

Knowledge, attitude, and awareness regarding the use of composites for orthodontic purposes among dental students

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J. Adv. Pharm. Technol. Res.

ABSTRACT

The aim of the study was to determine the knowledge, attitude, and practice regarding the use of composites for orthodontic purposes among dental students. The questionnaire was designed to evaluate knowledge, attitude, and awareness. Google Forms was used for the distribution of questions. This is a questionnaire survey based on knowledge, attitude, and awareness regarding the use of composites for orthodontic purposes among dental students; 86% of them had awareness regarding the use of composites for orthodontic purposes, wherein the remaining 14% were not aware. Considering the limitations of the study groups, we can conclude that the knowledge, attitude, and awareness regarding the use of composites for orthodontic purposes among dental students were good. However, there is still a lack of knowledge in few perspectives which can be overcome with continuous dental education programs and lectures

Key words: Dental composites, orthodontic adhesives, orthodontic bonding, orthodontic braces, orthodontic tooth movement

INTRODUCTION

Acid-etch bonding procedure was established by Buonocore. Since 1955, layering different resins to enamel surfaces has been tried and all of these have led to the direct bonding of orthodontic brackets with composite resins.^[1] Orthodontic bonding with composite resin has several positive points such as removal of pretreatment debonding and reducing gingival inflammation.^[2] Orthodontic bonding systems such as Transbond XT, flowable composites can be delivered to

denatured enamel without using bonding resins considering their improved flowability.^[3,4]

Reducing steps in bonding procedures, saving time during bond-ups, and reduction in potential errors can be eliminated by good moisture control through the bonding procedure.^[5] When the fluid monomers of the material infiltrate into the porous enamel and are polymerized, a micromechanical bond is achieved between the resin and tooth surface, the same as the one between the resin and the orthodontic bracket.^[6,7] The most frequently used adhesives to bond brackets to teeth are composite resins, glass-ionomer cements, and resin-modified glass-ionomer cements.^[8] Recently, resin composites have gained more popularity among practitioners due to improved physicomechanical properties and handling characteristics.^[9] In direct bonding procedures, the composite is filled and hardened beneath

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Submitted: 26-Apr-2022

Revised: 20-Jul-2022

Accepted: 21-Jul-2022

Published: 30-Dec-2022

Access this article online

Quick Response Code:



Website:

www.japtr.org

DOI:

10.4103/japtr.japtr_240_22

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How to cite this article: Dhanasekaran L, Balakrishnan N, Arvind TR. Knowledge, attitude, and awareness regarding the use of composites for orthodontic purposes among dental students. *J Adv Pharm Technol Res* 2022;13:S470-4.

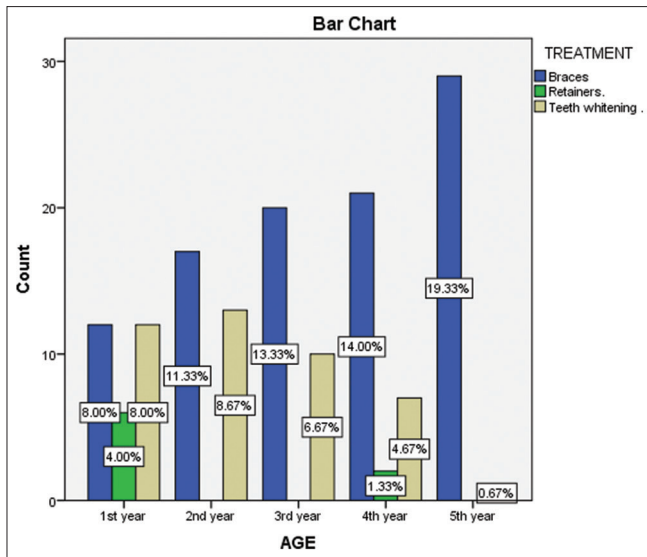


Figure 1: Represents association between study year and number of responses. X-axis depicts the participant’s study year and Y-axis depicts the frequency of responses in relation to treatments in which composites are used in orthodontic purposes. Blue denotes braces, green denotes retainers, and gray denotes teeth whitening. The standard deviation of this graph is 1.78. The Pearson correlation test shows the correlation to be 0.000

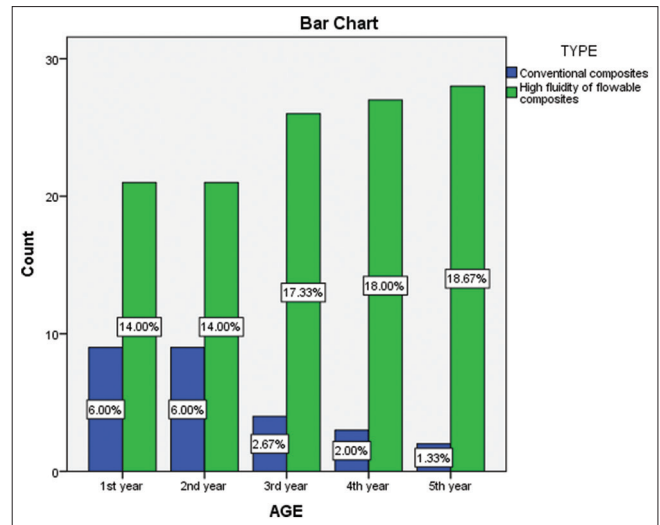


Figure 2: Represents the association between years of study and number of responses. X-axis depicts the year of the study participant and Y-axis depicts the frequency of responses in relation to the type of composites used in orthodontic purposes. Blue denotes conventional composite and green denotes high fluidity of flowable composite. The standard deviation of this graph is 1.65. The Pearson correlation test established a correlation at 0.037

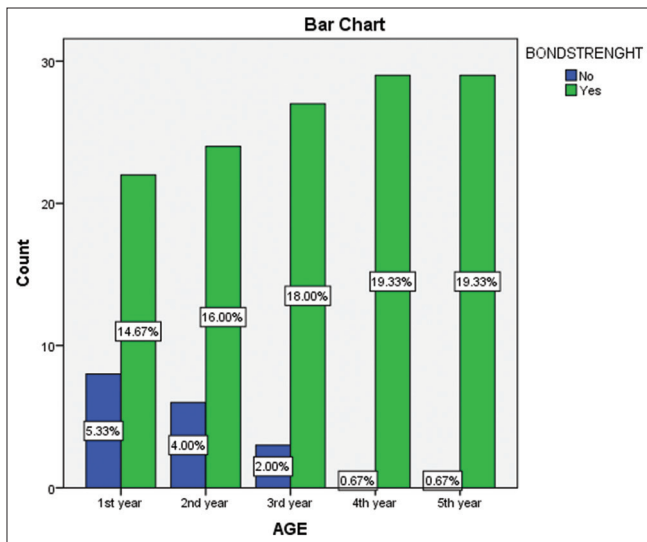


Figure 3: Represents the association between study year and number of responses. X-axis represents the year of the study participant and Y-axis represents the frequency of responses in relation to awareness if they knew bond strength should be sufficient to withstand the forces of mastication and stresses exerted by the archwires. Blue denotes no awareness among dental students and green denotes awareness among dental students. The standard deviation of this graph is 1.82. The Pearson correlation test shows $P = 0.020$

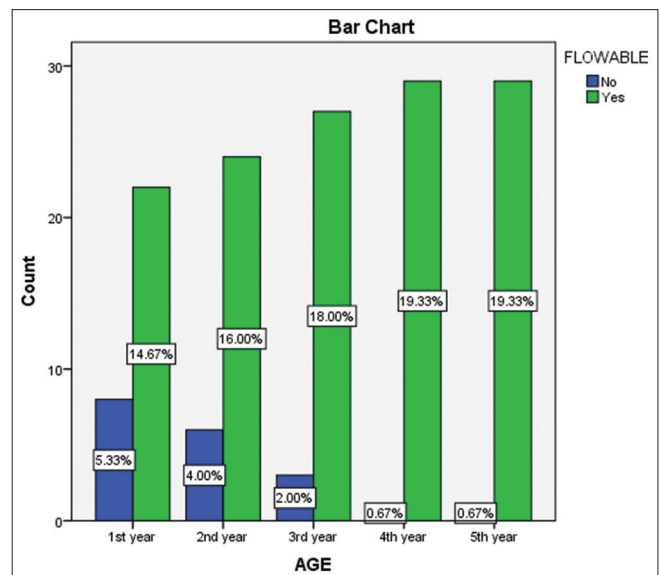


Figure 4: Represents the association between years of study and number of responses. X-axis depicts the year of the study participant and Y-axis depicts the frequency of responses in relation to awareness if they knew flowable composites and orthodontic composites have the same SBS and ARI. Blue denotes no awareness among dental students and green denotes awareness among dental students. The standard deviation of this graph is 1.23. The Pearson correlation test shows $P = 0.020$. SBS: Shear bond strength, ARI: Adhesive remnant index

metal or ceramic brackets by directly illuminating the bracket from different sides and by transillumination.^[10,11]

The dental composites currently available allow different types of activation: light cured, chemically cured, or dual

cured.^[12,13] Since the tooth structure has the ability to transmit visible light, the administration of visible light acts as a command set for the onset of the polymerization, resulting in enough working time, permitting the clinician to place the brackets properly, and remove the excess on time.^[14] In any

case, bond failure must be addressed clinically depending on the failure rates.^[15] Our research and knowledge have resulted in high-quality publications from our team.^[16-24]

The aim of the study was to determine the knowledge, attitude, and practice regarding the use of composites for orthodontic purposes among dental students.

MATERIALS AND METHODS

This is a questionnaire survey conducted among 150 dental students in which 30 participants were taken from each year of study. This survey was accepted by the Institutional Review Board, Saveetha Dental College and Hospitals. This consisted of 12 self-administered questions and Google Forms was used to conduct the survey among dental students that consist of both genders between the ages of 18–25 years. The results were collected and tabulated (7/11, 8:34 AM) Nivathika Mam (DM Research): none of the comments are properly rectified. The institutional clearance certificate number for this study is IHEC/SDC/ORTHO/21/050.

RESULTS

Survey based on knowledge, attitude, and practice regarding the use of composites for orthodontic procedures in which 20% of the population were 1st year, 20% of the population were 2nd year, 20% of the population were 3rd year, 20% of the population were 4th year, and 20% of the population were 5th year. Eighty-two percent of the respondents knew the fact that dental composite resins are dental cements made of synthetic resins wherein 16% of the respondents felt dental

composite resins are acidic substances used to denature the tooth's natural enamel surface for adhesive application and 2% of the respondents felt that dental composite resins are made of porcelain and are both durable and esthetically attractive.

Fifty-eight percent of the respondents felt that teeth whitening is the use of composites and not orthodontics procedures [Figure 1]. Thirty-two percent of them knew the usage of orthodontic adhesive for bonding brackets onto the teeth and 2% of the participants did believe that these resins are used for the purpose of bonding a lingual bonded retainer to retain the teeth in place. Eighty-eight percent of the participants were aware of the effect of photoactivation time on the curing, whereas 12% were not. Eighty-six percent of the participants responded that under polymerization may directly be linked to the early bracket debonding. Based on the flowability of the material, 72% of the dentists preferred the high fluidity of flowable composites compared to the conventional composites for the purpose of orthodontic bonding, whereas 28% preferred [Figure 2]. Eighty percent of the participants responded that the bond strength can withhold masticatory forces and archwires tension, whereas 20% responded that the bond strength was not affected by the abovesaid factors [Figure 3].

When the participants were asked whether flowable composites and orthodontic composites have the same shear bond strength and adhesive remnant index, 84% said yes and 16% said no [Figure 4]. When the participants were asked if they were aware of the use of composites for orthodontic purposes, 86% said yes and 14% [Figure 5] said no. When the participants were asked if they know that

Table 1: The responses of the participants in a detailed manner with respective P

Questions	1 st Yr BDS students	2 nd Yr BDS students	3 rd Yr BDS students	4 th Yr BDS students	Interns	Total	Pearson correlation test
Treatment (%)							
Braces	8.00	11.30	13.30	14.00	19.30	66.00	0.000
Retainers	4.00	0.00	0.00	1.30	0.00	5.30	
Teeth whitening	8.00	8.70	6.70	4.70	0.70	28.70	
Type (%)							
Conventional composites	6.00	6.00	2.70	2.00	1.30	18.00	0.037
High fluidity of flowable composites	14.00	14.00	17.30	18.00	18.70	82.00	
Bond strength (%)							
No	5.30	4.00	2.00	0.70	0.70	12.70	0.02
Yes	14.70	16.00	18.00	19.30	19.30	87.30	
Flowable (%)							
No	5.30	4.00	2.00	0.70	0.70	12.70	0.02
Yes	14.70	16.00	18.00	19.30	19.30	87.30	
Yes	16.00	11.30	18.70	17.30	14.00	77.30	
Awareness (%)							
No	4.00	1.30	0.70	0.00	0.00	6.00	0.005
Yes	16.00	18.70	19.30	20.00	20.00	94.00	

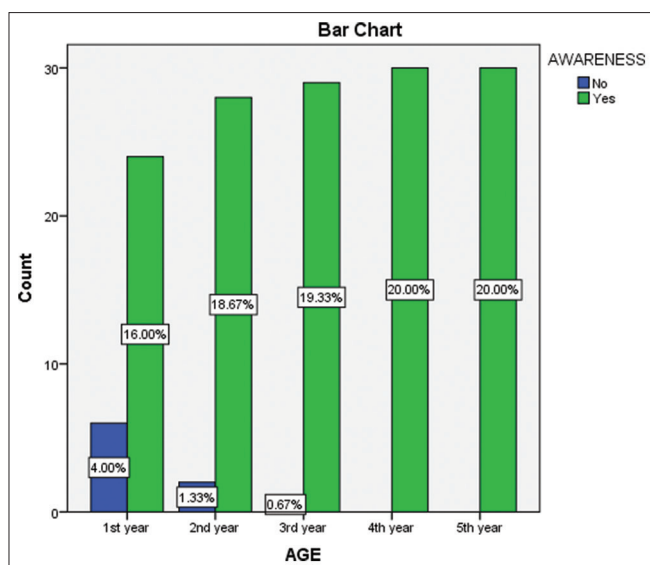


Figure 5: Represents the association between years of study and number of responses. X-axis represents the year of the study participant and Y-axis represents the frequency of responses in relation to awareness regarding the use of composites for orthodontic purposes. Blue denotes no awareness among dental students and green denotes awareness among dental students. The standard deviation of this graph is 1.54. The Pearson correlation test shows $P = 0.005$, ($P < 0.05$, statistically significant)

flowable composites had been applied for bracket bonding by multiple clinicians, 84% said yes and 16% said no. When the participants were asked whether normal composites can completely replace orthodontic composites, 90% said yes and 10% said no [Table 1]. It is evident that the knowledge, attitude, and practice regarding the use of composite for orthodontic procedures among dental students are partially good but still for some awareness lectures and camps may be helpful.

DISCUSSION

A majority of the population were educated on the use of the composite for orthodontic purposes. Furthermore, they believe under polymerization of the composite may result in early debonding of brackets. In our study, the majority of the population have awareness about the use of composite in orthodontic treatment, whereas the study done by Demling *et al.*^[25] much of the cohorts were not educated about the use of composites in braces bonding and did not have much knowledge but in our survey, majority cohorts are educated about the use of composites in orthodontic treatment.^[25]

In our study, most of the population agrees that flowable composites and orthodontic composites have the same SBS and ARI. In a similar study done by Albertini *et al.*,^[26] most of the population agreed that flowable composites and orthodontic composites have the same properties, whereas in a study done by Madaparambil *et al.*^[27] where most of

the population disagree that conventional composites and orthodontic composites have the same ARI.

The limited sample size is one of the major limitations in the study. Further studies involving more populations can be done to prevent any bias.

CONCLUSION

Within the limitations of the study, we can conclude that dental students have good knowledge, attitude, and practice regarding the use of composites for orthodontic treatment. We can also conclude that knowledge, attitude, and practice regarding the use of composites for orthodontic treatment increase with an increase in the year of study.

Acknowledgment

We thank Saveetha Dental College for providing us with the support to conduct the study.

Financial support and sponsorship

The present study was supported by the following agencies:

- Saveetha Dental College
- Saveetha Institute of Medical and Technical Sciences
- Saveetha University
- Sai Raghavendra Enterprise, Chennai.

Conflicts of interest

There are no conflicts of interest.

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