Kap Survey Among Undergraduate Students About Bonding Procedures for Fixed Orthodontic Appliances

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ABSTRACT:

INTRODUCTION: Teeth bonding is a procedure in which a tooth-colored resin material is applied and hardened with a special light curing unit which helps to bond the material to the tooth to restore or improve a person's smile. Fixed appliances are one of the most common types of orthodontic appliances. They consist of small brackets which are attached onto the anterior surface of the teeth with a dental adhesive.

AIM: The aim of the study was to find out about the knowledge, awareness and practice among non-orthodontic residents about bonding procedures for fixed orthodontic appliances.

MATERIALS AND METHODS: The present study was a cross sectional survey conducted among 100 dental students to analyze their knowledge, awareness and practice about bonding procedures for fixed orthodontic appliances. A questionnaire of 11 questions was prepared and was circulated among the students through google docs electronic media.

RESULTS: Data was collected and statistically analyzed using SPSS software. Majority of the students (96.04%) were aware about knowledge, awareness and practice about bonding procedures for fixed orthodontic appliances. P-value = 0.002 indicating statistical significance.

CONCLUSION: The present study concludes that there was adequate knowledge, awareness and practice among undergraduate students about bonding procedures for fixed orthodontic appliances.

KEYWORDS: Orthodontic appliances, bonding procedures, self-etching.

INTRODUCTION:

The introduction of bonding to orthodontics has increased the varied treatment possibilities and simplified orthodontic mechanics. The chief advantages of bonding include improved esthetics, elimination of band placement (which requires tooth separation and is a painful procedure)(1). Improved oral hygiene through easier access to the interproximal

dental areas also helps reduce the risk of enamel decalcification(2). Today as the profession is approaching over 50 years of successful, reliable orthodontic bonding, a recent survey indicates that the decline of banding against bonding is noteworthy, and maxillary first molars are routinely banded by less than a third of U.S orthodontists(3).

Materials and devices used in orthodontic bonding include brackets, adhesives and composite resins (2). Polymerisation of composite resins can be initiated chemically or by exposure to light. No-mix adhesive set with then one paste under light pressure. Moisture in sensitive primers. In an attempt to reduce the bond failure rates under moisture contamination, hydrophilic primers that can burn in wet fields bracket open trance bond MIP, 3M unitek, Monrovia, CA; assure or assure plus, reliance orthodontic products, itasca, IL) has been introduced as a potential solution.

Self-etching primers. Despite being demonstrated to provide only modest time saving (8 minutes for full mouth bonding),29 the use of self etch primers has steadily increased because of their great simplicity. Light emitting diodes – bonding of brackets and other orthodontic attachments is one of the most important stages of the whole treatment process (2,4). The simplicity of bonding can be misleading. The technique undoubtedly can be misused, not only by inexperienced clinicians but also by more experienced orthodontists who do not perform procedures with care. Success in bonding requires an understanding of and other ends to the accepted principles of orthodontic and preventive dentistry, which are cleaning the adhesive surfaces, providing good vetting, providing intimate adoption, and making use of maximum bone strength and adequate curing polymerisation.

Several indirect bonding techniques have proved reliable in clinical practice. The techniques differ in the way the brackets are attached temporarily to the model, the type of transfer tray used (5). Re-bonding is when bonded brackets become loose during treatment, consuming significant chair time or poor publicity for the office and are a nuisance to the orthodontist. The loose metal bracket removed from the arched wire should first be inspected for any possible defamation of the slot that may have occurred during break. A bracket that seems to be deformed should be replaced with a new one. Any adhesive remaining on the tooth surface is removed with the tungsten carbide bar. The adhesive remaining on the loose bracket is best treated by sand blasting 147 until all visible bonding material is removed from the base. The truth is then etched with phosphoric acid gel for 15 seconds (6). On inspection, the enamel surface may not be uniformly frosty because some areas may still retain resin. The phosphoric acid will re-etch any exposed enamel and remove the pellicle on any exposed lesson. After priming the bracket is rebonded(6,7)

Bonding is part of the orthodontic process that helps in placing braces on the teeth (8). Bonding starts off by cleaning the teeth properly using a non-flavored paste, later a cheek retractor is placed in the mouth to provide a full view of the teeth and to keep the teeth dry(9). The main goal of bracket bonding to any surface is that the attachment should be strong enough to withstand the forces of orthodontic treatment and mastication without any dislodgement by ensuring safety to the

patient by avoiding any damage to the surface during debonding following the end of the treatment(2).

Fixed orthodontic device which is fabricated specifically for treatment of a dental condition (10). There are many types of orthodontic appliances which are used on a daily basis (2).The types of fixed orthodontic appliances which are used are braces, fixed space maintainers, special fixed appliances and many more(11). Fixed Appliances are devices that are attached to the teeth and cannot be removed by the patient and are capable of causing tooth movement(1).

Our team has extensive knowledge and research experience that has translated into high quality publications(13-25). This vast research experience has inspired us to perform a study to assess the knowledge, attitude and practice about bonding procedures for fixed orthodontic appliances among non orthodontic residents.

MATERIALS AND METHODS:

A cross sectional survey was conducted among undergraduate students of various institutions in the form of a questionnaire that was circulated online. The students were of the age group 18 to 25 years. The study protocol was approved by the institutional review board and the questionnaire was validated. The sample size of this study was 100. The questionnaire consisted of 11 questions that mainly focused on knowledge, awareness and practise about bonding procedure for fixed orthodontic appliances among non orthodontic residents.

The questionnaire was distributed among the students through an online platform called google forms. The data was collected and tabulated in google sheets which was later copied to SPSS software. The output was derived and was represented in the form of pie charts and bar graphs. The Pearson Chi Square test was also done in association with the year of study. The confidence interval was found to be 95% and statistical significance of $p<0.05$. The independent variable of the study was the year of study. The results were then represented in the form of pie charts and bar charts.

RESULTS AND DISCUSSION:

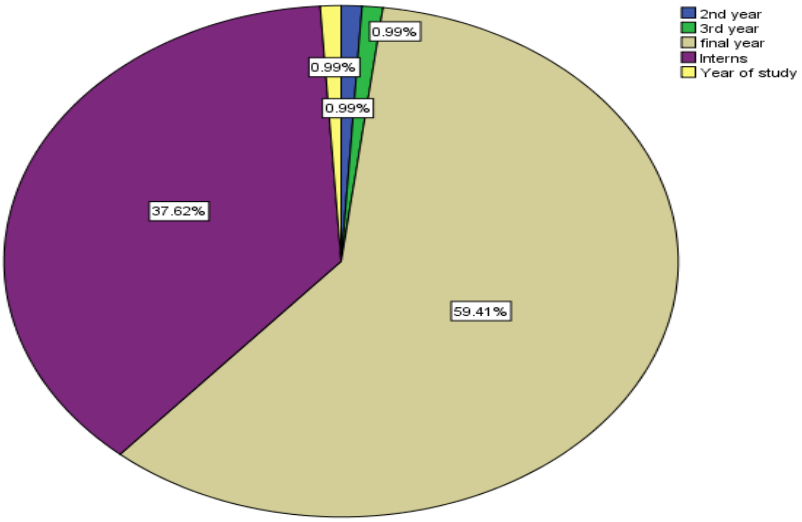

Figure 1: Pie chart represents the frequency distribution of the year of study of undergraduate students where 59.41% were final years, 37.62% were interns, 0.99% were second years and 0.99% were third years.

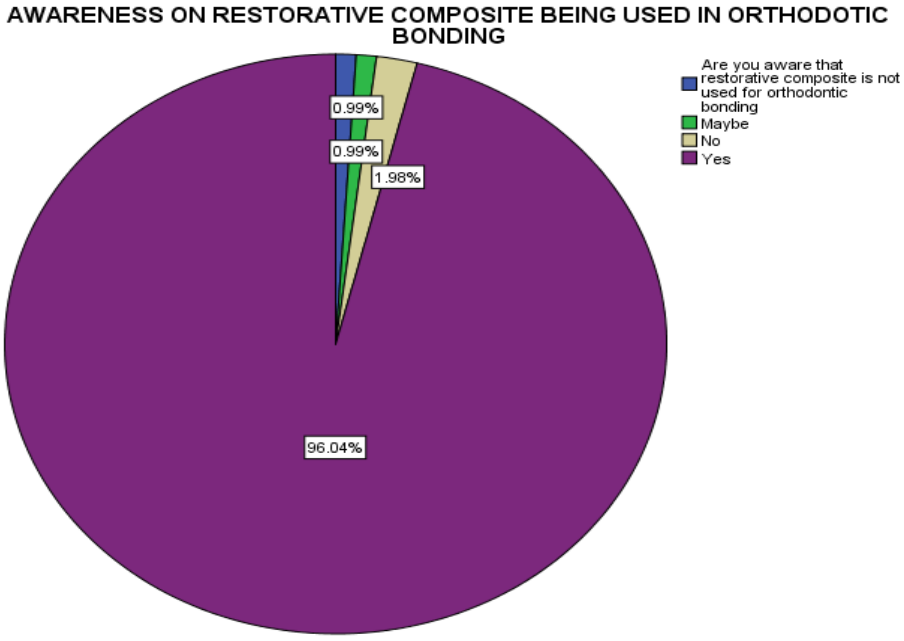

Figure 2: Pie chart representing the frequency distribution of awareness on restorative composite being used in orthodontic bonding where 96.04% were aware and 1.98% were not aware and 0.99% were not sure.

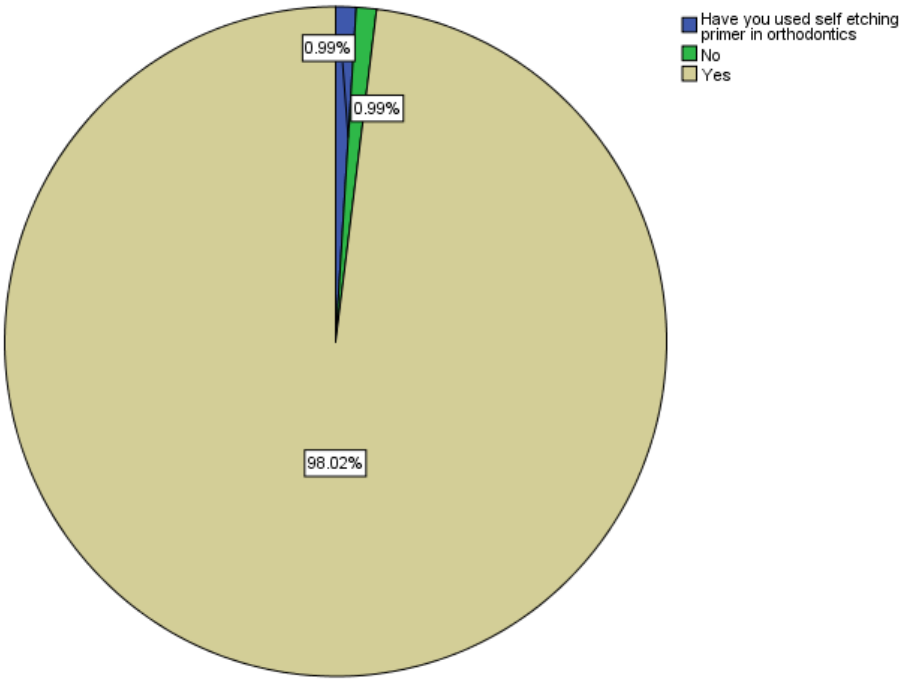

Figure 3: Pie chart representing the frequency distribution of awareness on self etching primers used in orthodontics. 98.02% were aware, 0.99% were not aware.

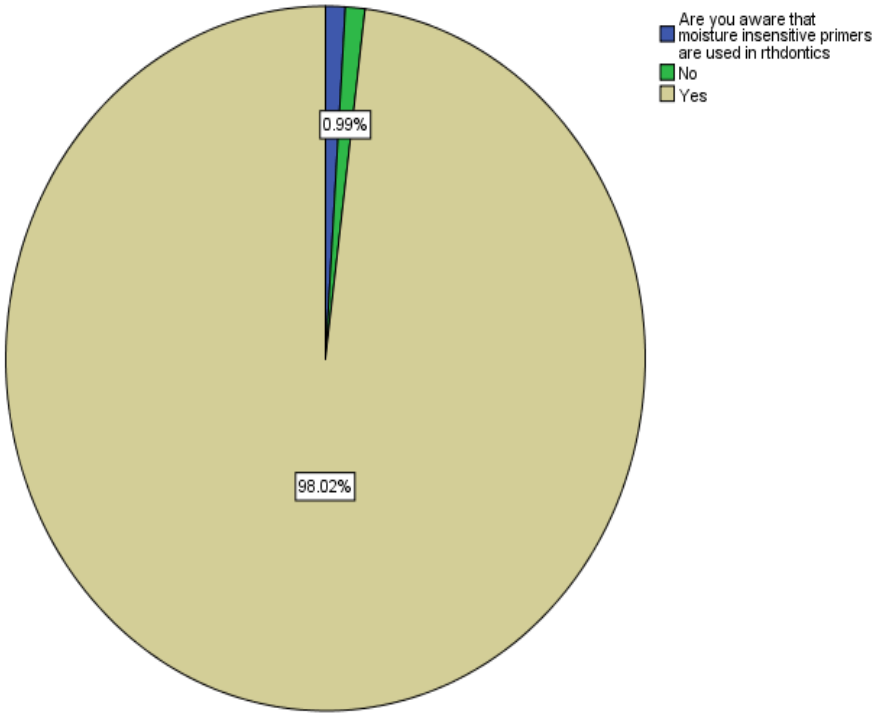

Figure 4: Pie chart representing the frequency distribution of the awareness on moisture insensitive primers used in orthodontics. 98.02% were aware, 0.99% were not aware.

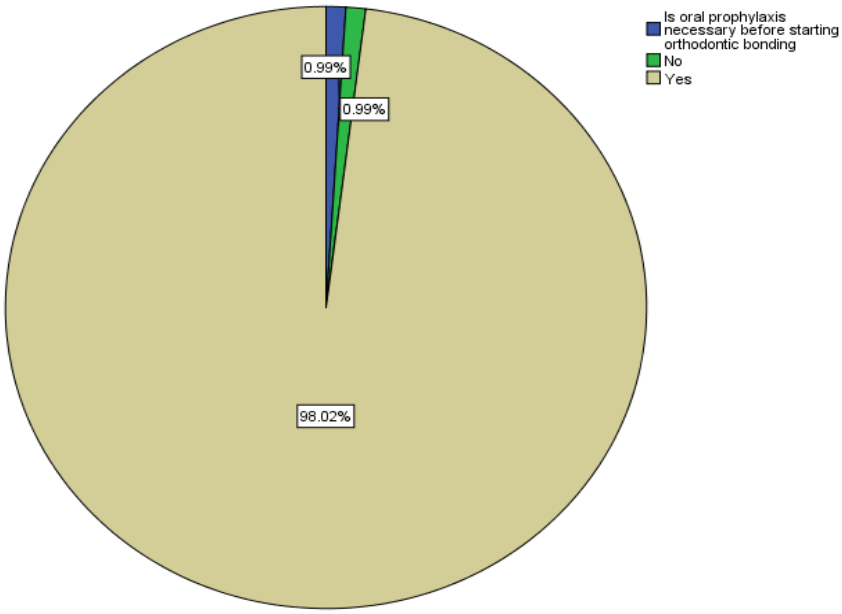

Figure 5: Pie chart representing the frequency distribution of the necessity of oral prophylaxis before starting orthodontic bonding. 98.02% of the students answered that it was necessary to do oral prophylaxis before starting orthodontic bonding. 0.99% of the students answered that it was not necessary to do oral prophylaxis before starting orthodontic bonding.

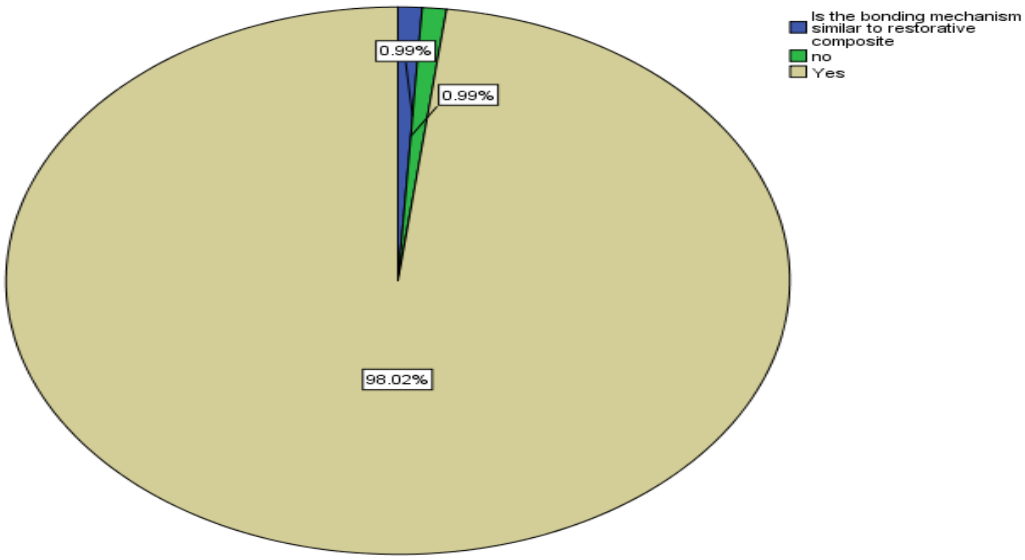

Figure 6: Pie chart representing the frequency distribution if the bonding mechanism is similar to restoration of composite. 98.02% of the students answered yes and 0.99% of the students answered no.

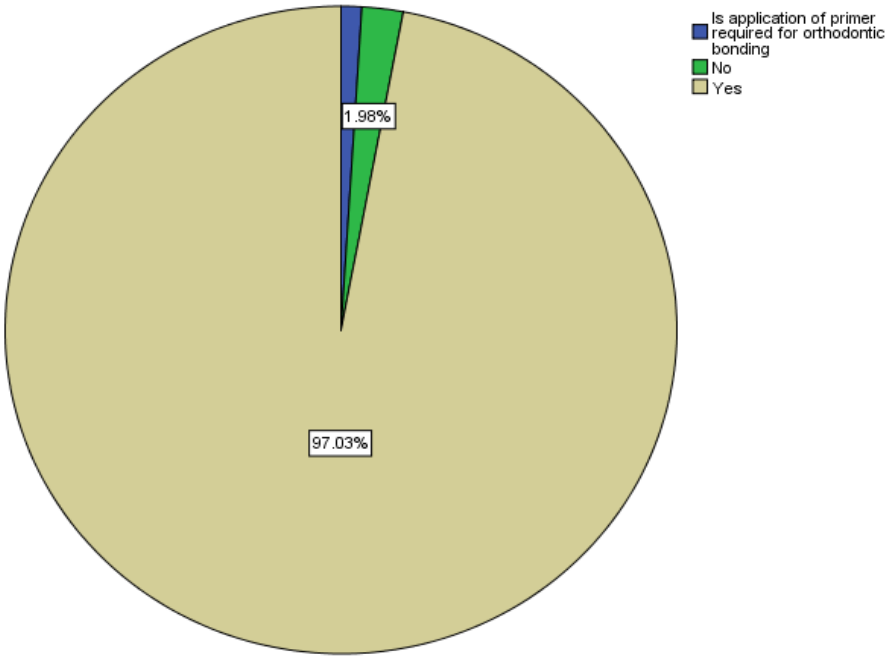

Figure 7: Pie chart representing the frequency distribution if the application of primer is required orthodontic bonding. 97.03% of the students said that it was required to apply primer required for orthodontic bonding whereas 1.98% said it was not required to apply.

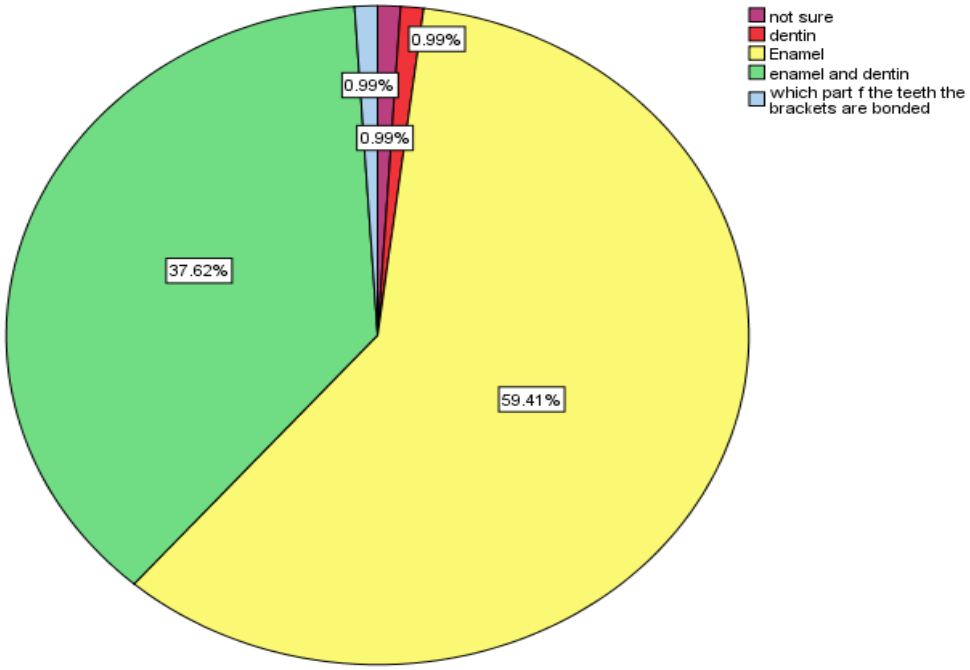

Figure 8: Pie chart representing the frequency distribution showing which part of the teeth the brackets are bonded. 59.41% of the students said enamel, 37.62% of the students said enamel and dentin, 0.99% of the students said dentin, 0.99% of the students said they were not sure.

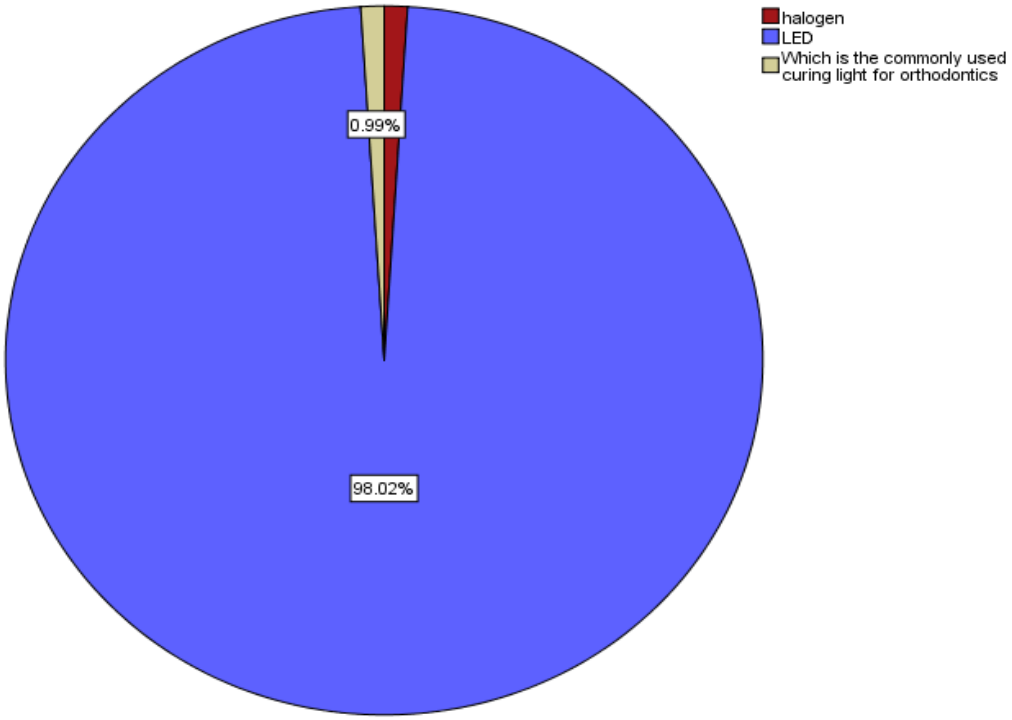

Figure 9: Pie chart representing the frequency distribution on what is the commonly used curing light for orthodontics. 98.02% of the students said LED, 0.99% of the students said halogen.

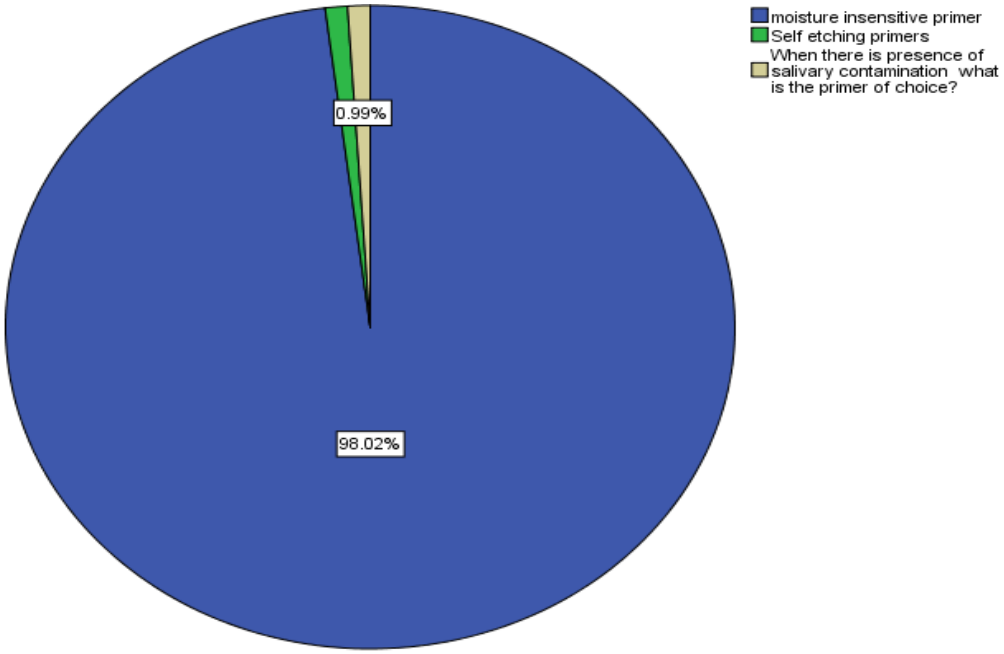

Figure 10: Pie chart representing the frequency distribution of the choice of primer when there is presence of salivary contamination. 98.02% of the students said the moisture insensitive primer, 0.99% of the students said self etching primers.

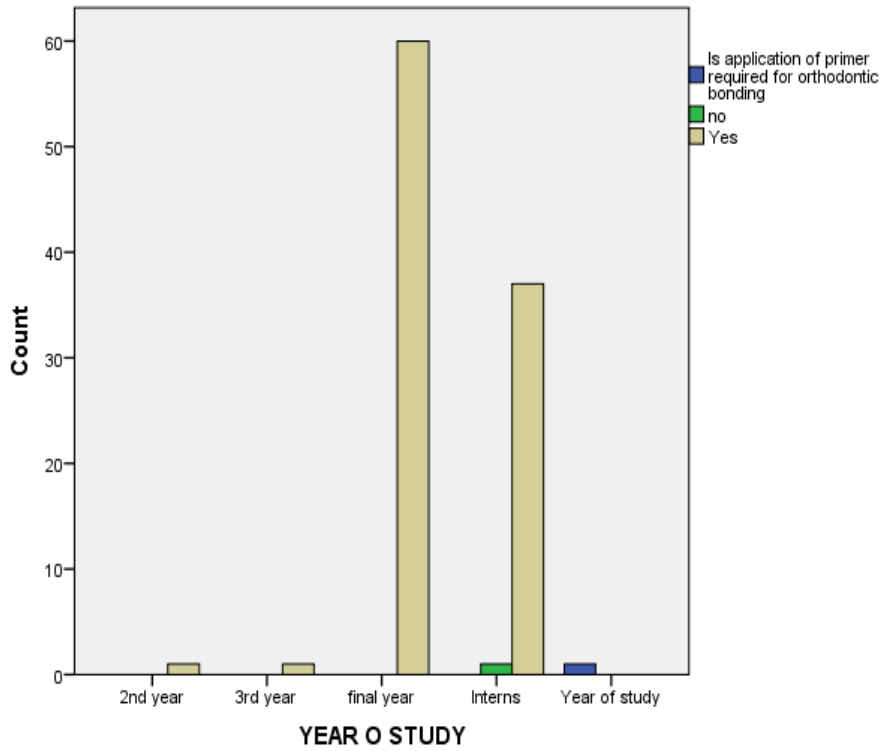

Figure 11: Bar chart depicting the association between year of study and if the application of primer required before orthodontic bonding. X axis represents year of study and Y axis represents the count. Final year students considered it was important to apply a primer for

orthodontic bonding followed by the interns, second years and third years. The p value was found to be 0.000 (p value<0.05) which was found to be statistically significant.

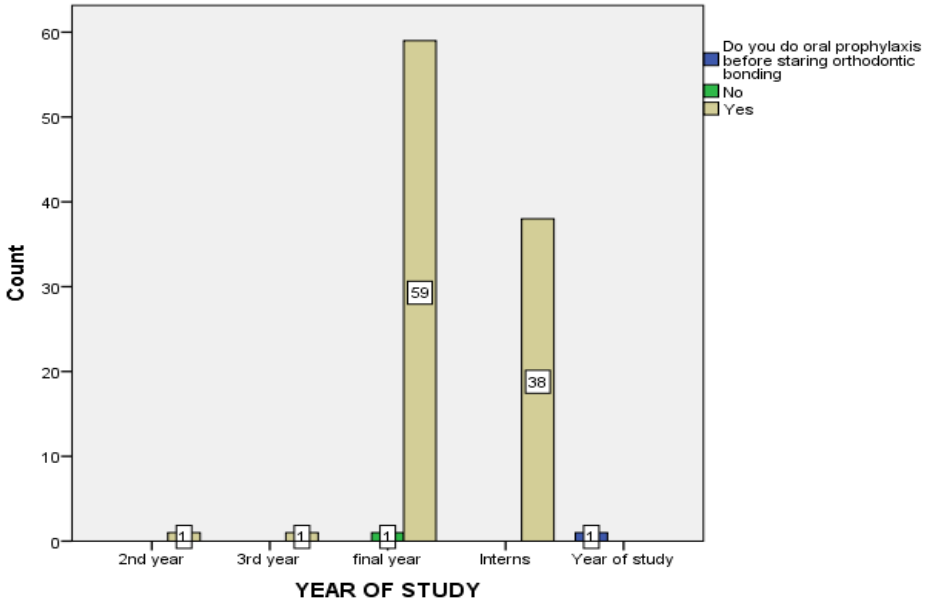

Figure 12: Bar chart depicting the association between year of study and the necessity of oral prophylaxis before starting orthodontic bonding. X axis represents the year of study and Y axis represents the count. Majority of the final year students said that oral prophylaxis was necessary before starting orthodontic bonding followed by interns, second and third year students. The p value was found to be 0.00 (p<0.05) which was found to be statistically significant.

The results were collected and the data was analysed from the study. The study was mainly done to focus on the knowledge, awareness and practice about bonding procedures for fixed orthodontic appliances. Around 59.41% of the questionnaire was answered by final year students, followed by 37.62% were interns, 0.99% were second years, 0.99% were third years. 96.04% of the students were aware about restorative composite that was being used in orthodontic bonding, 1.98% of the students had no awareness and 0.99% of the students that they may be aware of it.

Around 98.2% of the students said that they were aware that self etching primers were used in orthodontics, 0.99% said that they were not aware. 98.02% of the students were aware that moisture insensitive primers are used in orthodontics, while 0.99% of the students said they were not aware. Around 98.02% of the students felt that oral prophylaxis is necessary before starting orthodontic bonding and 0.99% of the students felt it was not necessary.

Around 98.02% of the students said that the bonding mechanism was similar to restorative composite, 0.99% of the students said that it is not similar. 59.41% of the students said that enamel is the part of the teeth where the brackets are bonded, 37.62% of the students said enamel and dentin, 0.99% students said dentin and 0.99% said not sure. Around 98.02% of the students said that LED is the commonly used curing light for orthodontics and 0.99% said halogen. Around 98.02% of the students said they would use moisture

insensitive primer in the presence of salivary contamination whereas 0.99% of the students said they would use self etching primer.

In a previous study, the age group of 14 and 17 years was found to be the least appropriate time to undergo orthodontic treatment with a fixed appliance according to psychological factors(12). A study by Kenan suggests that the PLaque index was found to be increased in a group of young dental patients who underwent orthodontic treatment and it also showed the students should have followed hygiene protocols(12). Study by spyridon`s systematic review concludes that the occlusal outcomes of fixed appliance treatment vary considerably, with no significant association between treatment outcomes and duration(12).

Limitations of the study is that the studies population includes only 100 students. It needs a large population that can be widely extended to create more knowledge, awareness and practice on fixed orthodontic appliances among non-orthodontic residents. So when the study is widespread more results on students' awareness can be analyzed.

CONCLUSION:

The present study concludes that there was adequate knowledge, awareness and practice among undergraduate students about bonding procedures for fixed orthodontic appliances. This could be attributed to the dynamic curriculum and the CDE programmes. Fixed appliances are probably the most common type of orthodontic appliances in use in recent time.Such Orthodontic treatment helps to ensure proper function of teeth and create healthy smiles. Teeth that are misaligned are harder to clean and can cause abnormal wearing of tooth enamel which can lead to extensive and expensive dental procedures.

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