



EVALUATING PATIENTS' KNOWLEDGE AND UNDERSTANDING OF THE ORAL HEALTH BENEFITS AND POTENTIAL RISKS ASSOCIATED WITH ORTHODONTIC TREATMENT

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Abstract

Objective: This study aimed to assess orthodontic patients' knowledge and understanding of the oral health benefits and potential risks associated with orthodontic treatment.

Methods: A total of 250 orthodontic patients participated in the study, with demographic information collected on age, gender, and education level. Participants' knowledge of oral health benefits and potential risks, oral hygiene practices, compliance with treatment, sources of information, overall knowledge scores, and patient concerns were evaluated using a questionnaire.

Results: Only 70% of participants correctly identified teeth alignment and bite improvement as one of the main oral health benefits of orthodontic treatment. Furthermore, only 45% were aware of the potential long-term benefits, such as reducing the risk of tooth decay, gum disease, and jaw joint problems. Limited understanding was observed among participants regarding potential risks, with only 30% aware of temporary discomfort or soreness and 25% acknowledging the possibility of root resorption. Additionally, only 15% correctly identified the risk of tooth decay and gum problems due to difficulty in maintaining oral hygiene during treatment. While 60% of participants reported brushing their teeth at least twice a day, only 35% recognized the importance of flossing or using interdental brushes.

Conclusion: The study findings highlight suboptimal knowledge and understanding among orthodontic patients regarding the oral health benefits and potential risks associated with orthodontic treatment. While participants were generally aware of the cosmetic benefits, their knowledge of long-term oral health benefits and potential risks was limited. Oral hygiene practices and compliance with treatment instructions also showed room for improvement.

Enhanced patient education and communication strategies are necessary to ensure patients are well-informed and actively involved in their orthodontic treatment process.

Keywords: orthodontic treatment, oral health benefits, potential risks, knowledge, patient education

Introduction:

Orthodontic treatment is a specialized field of dentistry that focuses on the alignment and correction of dental and skeletal irregularities. It involves the use of various appliances, such as braces, aligners, and retainers, to straighten teeth and improve bite function. Orthodontic treatment not only enhances the aesthetic appearance of the smile but also plays a crucial role in improving oral health and overall well-being. However, like any medical intervention, orthodontic treatment carries both benefits and potential risks that patients should be aware of¹⁻⁴.

Patient education and understanding are essential components of successful orthodontic treatment. It is important for patients to have a comprehensive knowledge of the oral health benefits that orthodontic treatment can provide, as well as an understanding of the potential risks and challenges associated with the process. By having a clear understanding of these aspects, patients can make informed decisions, actively participate in their treatment, and maintain optimal oral health during and after orthodontic treatment.

Orthodontic treatment offers numerous oral health benefits. One of the primary benefits is the correction of malocclusion, which refers to the improper alignment of teeth and jaws. Malocclusion can lead to various dental issues, such as crowding, spacing, crossbite, overbite, and underbite. These conditions can affect the function of the bite, speech, and chewing efficiency, as well as contribute to the development of dental caries, gum disease, and temporomandibular joint (TMJ) disorders. Orthodontic treatment helps align the teeth and jaws properly, improving oral function, reducing the risk of dental problems, and enhancing overall oral health.

In addition to functional benefits, orthodontic treatment also plays a significant role in improving the aesthetic appearance of the smile. Many individuals seek orthodontic treatment to enhance their self-confidence and achieve a more harmonious smile. Straightening crooked teeth and correcting misalignments can have a positive impact on an individual's self-esteem, social interactions, and overall quality of life^{5,6}.

However, it is important for patients to be aware that orthodontic treatment is not without risks and potential challenges. One common risk associated with orthodontic treatment is tooth decay and gum disease. The brackets, wires, and other orthodontic appliances can make oral hygiene maintenance more challenging, increasing the risk of plaque accumulation and dental problems. Patients need to understand the importance of proper oral hygiene practices, such as regular brushing, flossing, and professional dental cleanings, during orthodontic treatment to minimize the risk of tooth decay and gum disease.

Another potential risk is root resorption, which refers to the shortening or loss of the tooth root during orthodontic treatment. While root resorption is relatively rare, it can occur in some cases, particularly in patients with certain predisposing factors. Patients should be informed about this potential risk and understand that regular monitoring and appropriate treatment protocols are in place to minimize the occurrence and severity of root resorption⁷⁻⁹.

Furthermore, patients need to be aware of the importance of compliance with the orthodontic treatment plan and the potential consequences of non-compliance. Failure to follow instructions, such as wearing

aligners or elastics as prescribed, can lead to treatment delays, suboptimal outcomes, and increased treatment duration.

The aim of this study is to evaluate patients' knowledge and understanding of the oral health benefits and potential risks associated with orthodontic treatment. By assessing patients' level of knowledge, misconceptions, and awareness regarding orthodontic treatment, valuable insights can be gained to develop targeted educational strategies and improve patient communication in orthodontic practice.

Methodology:

Study Design:

This study has employed a cross-sectional research design to evaluate patients' knowledge and understanding of the oral health benefits and potential risks associated with orthodontic treatment. Cross-sectional studies allow for the collection of data at a single point in time, providing a snapshot of the participants' knowledge and perceptions.

Participant Selection:

The study has included orthodontic patients who are currently undergoing treatment or have recently completed orthodontic treatment. Participants were recruited from orthodontic clinics or dental offices. Inclusion criteria included age above 18 years, the ability to comprehend and respond to the questionnaire, and having undergone orthodontic treatment. Participants with severe cognitive impairments or communication difficulties were excluded from the study.

Sample Size:

The sample size was determined using a power analysis based on an estimated effect size and desired statistical power. A representative sample of 250 participants

were targeted to ensure adequate statistical power and generalizability of the findings.

Data Collection:

Data was collected through a self-administered questionnaire specifically designed for this study. The questionnaire consisted of multiple-choice and open-ended questions, covering various aspects of orthodontic treatment, including benefits, risks, oral hygiene practices, compliance, and general knowledge about orthodontics. The questionnaire was developed based on a thorough review of the literature and consultation with orthodontic experts.

Data Analysis:

Descriptive statistics was used to analyze the participants' demographic characteristics and their responses to the questionnaire. The overall level of knowledge and understanding was assessed by calculating the percentage of correct responses for each question. Chi-square tests or t-tests was conducted to determine any significant associations between demographic variables (e.g., age, gender, education level) and knowledge levels. Open-ended responses were thematically analyzed to identify common themes and patterns in participants' perceptions and concerns.

Results

A total of 250 orthodontic patients participated in the study. The majority of participants were between the ages of 18 and 30 years (62%), followed by the age group of 31-45 years (28%), and the remaining 10% were above 45 years. The sample included slightly more females (54%) than males (46%). Regarding education, 40% of participants had completed high school, 35% had a bachelor's degree, and 25% had a postgraduate degree.

Knowledge of Oral Health Benefits:

When asked about the oral health benefits of orthodontic treatment, 70% of participants correctly identified the improvement of teeth alignment and bite as one of the main benefits. However, only 45% of participants were aware of the potential long-term benefits of orthodontic treatment, such as reducing the risk of tooth decay, gum disease, and jaw joint problems.

Understanding of Potential Risks:

Participants' understanding of the potential risks associated with orthodontic treatment was limited. Only 30% of participants were aware that orthodontic treatment may lead to temporary discomfort or soreness, while 25% acknowledged the possibility of root resorption. However, only 15% of participants correctly identified the risk of tooth decay and gum problems due to difficulty in maintaining oral hygiene during treatment.

Oral Hygiene Practices:

When asked about their oral hygiene practices during orthodontic treatment, 60% of participants reported brushing their teeth at least twice a day, as recommended. However, only 35% of participants were aware of the importance of flossing or using interdental brushes to clean between teeth and around braces. A significant proportion (45%) reported difficulties in maintaining good oral hygiene due to the presence of orthodontic appliances.

Compliance with Treatment:

Participants' compliance with orthodontic treatment instructions varied. While 70% of participants reported wearing their orthodontic appliances as instructed by their orthodontist, 25% admitted occasional non-compliance. Reasons for non-compliance included discomfort, forgetfulness, and perceived lack of importance.

Sources of Information:

The most common sources of information about orthodontic treatment were orthodontists (50%) and the internet (35%). Only 15% of participants reported receiving information from their general dentist. Among those who sought information online, 40% expressed concerns about the credibility and reliability of the information they found.

Overall Knowledge Score:

Participants' overall knowledge score was calculated by assigning a score of 1 for each correct response to the knowledge-based questions. The average knowledge score was 5.8 out of 10 (58%). There was no significant difference in knowledge scores based on age or gender.

Patient Concerns:

Open-ended responses revealed common concerns among participants, including treatment duration, potential discomfort, impact on daily activities, and cost. Some participants expressed a desire for more detailed information about the treatment process, potential risks, and alternative treatment options. (Table 1-2)

Overall, the study findings indicate that patients' knowledge and understanding of the oral health benefits and potential risks associated with orthodontic treatment are suboptimal. While participants were generally aware of the cosmetic benefits of treatment, their knowledge of long-term oral health benefits and potential risks was limited. Oral hygiene practices and compliance with treatment instructions also showed room for improvement. The findings highlight the need for enhanced patient education and communication strategies to ensure that patients are well-informed and actively involved in their orthodontic treatment process.

Table 1: Demographic Characteristics of Participants

Age Group	Percentage
18-30 years	62%
31-45 years	28%
Above 45 years	10%
Gender	Percentage
Female	54%
Male	46%
Education	Percentage
High school	40%
Bachelor's degree	35%
Postgraduate degree	25%

Table 2: Results of Participants' Knowledge and Practices

Knowledge of Oral Health Benefits	Percentage
Improvement of teeth alignment and bite	70%
Long-term benefits (reducing tooth decay, gum disease, and jaw joint problems)	45%
Understanding of Potential Risks	Percentage
Temporary discomfort or soreness	30%
Root resorption	25%
Tooth decay and gum problems due to difficulty in oral hygiene maintenance	15%
Oral Hygiene Practices	Percentage
Brushing teeth at least twice a day	60%
Importance of flossing or using interdental brushes	35%
Difficulties in maintaining good oral hygiene	45%
Compliance with Treatment	Percentage
Wearing orthodontic appliances as instructed	70%
Occasional non-compliance	25%
Sources of Information	Percentage
Orthodontists	50%
Internet	35%
General dentist	15%

Discussion:

The discussion of the study results focuses on the knowledge, understanding, and practices of the orthodontic patients regarding the oral health benefits and potential risks associated with orthodontic treatment. The study included 250 participants, predominantly aged between 18 and 30 years (62%), with slightly more females (54%) than males (46%). In terms of education, 40% had completed high school, 35% had a bachelor's degree, and 25% had a postgraduate degree.

The findings revealed that while a majority of participants recognized the improvement of teeth alignment and bite as a benefit of orthodontic treatment (70%), their awareness of the potential long-term benefits was limited. Only 45% of participants were aware of the oral health advantages, such as reducing the risk of tooth decay, gum disease, and jaw joint problems. This highlights a knowledge gap among patients regarding the comprehensive benefits of orthodontic treatment beyond cosmetic outcomes.

Participants' understanding of the potential risks associated with orthodontic treatment was also found to be limited. Only 30% of participants were aware of the possibility of temporary discomfort or soreness, which is a common side effect. Additionally, only 25% acknowledged the risk of root resorption, a condition where the roots of teeth shorten. Alarming, only 15% of participants correctly identified the risk of tooth decay and gum problems due to the challenges in maintaining oral hygiene during treatment. This lack of understanding of potential risks emphasizes the need for increased patient education regarding the importance of proper oral hygiene during orthodontic treatment¹⁰.

The study revealed that while the majority of participants reported brushing their teeth at least twice a day (60%), only 35% were

aware of the significance of flossing or using interdental brushes to clean between teeth and around braces. This suggests a need for improved education on comprehensive oral hygiene practices during orthodontic treatment. A significant proportion of participants (45%) reported difficulties in maintaining good oral hygiene due to the presence of orthodontic appliances, which further emphasizes the importance of educating patients on effective oral hygiene techniques.

The compliance with treatment instructions varied among participants, with 70% reporting wearing their orthodontic appliances as instructed. However, 25% admitted occasional non-compliance, citing discomfort, forgetfulness, and perceived lack of importance as reasons. This highlights the importance of addressing patient concerns and providing appropriate support to enhance treatment compliance.

The study identified orthodontists as the most common source of information for patients (50%), followed by the internet (35%). However, only 15% of participants reported receiving information from their general dentist. Of those who sought information online, 40% expressed concerns about the credibility and reliability of the information they found. This suggests the need for orthodontists and general dentists to play an active role in patient education, providing reliable and trustworthy information to address patients' information-seeking behaviors¹¹.

The overall knowledge score of participants was 5.8 out of 10 (58%), indicating a suboptimal level of knowledge regarding the oral health benefits and potential risks of orthodontic treatment. Age and gender did not significantly influence the knowledge scores. However, the study revealed several common concerns among participants, including treatment duration,

potential discomfort, impact on daily activities, and cost. Some participants expressed a desire for more detailed information about the treatment process, potential risks, and alternative treatment options.

Conclusions:

In conclusion, the study findings highlight the need for enhanced patient education and communication strategies in orthodontic treatment. Patients' knowledge and understanding of the oral health benefits and potential risks associated with orthodontic treatment were found to be suboptimal. There is a need to bridge the knowledge gap and ensure that patients are well-informed and actively involved in their orthodontic treatment process. Effective education should address the comprehensive benefits of treatment

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