

# Evaluation of Knowledge and Attitude on Aligners among BDS Undergraduate Students among Dakshina Kannada Population - A Questionnaire Based Study

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**Abstract:** Clear aligners are gaining popularity as an alternative to traditional orthodontic treatments due to their aesthetic appeal and patient comfort. However, the awareness and knowledge about clear aligners among dental students remains limited. The objective of this questionnaire-based study was to assess the knowledge, awareness, and attitudes of Bachelor of Dental Surgery (BDS) undergraduate students regarding clear aligners. A total of 250 students participated in the study, spanning across various years of the BDS program. The results indicated that while the majority of students correctly understood the primary use of clear aligners (orthodontic correction), a significant gap exists in practical exposure, with many students lacking hands-on experience with aligner treatments. The study highlights the need for greater inclusion of clear aligner therapy in dental education to ensure that future dental professionals are adequately prepared for modern orthodontic treatments.

**Keywords:** Financial, Outcome, Allocation, Project, Activities.

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## I. INTRODUCTION

Orthodontics has evolved significantly in recent years, with the introduction of clear aligners offering a less conspicuous and more comfortable alternative to traditional metal braces<sup>1</sup>. Clear aligners are transparent, removable trays designed to straighten teeth gradually, using controlled pressure to move teeth into desired positions<sup>2</sup>. Among the most well-known brands, Invisalign® has become a widely recognized product that has contributed to the increasing acceptance of aligners as a viable treatment option for a variety of orthodontic cases<sup>3</sup>.

Despite the growing use of clear aligners in clinical practice, there is limited research on the awareness and understanding of these treatments among dental students. The rapid adoption of clear aligners in clinical practice presents a unique opportunity for dental students to gain exposure to these innovative orthodontic treatments. However, many BDS programs may not adequately address this emerging trend, potentially leaving students unprepared for clear aligner therapy in their future practices<sup>1</sup>.

The goal of this study was to assess the level of knowledge, attitudes, and awareness regarding clear aligners among BDS undergraduate students, with a focus on their understanding of the purpose, material, effectiveness, and limitations of clear aligners. Furthermore, this study explores the extent to which students feel that clear aligners should be included as part of their formal education in orthodontics.

### ➤ Aim of the Study:

The primary aim of this study was to evaluate the level of knowledge, awareness, and attitudes of BDS undergraduate students regarding clear aligners.

## II. RESULTS

A total of 250 students participated in this study. The breakdown of their year of study is as follows:

- 1st Year: 25% (50 students)
- 2nd Year: 25% (50 students)
- 3rd Year: 25% (50 students)
- 4th Year: 25% (50 students)

- Internship: 25% (50 students)

The distribution across various years of the Bachelor of Dental Surgery (BDS) program provides insights into the academic progression and exposure of students to orthodontic topics. Understanding the year-wise distribution helps in assessing the depth of knowledge and experience students have with clear aligners at different stages of their education.

### III. KNOWLEDGE-BASED QUESTIONS

#### ➤ Primary use of Clear Aligners:

Clear aligners are primarily designed for orthodontic correction, offering a discreet and comfortable alternative to traditional braces. Their effectiveness in treating mild to moderate dental misalignments has made them a popular choice among patients seeking aesthetic solutions.

The majority (88.2%) of respondents correctly identified clear aligners as primarily used for **orthodontic correction**. Only 4.2% incorrectly selected other options such as teeth whitening or TMJ disorder treatment.

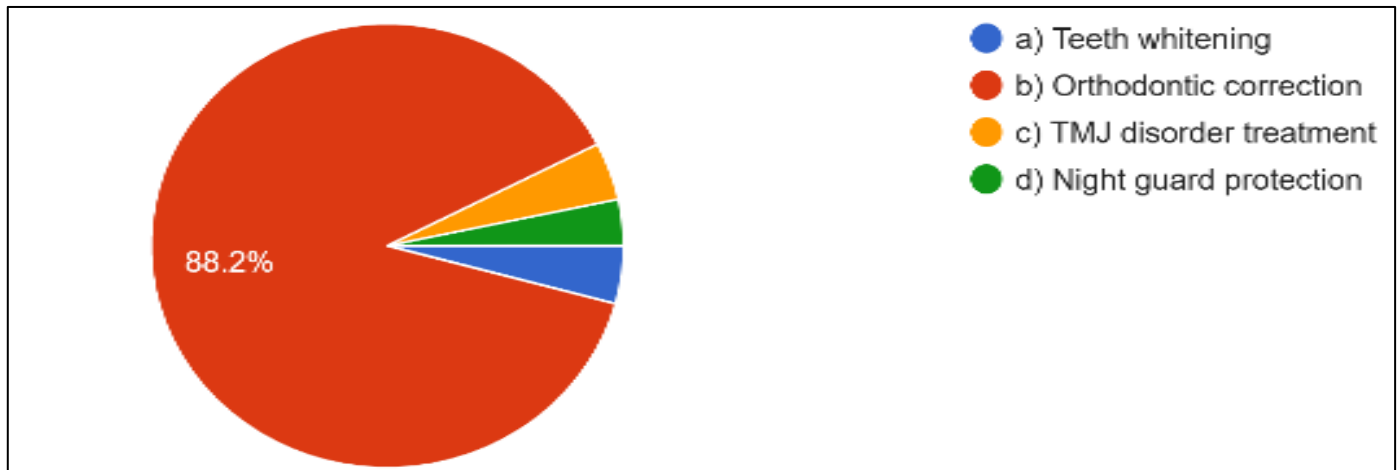


Fig 1 Knowledge-Based Question 3. What are clear Aligners Primarily used for?

#### ➤ Materials Used For Clear Aligners:

A significant proportion (59.6%) of students selected **polyurethane** as the material commonly used for making clear aligners. However, only 7.9% selected **acrylic**, which is also a widely used material, suggesting some confusion among students about aligner composition.

Polyurethane is widely used in the manufacturing of clear aligners due to its flexibility and durability. This material allows for the precise movement of teeth while ensuring comfort for the patient.

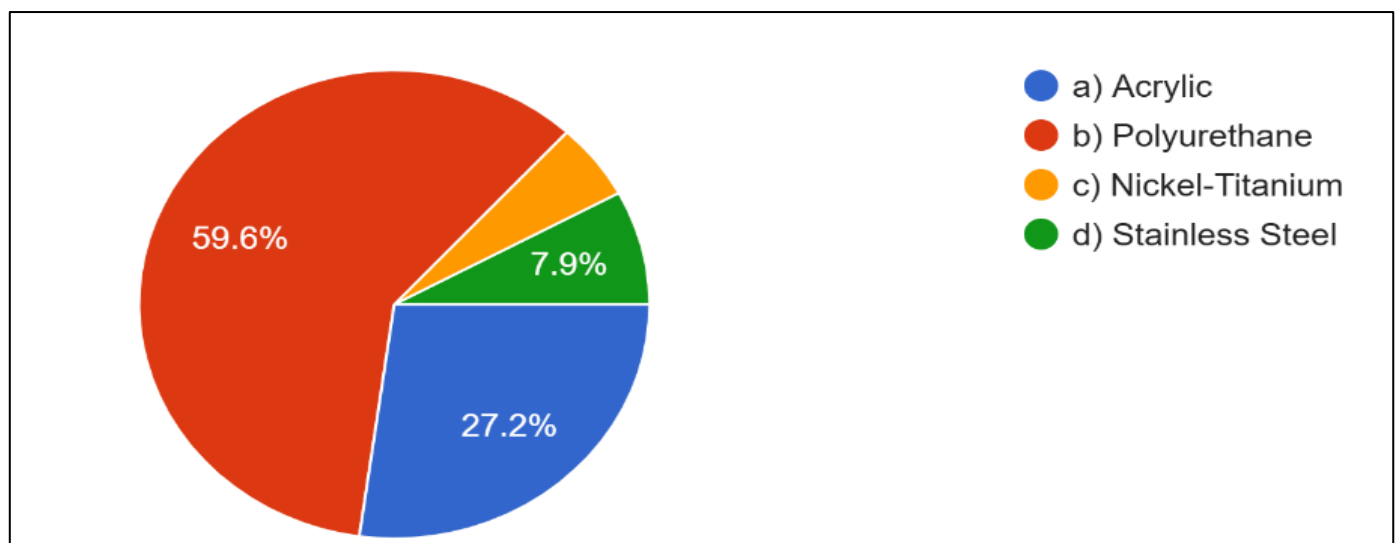


Fig 2 which of the Following is a commonly used Material for making clear Aligners?

Clear aligners function by applying gentle, constant pressure to teeth, gradually moving them into desired positions. This mechanism contrasts with traditional braces that use fixed brackets and wires, offering a more comfortable and aesthetically pleasing option for patients.

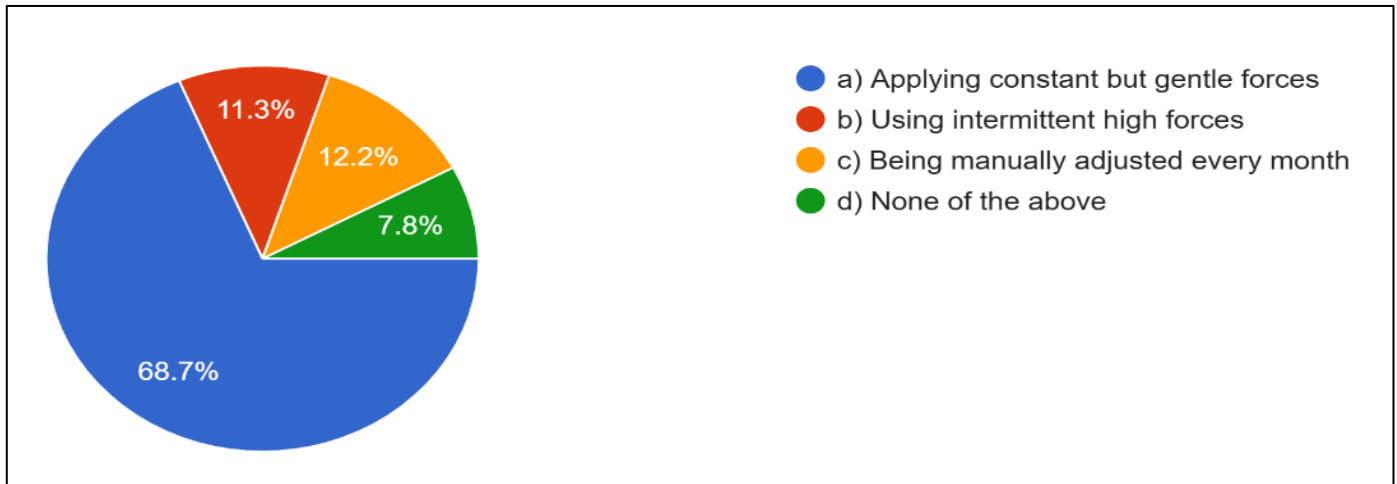


Fig 3 Compared to Traditional Braces, Aligners Work by:

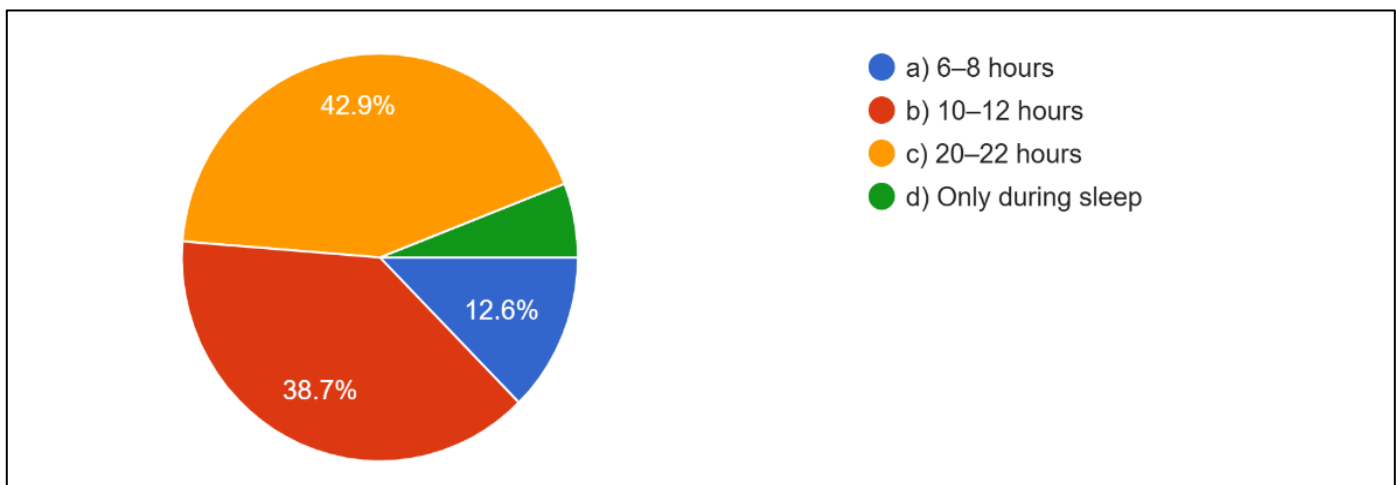


Fig 4 What is the Recommended daily Wear time for Aligners?

#### ➤ Daily Wear Time for Aligners

When asked about the recommended daily wear time for clear aligners, 38.7% of respondents correctly identified that aligners should be worn for **20–22 hours per day**. Only 12.6% suggested a daily wear time of **6–8 hours**, indicating a lack of understanding of the treatment's requirements.

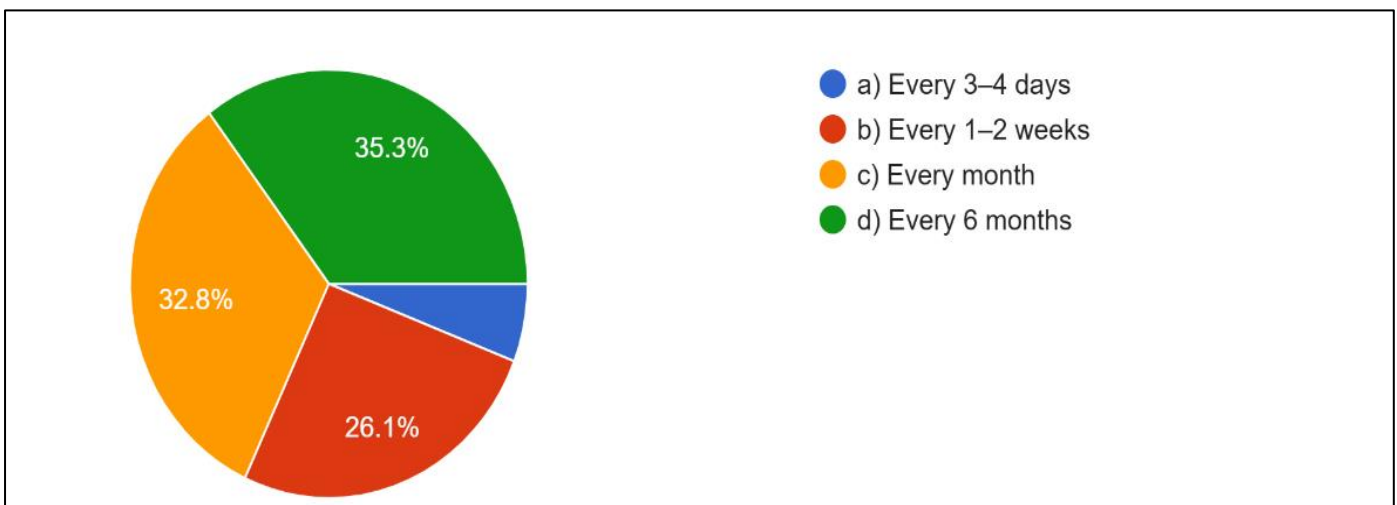


Fig 5 How Often Should A Patient Typically Change of the next Set of Aligners?

For optimal results, it's recommended that clear aligners be worn for 20–22 hours daily. This duration ensures continuous pressure on the teeth, facilitating effective movement and alignment.

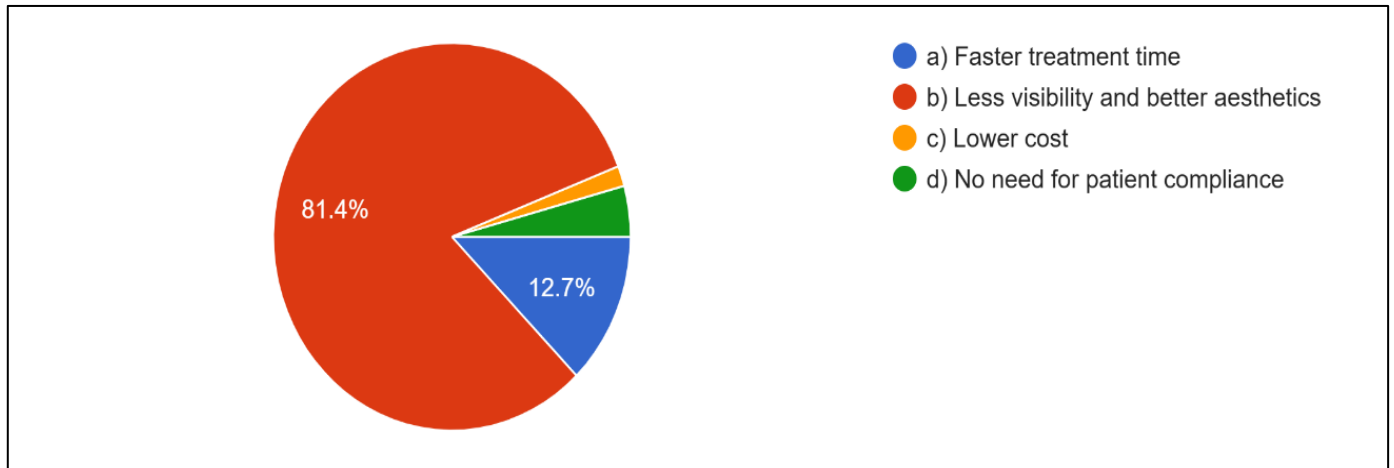


Fig 6 What Is The Major Advantage of Alingers over Traditinal Braces?

The primary advantage of clear aligners is their aesthetic appeal. Being transparent and removable, they offer a discreet treatment option without the dietary restrictions associated with traditional braces

➤ *Cases Not Ideal For Aligners:*

The majority (74.1%) correctly identified that **severe skeletal malocclusion** is not ideal for aligner treatment, which highlights their understanding of the limitations of aligners in complex cases.

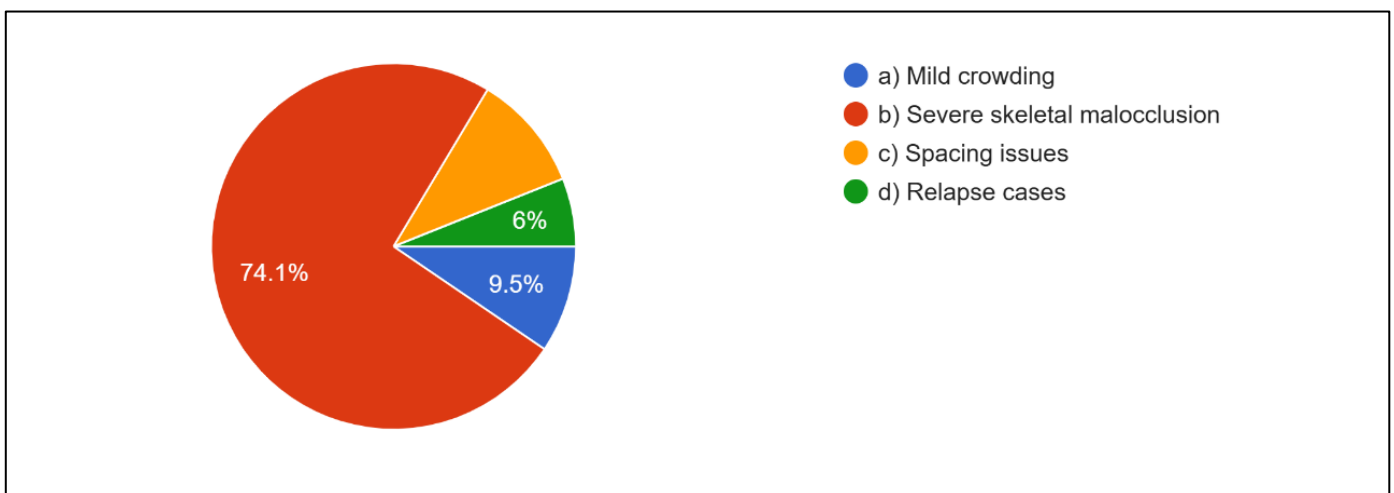


Fig 7 What Type of Cases Are NOT Ideal For Aligner Treatment?

➤ *Most Common Complication Associated with Aligners*

The most common issue reported with clear aligners is temporary speech disturbances during the initial days of use. These disturbances typically subside as patients adjust to the aligners

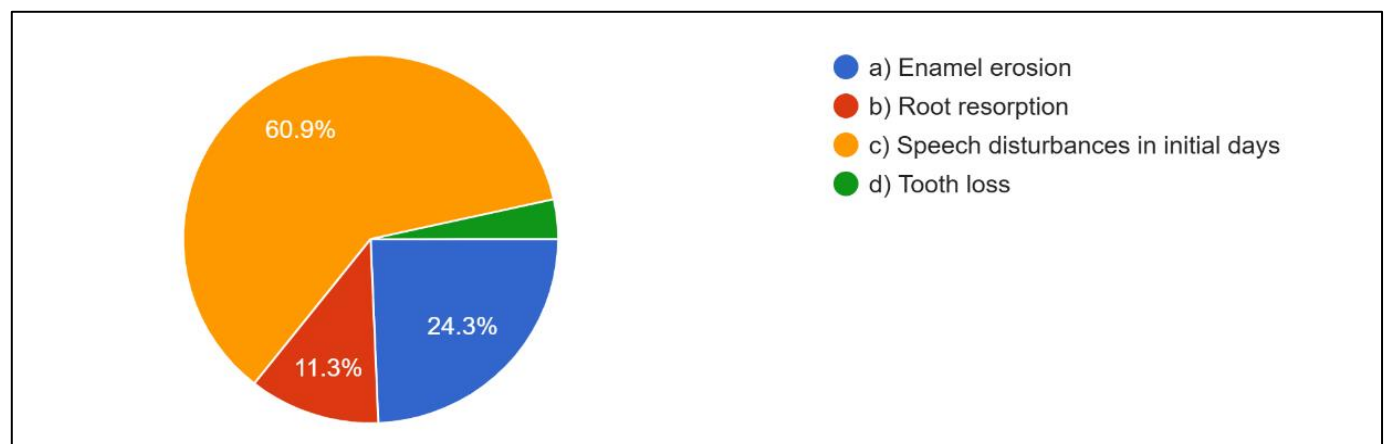


Fig 8 What Is The Most Common Complication Associated Whit Aligners?

❖ *Awareness and Attitudes*➤ *Effectiveness of Clear Aligners Compared To Traditional Braces*

Opinions vary regarding the effectiveness of clear aligners compared to traditional braces. While some believe aligners are equally effective, others remain uncertain, highlighting the need for further education on the subject.

➤ *Observation Or Assistance In Clear Aligner Treatment*

Hands-on experience with clear aligner treatments is limited among students, indicating a potential area for curriculum enhancement to include practical exposure to contemporary orthodontic techniques.

➤ *Inclusion of Clear Aligners In Undergraduate Training*

There is strong support for incorporating clear aligners into the undergraduate dental curriculum. This inclusion would ensure that future dental professionals are well-versed in modern orthodontic practices.

➤ *Consideration To Recommend Aligners To Future Patients*

Many students express a willingness to recommend clear aligners to future patients, contingent upon factors like cost and patient preference. This reflects an openness to adopting contemporary treatment options in clinical practice.

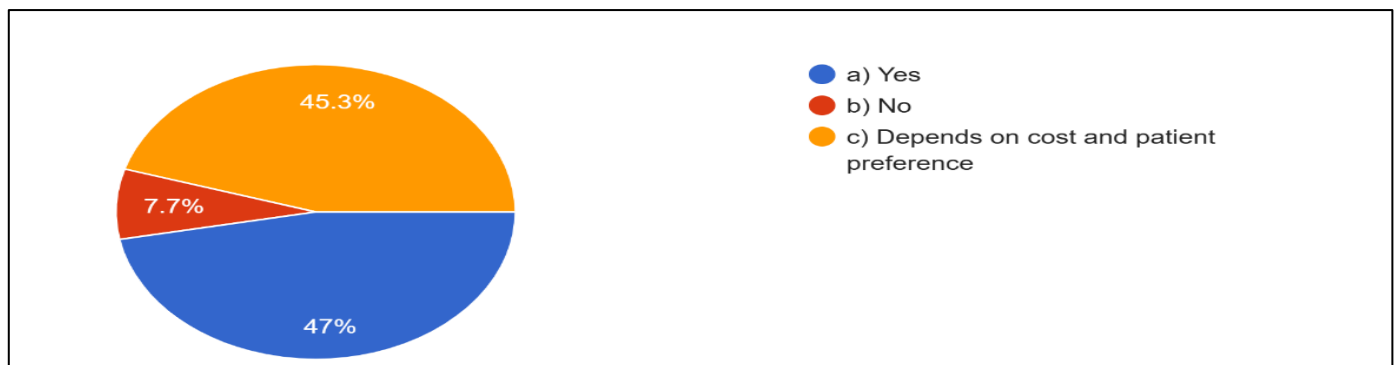


Fig 9 Would You Consider Recommending Aligners To Your Future Patients If They Are a Suitable?

#### IV. DISCUSSION

This study aimed to assess the level of knowledge, awareness, and attitudes regarding clear aligner therapy among undergraduate BDS students. The results revealed several key findings that highlight both strengths and gaps in student understanding, as well as the need for curriculum reform.

The majority of students (88.2%) correctly identified the primary purpose of clear aligners as orthodontic correction, which indicates a foundational awareness of aligners among BDS students. However, more nuanced knowledge showed inconsistencies. For instance, while 59.6% correctly identified polyurethane as a commonly used material in aligner fabrication, a significant number (27.2%) selected incorrect options like acrylic and stainless steel—materials not suitable for clear aligners due to their rigidity or lack of transparency. This indicates a superficial understanding of the materials used and suggests that the topic is either underemphasized or inconsistently taught in preclinical training.

A significant gap was observed in understanding the biomechanics of aligners. Only 68.7% correctly answered that aligners work by applying constant but gentle forces, which is a fundamental principle in aligner-based orthodontic treatment. Misconceptions like associating aligners with intermittent or manually adjusted forces reflect a confusion with how traditional fixed appliances function. This underlines a need for more focused teaching on the mechanics and force application principles unique to aligners.

The recommended daily wear time is another critical clinical detail, with 42.9% answering correctly (20–22 hours). Yet, nearly 60% selected incorrect wear durations, with 38.7% indicating 10–12 hours, and others suggesting wear only during sleep. This is a serious concern, as suboptimal wear time directly compromises treatment outcomes<sup>4</sup>. Similarly, only one-third of students knew the recommended frequency for switching aligners (1–2 weeks), which reflects limited familiarity with treatment protocols.

Students demonstrated a reasonably good understanding of the limitations of aligners, as 74.1% correctly identified that severe skeletal malocclusions are not ideal for clear aligner treatment. This suggests that while basic knowledge of aligner indications exists, students may still lack experience in differentiating cases based on complexity and skeletal involvement—skills typically gained through clinical exposure.

There was a realistic perception of the effectiveness of aligners: only 36.5% believed that aligners are as effective as braces for all cases, while a significant proportion were either unsure (35.7%) or disagreed (27.8%). This aligns with clinical literature that suggests aligners are highly effective in mild to moderate cases, but may be less effective in managing complex tooth movements such as extrusion, severe rotations, or large space closures without auxiliary aids<sup>5</sup>.

One of the most notable findings is the lack of exposure to aligner-related education, with 77.3% of students having never attended a lecture, seminar, or workshop on the subject, and only 27.8% having observed or assisted in a case.

involving aligners. This lack of hands-on or theoretical exposure is likely a contributing factor to the inconsistencies seen in responses across knowledge-based questions.

Despite this, students showed a proactive attitude toward learning: 72.6% felt aligners should be included as a mandatory topic in undergraduate orthodontic education, and over 90% were open to recommending aligners, either unconditionally or based on patient cost preference. This demonstrates a positive attitude towards adopting new technology in practice, but also a reliance on cost and patient preference as deciding factors—highlighting how economic considerations weigh heavily in treatment planning <sup>6</sup>.

When asked about perceived barriers to aligner therapy, cost emerged as the most commonly cited factor, followed by patient compliance and availability. This reflects global trends; aligner systems like Invisalign are often more expensive than conventional braces, limiting their accessibility in lower socioeconomic settings <sup>7</sup> Additionally, since aligners require strict compliance from patients, particularly in wear time, this presents a psychological and behavioural barrier to effectiveness, particularly in adolescents.

The results clearly highlight a need to restructure orthodontic education within undergraduate programs. With the growing global demand for aesthetic orthodontic options, future dental practitioners must be equipped not only with theoretical knowledge but also with practical skills related to modern appliances like aligners. Including hands-on workshops, simulation-based learning, and clinical exposure to aligner treatment cases could bridge the gap between emerging technologies and undergraduate competency.

These findings are consistent with studies conducted in other regions. For example, a study by Alansari et al. (2020) in Saudi Arabia showed that although students were aware of aligners, they lacked detailed knowledge, and exposure to practical cases was minimal <sup>8</sup>. Another study from India found that nearly 65% of dental students felt underprepared to discuss aligner therapy with patients, reinforcing the trend observed in this survey <sup>9</sup>.

## V. CONCLUSION

This study provides valuable insights into the knowledge and awareness of clear aligners among BDS undergraduate students. While the majority of students demonstrated a fundamental understanding of clear aligners' purpose, material composition, and treatment dynamics, there remains a significant gap in their exposure to practical aligner treatment. The findings suggest that dental schools should integrate clear aligner education into their curricula to ensure that students are adequately prepared to manage modern orthodontic treatment options. Further research should focus on evaluating the effectiveness of such curriculum changes and their impact on clinical competence.

## RECOMMENDATIONS

- BDS programs should consider implementing mandatory workshops or seminars dedicated to clear aligners.
- Future studies should explore the long-term effects of clear aligner education on student confidence and clinical practice.

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