cavities caused due to malocclusion, and 83% of people know the alignment of teeth would affect their mastication. Most of the people (76%) think malocclusion is caused due to external habits. Additionally, 80% of patients reported having difficulty maintaining oral hygiene because of their malocclusion, highlighting the practical impact of the condition on daily self-care. Approximately 86% of respondents desired to correct their malocclusion after learning about its negative consequences, while 14% were opposed to doing so. Class I (Angle Class I: normal molar relation with anterior irregularities) sagittal molar occlusion was found in 44% of the sample, while Class II (disocclusion) and Class III (mesiocclusion) were found in 40% and 16% of the sample, respectively (Table no. 3).

Table 1: Demographic Characteristics of the Respondents (n = 100)

Demographic Characteristics		Frequency	Percentage (%)
Age	13-19	19	19.0%
	20-26	60	60.0%
	27-33	11	11.0%
	34-40	10	10.0%
Gender	Male	69	69.0%
	Female	31	31.0%

Table 2: Responses of the Respondents about Oral Hygiene Practice

Characteristics		Frequency	Percentage (%)
Do you clean your teeth?	Yes	97	97.0%
	No	3	3.0%
How do you clean your teeth?	Toothbrush or toothpaste	93	93.0%
	Other (Datun, Finger, Charcoal powder)	7	7.0%
Do you clean your tongue?	Yes	74	74.0%
	No	26	26.0%
	Once	42	42.0%

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How often do you brush your teeth every day?	Twice	46	46.0%
	More than twice	8	8.0%
	Sometimes	6	6.0%
	Only in the problem	80	80.0%
How often do you visit a dentist?	Once in 6 months	17	17.0%
	Once in 3 months	3	3.0%
	Once in 3 months	73	73.0%
Frequency of changing toothbrushes	Once in 6 months	10	10.0%
	When useless	17	17.0%
	Floss	34	34.0%
Use of interdental cleaning aids	Interdental brush	18	18.0%
	Wooden Toothpicks	23	23.0%
	None	25	25.0%
Do you use tobacco?	Yes	21	21.0%
	No	79	79.0%

Table 3: Responses of Respondents about Malocclusion Awareness

Characteristics		Frequency	Percentage
Have you heard the term Malalignment of teeth?	Yes	84	84.0%
	No	16	16.0%
Are you confident about your smile?	Yes	85	85.0%
	No	15	15.0%
Are you pleased with the appearance of your teeth?	Yes	74	74.0%
	No	26	26.0%
Have you ever been bullied due to malocclusion?	Yes	16	16.0%
	No	84	84.0%
Do you know the adverse effects on oral health caused by by malocclusion?	Yes	81	81.0%
	No	19	19.0%
Do you think improper alignment of teeth would affect mastication (Chewing problem)?	Yes	83	83.0%
	No	17	17.0%
Do you think Malalignment is caused due to external habits (Thumb sucking, Lip biting and Tongue thrusting)?	Yes	76	76.0%
	No	24	24.0%
Are you having difficulty maintaining oral hygiene because of malocclusion?	Yes	80	80.0%
	No	20	20.0%
Will you get your malocclusion corrected after learning about its negative consequences?	Yes	86	86.0%
	No	14	14.0%
Occlusal sagittal Molar relationship	Class I	44	44.0%
	Class II	40	40.0%
	Class III	16	16.0%

DISCUSSION

Pakistan, a developing country, faces numerous challenges in providing oral health services. Understanding the distribution and frequency of oral health issues, as well as the dental hygiene habits of individuals, is essential. Such data is essential for developing oral health policies and suitable initiatives, raising public awareness and understanding of the preventative and

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promotional aspects of oral health, developing the services that are needed, and educating the dental workforce that is needed to satisfy these demands [14]. Oral health has been severely neglected as a result of a lack of knowledge regarding dental conditions. Doctors and health workers at the grassroots level lack sufficient understanding of how to prevent orodental issues. The poor oral health of our population is a result of all the above-mentioned problems [15]. Malocclusion is the second most common dental disorder in children and young adults, after tooth caries. Ankur G Shah (2017) conducted a study, Assessment of Oral Hygiene Awareness, Oral Health Practices, and Dental Health Issues among Indian Undergraduate Medical Students. It was shown that 74.5% of students only brushed once a day, but 79.1% of students thought their dental hygiene was "Good." 71.9% of students did not use any interdental cleaning products, and only 23.5% of students used fluoridated toothpaste; 47.4% of participants had never been to the dentist; 20.9% of students reported having a toothache in the previous 12 months; and all students used toothpaste and a toothbrush, with 44.9% using a soft-bristled toothbrush and 70.4% changing their toothbrush every three months [15]. According to our study, most people clean their teeth using a toothbrush or toothpaste for brushing. Tongue cleaning is an important aspect of cleaning the oral cavity. 74% of patients cleaned their tongue. Most patients brush their teeth twice a day, but some patients do not brush their teeth frequently. 34% use dental floss, but 25% of people did not use any type of interdental cleaning aids [16]. 79% of the participants did not use any type of tobacco. 84% of participants were aware of malocclusion of teeth, and 85% were confident about their smile. Most of the patients were happy with the appearance of their teeth; however, 16% reported being bullied due to their malocclusion, and the majority were also aware of the negative effects on the oral cavity caused by malocclusion. A notable finding was that 80% of patients reported difficulty maintaining oral hygiene due to their malocclusion — a clinically important result that underscores the need for targeted oral hygiene instruction in this population. Furthermore, 80% of patients reported visiting a dentist only when they had a problem, reflecting a predominantly reactive rather than preventive approach to dental care. This is a significant public health concern, as regular dental check-ups are essential for early detection and management of both malocclusion and associated oral health issues. About 86% of the people wanted to correct their malocclusion after knowing its ill effects. It has been discovered that teens place a high value on having aesthetically pleasing teeth and have demonstrated the development of oral perceptual awareness [16]. Concern over appearance and face attractiveness develops during adolescence, which results in a greater awareness of body image. Therefore, one crucial factor in treatment planning for teenage populations is the self-perception of malocclusion.

LIMITATION AND FUTURE RECOMMENDATIONS

This study had certain limitations, as it was observational in nature and conducted within a limited time frame, with unequal sample size distribution between male and female participants. It is recommended that future studies include a larger and more diverse sample size to better identify variations and gaps in oral hygiene awareness among malocclusion patients. Further research should also focus on educating patients through dentists about proper brushing techniques, regular flossing, the use of interdental brushes, and the importance of routine dental check-ups. Additionally, similar studies should be conducted in other areas of Islamabad to obtain more comprehensive and generalizable results.

CONCLUSION

The findings of this study highlight both strengths and gaps in oral hygiene awareness and practice among malocclusion patients attending dental clinics in Bhara Kahu. While the majority of patients demonstrated basic oral hygiene practices such as regular toothbrushing and tongue cleaning, significant areas of concern were identified. Only 34% used dental floss and 80% of patients visited a dentist only reactively, suggesting that preventive dental care remains underutilised in this population. The high prevalence of Class II malocclusion (40%) — which exceeds typical global estimates of 20–25% — warrants further investigation in local Pakistani populations. Critically, 80% of patients reported difficulty maintaining oral hygiene due to their malocclusion, reinforcing the clinical need for targeted oral hygiene instruction as part of orthodontic management. These findings underscore the importance of integrating patient education on brushing technique, interdental cleaning, and routine dental visits into routine clinical practice. Public health programmes should focus on improving preventive dental awareness, particularly among adolescents and young adults in peri-urban communities of Pakistan.

Volume 7, Issue 1, 2026 | https://doi.org/10.53576/bashir.007.01.0263

DECLARATIONS

Ethical approval: Ethical approval of this study was obtained from Bashir institute of Health sciences (IRB/BIHS/2025-VI-02) before start of this study.

Availability of data and materials: The data used and/or analyzed during the current study are available from the corresponding author on reasonable request.

AUTHORS' CONTRIBUTIONS

MK and SA contributed to study conception and design. MIS and SU participated in data collection. MAY performed statistical analysis. All authors contributed to interpretation of results and manuscript drafting. All authors reviewed and approved the final manuscript.

Competing interests: Neither of the authors has any conflict of interest to disclose

Funding: Not applicable.

Use of AI statement: No artificial intelligence tools were used in the preparation of this manuscript. All research, writing, and data analysis are solely the work of the author(s).

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