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## **Knowledge, practice and attitude on management of diastema among dental students**

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**Abstract**--Introduction: Diastema is a term used in dentistry which refers to a gap between the teeth. This condition is both common in children as well as in adults. These gaps can be an aesthetic issue for individuals when they are highly noticeable. The causes for diastema can be several reasons like size of teeth, size of jaw bone etc. Treatment of diastema varies from individual to individual based on the cause of the condition. Aim: The aim of the study is to determine the knowledge, attitude and practice about management of diastema among the dental students. Materials and methods: Self-administered questionnaire was prepared based on diastema and distributed among dental students through an online survey link. The sample size was about 113 undergraduate dental students. The data was statistically analysed with the SPSS software. Results and Discussion: In the study, 94.7% of the population were aware about the term diastema and 5.3% of the population were not aware about the term diastema. 13.3% % of the participants responded that transient malocclusion is the cause for diastema, 14.2% responded midline pathology, 7% responded proclination and 65.5% responded as all of the above.

Conclusion: The present study concludes that the knowledge, attitude and practice about management of diastema among the dental students was satisfactory yet more education regarding the recent advances is necessary.

**Keywords**---Knowledge, practice, diastema, dental students, Innovative technique.

## Introduction

Diastema is a term used in dentistry which refers to a gap between the teeth. This condition is both common in children as well as in adults. These gaps can be an aesthetic issue for individuals when they are highly noticeable. The causes for diastema can be several reasons like size of teeth, size of jaw bone etc. Certain oral habits also influence diastema. It is also known that diastema can develop from periodontal diseases. The inflammation progression affects the gums and tissue supporting the teeth which eventually leads to loss of teeth. Treatment of diastema varies from individual to individual based on the cause of the condition. Diastema is generally aren't preventable but there are possibilities to reduce the risk of developing diastema. Prevention of habits like thumb sucking, tongue thrusting, improper swallowing and biting and poor oral hygiene can reduce the possibility of diastema. Midline diastema is the most common type occurring both in adults and children (1). Sometimes there can be iatrogenic causes for the condition. Fixed appliances play a major role in the rapid correction of diastema by incorporating elastics and springs (2). Retention of midline diastema is often difficult as there is a feasibility of formation of gaps again (3). The midline diastema is often influenced by genetic and environmental factors mainly in primary and mixed dentition period (4) (5). Hereditary relations and patterns also have their own correlation with midline diastema (6).

Innovative treatment for diastema has been developed in order to restore the aesthetics which are from procedures like composite build up, frenectomy etc. (7). This condition requires immediate treatment after observation as they can be treated and restored easily at the earliest (8). In previous studies it was mentioned that diastema closure in anterior teeth using recontour of gingiva and composite restoration was successful (9). There are many advances in treatment for diastema which enable much easier restoration (4).

Our team has extensive knowledge and research experience that has translate into high quality publications (10–19),(20–23),(24–28),(29). The aim of this study is to determine the knowledge, attitude and practice about management of diastema among the dental students.

## Materials and Methods

This was a survey conducted among dental students. Self administered questionnaire was taken based on management of diastema. The questionnaire (close ended questions) was circulated through an online survey link. The questionnaire included demographic data also. SPSS software was used to obtain

statistical results. Pearson chi square test was done to find the correlation between year of study and knowledge about diastema. The method of representation of results was presented by pie charts and bar diagrams.

## Results

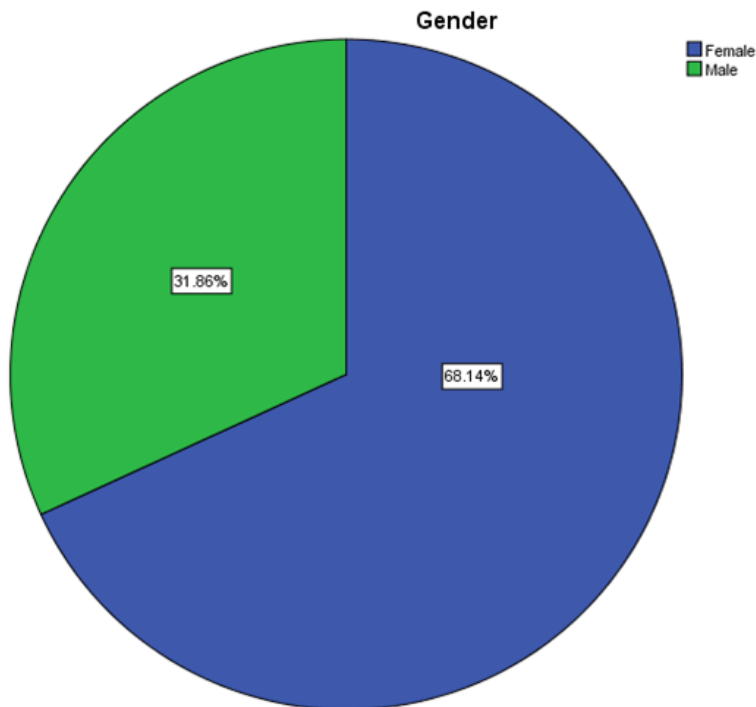


Figure 1: Pie chart showing the responses for gender of participants where blue denotes female and green denotes male. 68.14% of the participants were female and 31.9% were male.

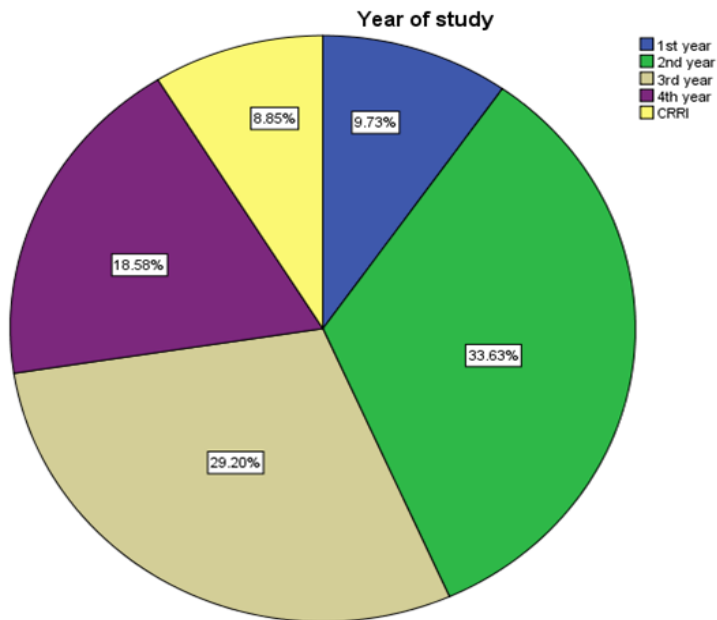


Figure 2: Pie chart showing the responses for the year of study of participants where blue denotes female and green denotes male. 33.63% of the participants were from second year, 29.20% were from third year, 18.58% were from fourth year, 9.73% from first year and 8.85% were interns.

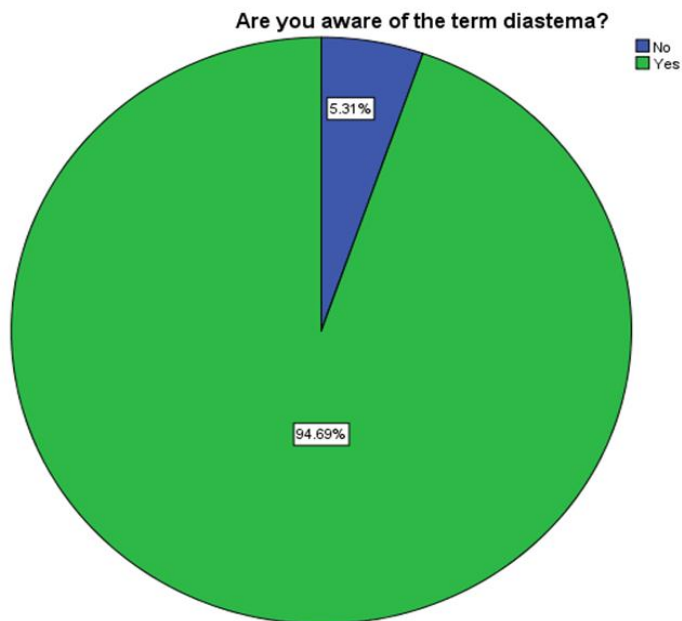


Figure 3: Pie chart showing the responses for the awareness about diastema where blue denotes no and green denotes yes. 94.69% of the participants were aware about the term diastema.

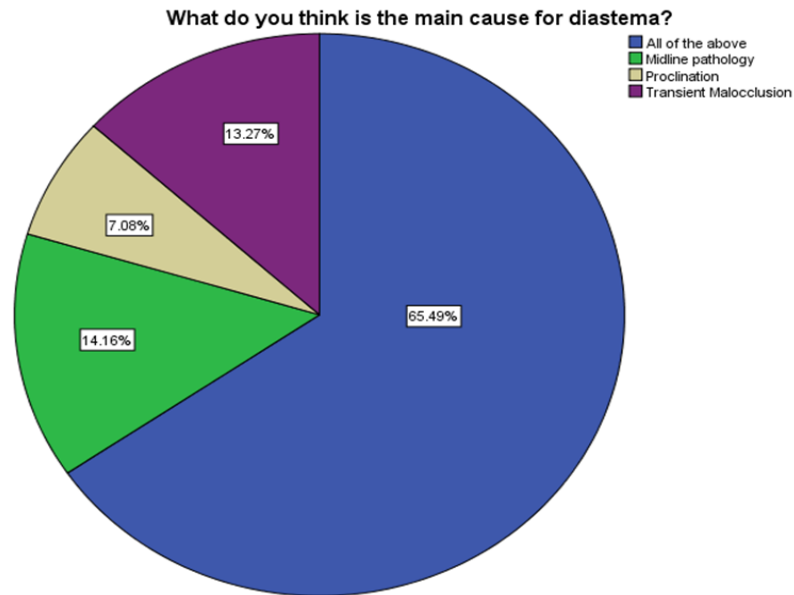


Figure-4: Pie chart showing the responses for the main cause for diastema where blue denotes all of the above, green denotes midline pathology, beige denotes proclination and purple denotes transient malocclusion. 65.49% of the participants responded to all of the above.

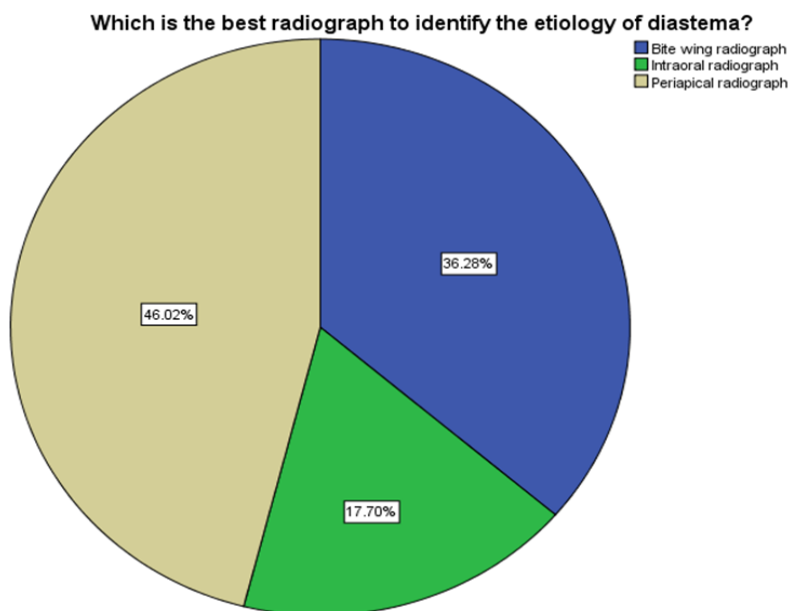


Figure-5: Pie chart showing the responses for the best radiograph to identify the etiology of diastema where blue denotes bitewing radiograph, green denotes

intraoral radiograph and beige denotes periapical radiograph. 46.02% of the participants responded periapical radiograph.

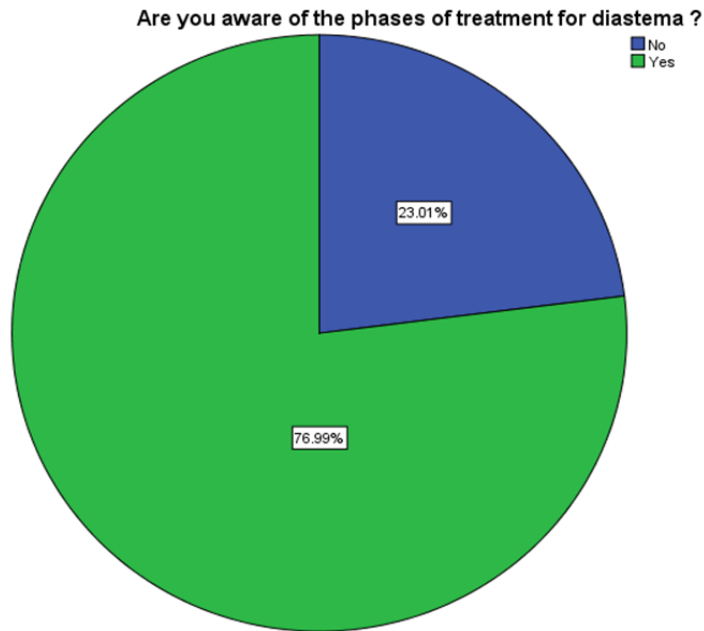


Figure 6: Pie chart showing the responses for the awareness about phases of treatment for diastema where blue denotes no and green denotes yes. 76.99% of the participants were aware about the phases of treatment for diastema.

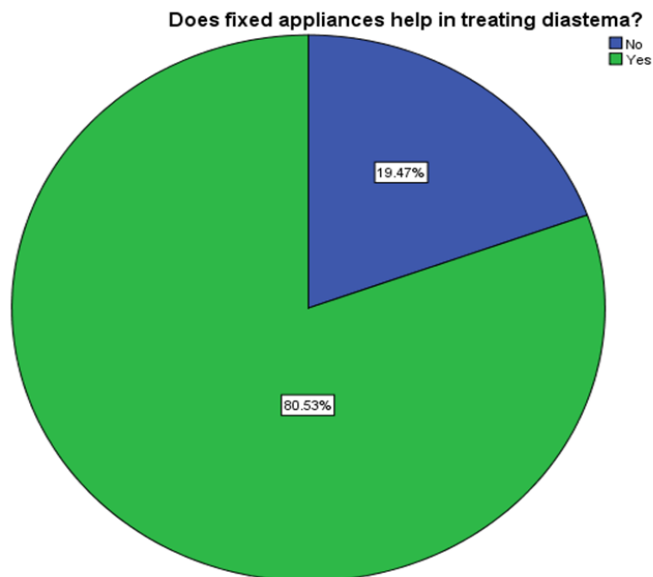


Figure-7: Pie chart showing the responses for the use of fixed appliances in treatment for diastema where blue denotes no and green denotes yes. 80.53% of the participants responded that fixed appliances help in treatment for diastema.

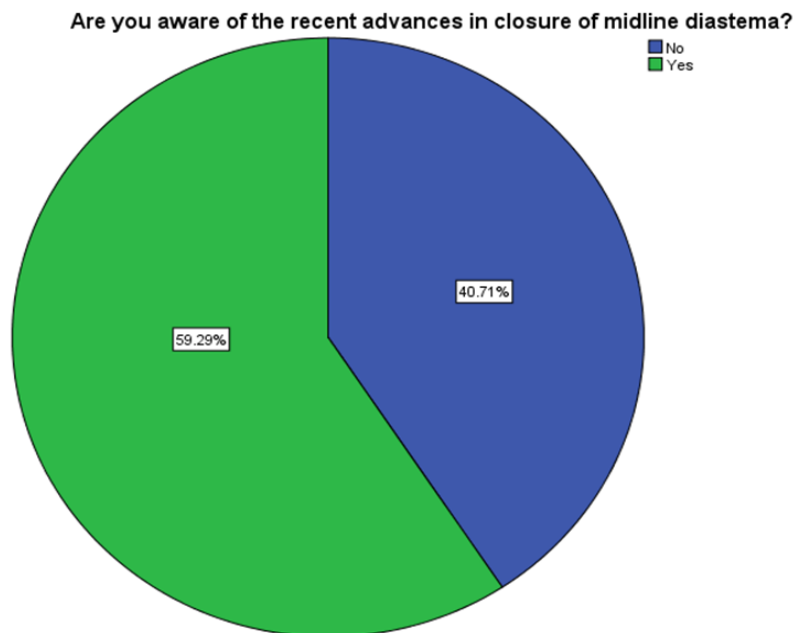


Figure 8: Pie chart showing the responses for the awareness about recent advances in treatment of diastema where blue denotes no and green denotes yes. 59.29% of the participants were aware about the recent advances in treatment for diastema.

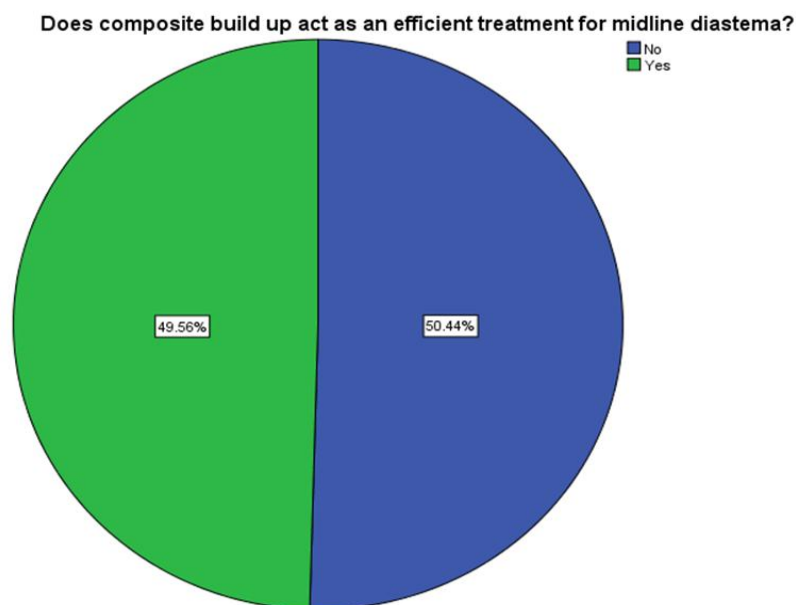


Figure-9: Pie chart showing the responses for the awareness about composite buildup where blue denotes no and green denotes yes. 50.44% of the participants

responded that composite build up acts as efficient treatment for midline diastema.

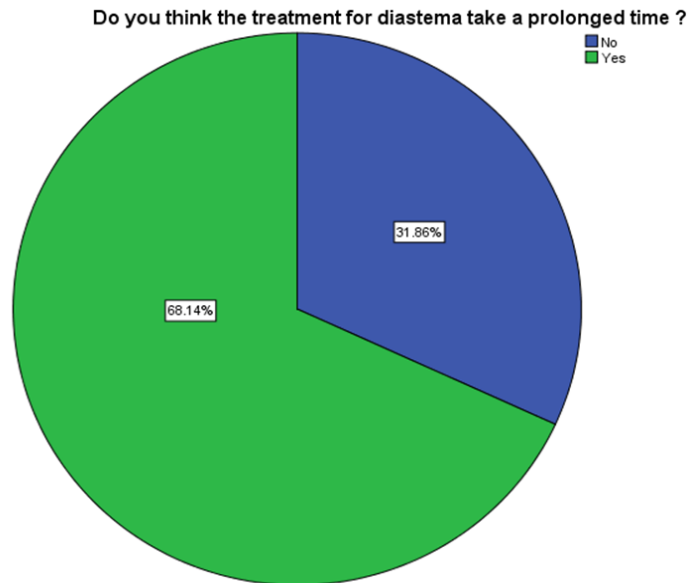


Figure 10: Pie chart showing the responses for the awareness about time taken for treatment of diastema where blue denotes no and green denotes yes. 68.14% of the participants responded that treatment for diastema takes a prolonged time.

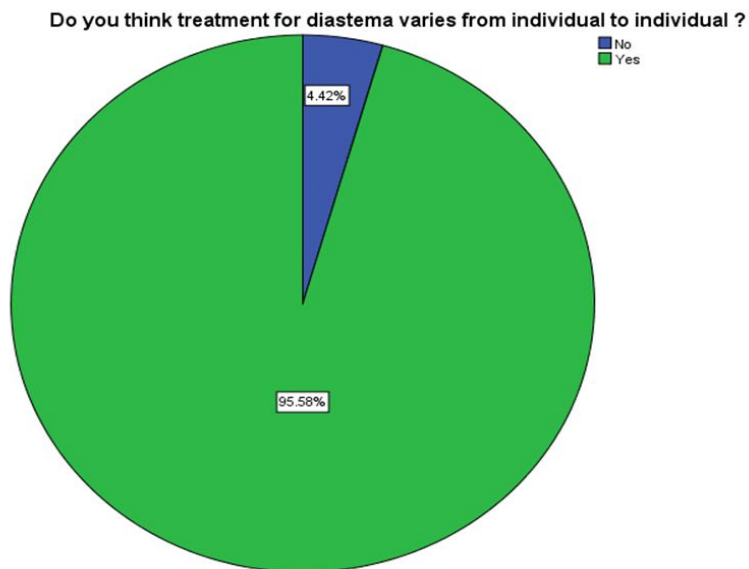


Figure 11: Pie chart showing the responses for the variation in treatment for diastema where blue denotes no and green denotes yes. 95.58% of the participants responded that treatment for diastema varies from individual to individual.



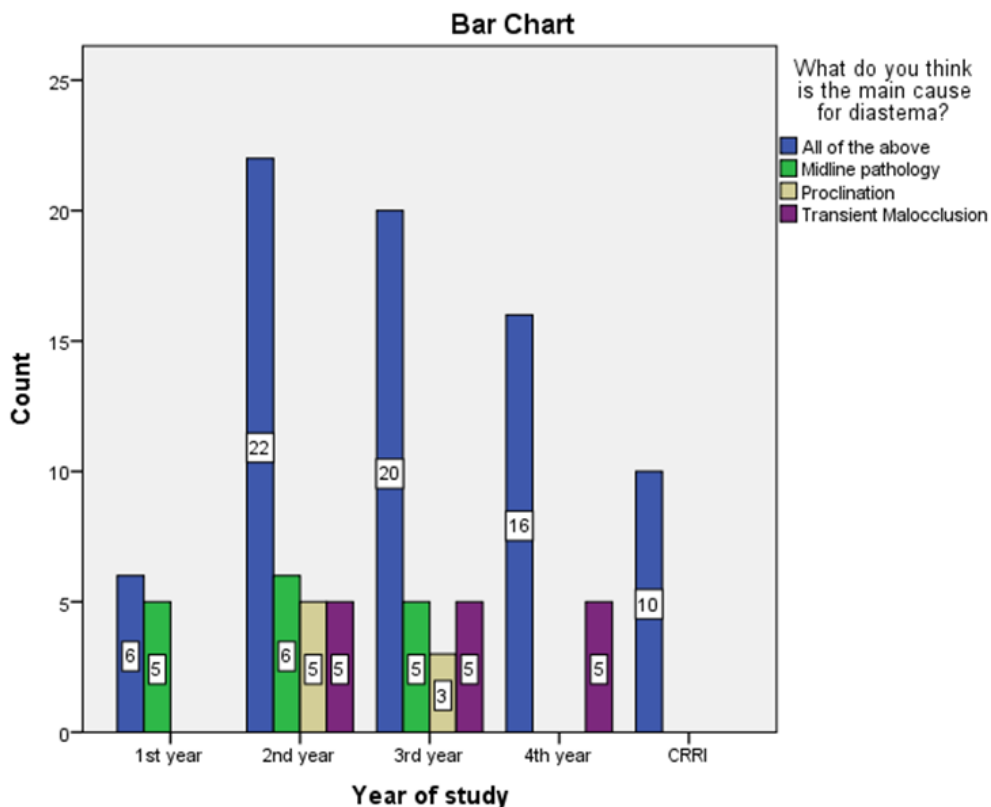


Figure-12: Bar graph depicting the association between year of study and knowledge about the main cause of diastema. X-axis represents the year of study and Y-axis represents the number of participants. The colour blue denotes all of the above, green denotes midline pathology, beige denotes proclination and purple denotes transient malocclusion. (Pearson Chi square value-24.711, P-value-0.016[<0.05]-statistically significant). Out of 113 participants, 6 participants from the first year, 22 participants from second year, 20 participants from third year, 16 participants from fourth year and 10 participants from interns responded to all of the above.

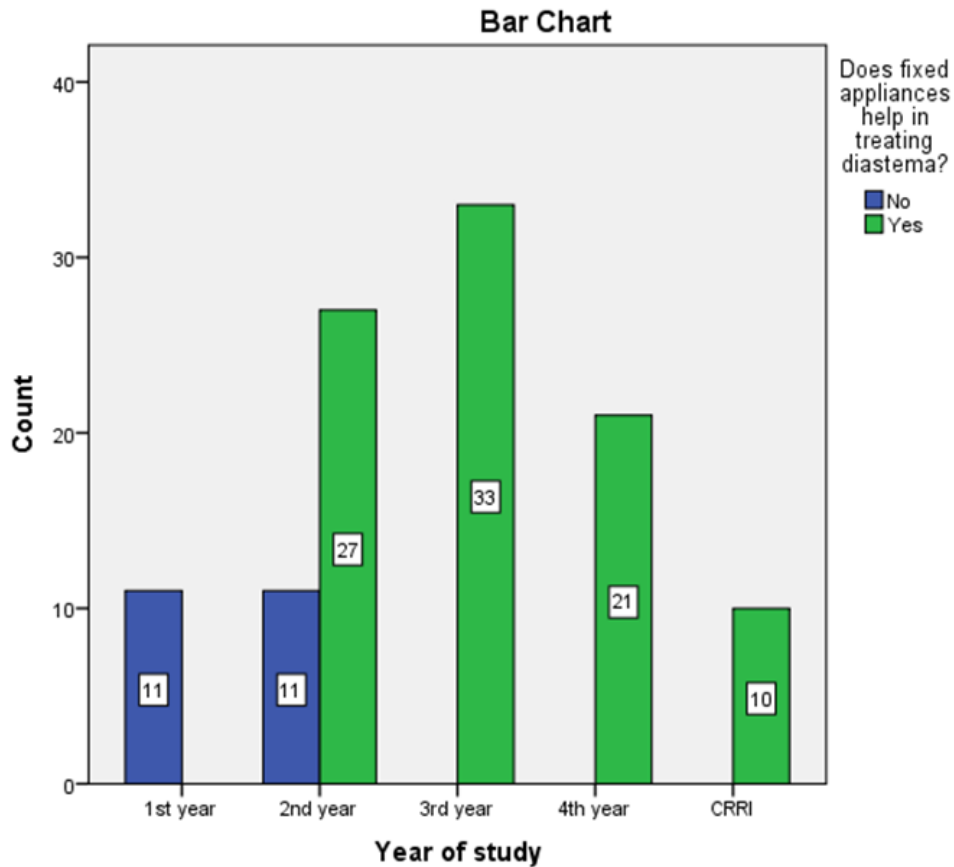


Figure-13: Bar graph depicting the association between year of study and knowledge about the use of fixed appliances in treatment for diastema. X-axis represents the year of study and Y-axis represents the number of participants. The colour blue denotes no and green denotes yes. (Pearson Chi square value-63.150, P-value-0.00[<0.05]-statistically significant). Out of 113 participants, 27 participants from second year, 33 participants from third year, 21 participants from fourth year and 10 participants from interns responded that fixed appliances help in treatment for diastema.

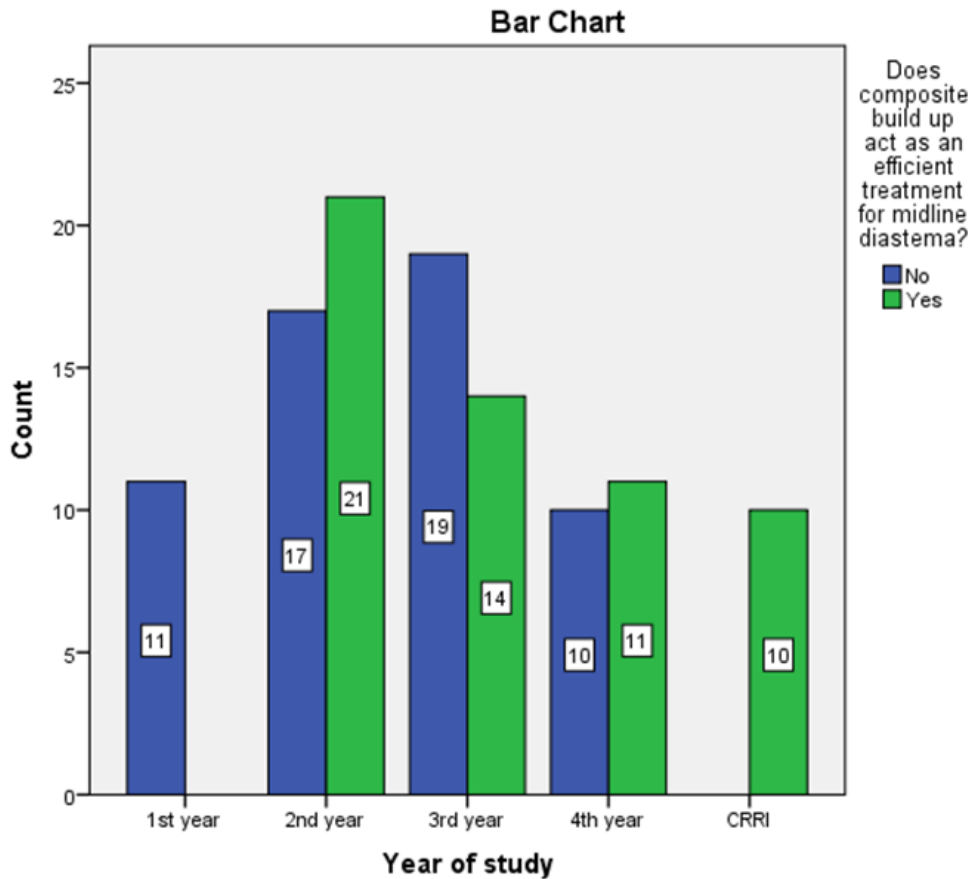


Figure-14: Bar graph depicting the association between year of study and knowledge about the use of composite in treatment for diastema. X-axis represents the year of study and Y-axis represents the number of participants. The colour blue denotes no and green denotes yes. (Pearson Chi square value-22.219, P-value-0.00[<0.05]-statistically significant). Out of 113 participants, 21 participants from second year, 14 participants from third year, 11 participants from fourth year and 10 participants from interns responded that composite build up acts as an efficient treatment for midline diastema.

68.14% of the participants were female and 31.9% were male (Figure-1). 33.63% of the participants were from second year, 29.20% were from third year, 18.58% were from fourth year, 9.73% from first year and 8.85% were interns (Figure-2). 94.69% of the participants were aware about the term diastema (Figure-3). 65.49% of the participants responded to all of the above (Figure-4). 46.02% of the participants responded periapical radiograph (Figure-5). 76.99% of the participants were aware about the phases of treatment for diastema (Figure-6). 80.53% of the participants responded that fixed appliances help in treatment for diastema (Figure-7). 59.29% of the participants were aware about the recent advances in treatment for diastema (Figure-8). 50.44% of the participants

responded that composite build up acts as efficient treatment for midline diastema (Figure-9). 68.14% of the participants responded that treatment for diastema takes a prolonged time (Figure-10). 95.58% of the participants responded that treatment for diastema varies from individual to individual (Figure-11).

## **Discussion**

In the present study, 68.14% of the participants were female and 31.86% of the participants were male (Figure-1). 33.63% of the participants were from second year, 29.20% were from third year, 18.58% were from fourth year, 9.73% from first year and 8.85% were interns (Figure-2).

In the study by Patricia et al., due to increase in demand for facial aesthetics, awareness about various dental trauma conditions is found to be prevalent among patients (30). In the study, 94.69% of the population were aware about the term diastema and 5.31% of the population were not aware about the term diastema (Figure-3). 13.27% of the participants responded that transient malocclusion is the cause for diastema, 14.16% responded to midline pathology, 7.08% responded to proclination and 65.49% responded as all of the above (Figure-4). In the present study, 46.02% of the population answered that periapical radiograph is the best radiograph to identify the etiology of diastema, 36.28% answered as bitewing radiograph and 17.70% answered as intraoral radiograph (Figure-5).

76.99% of the population were aware and the remaining 23.01% of the population were not aware about the phases of treatment of diastema (Figure-6). 80.53% responded that fixed appliances help in treating diastema and the remaining 19.47% responded that fixed appliances do not help in treating diastema (Figure-7). In the study by Wesley et al., the clinical report explained the use of computer-aided design and computer-aided manufacturing (CAD-CAM) composite resin in closure of a maxillary midline diastema (31). In this study, 59.29% were aware about the recent advances in closure of midline diastema and 40.71% were not aware (Figure-8). In the study by William et al., the use of a new silicone index helped in diastema closure which improves gingival tissue health (32). In the study by Edina et al., the application of direct restorations provided an excellent treatment option for closure of diastemas (33).

50.44% of the participants responded that composite build up acts as an efficient treatment and 49.56% of the participants responded that they are not efficient in treatment (Figure-9).

In association with the time of treatment of diastema, 68.14% of the participants answered that the treatment will take a long time and 31.86% of the participants answered that the treatment will not take a prolonged time (Figure-10). 95.58% of the participants responded that treatment for diastema varies from individual to individual and the remaining 4.42% responded that it does not vary (Figure-11). In the study by Ana et al., the case report showed minimally invasive diastema treatment due to gingival trauma where it was evident that the cause for diastema shows variations (34) .

In the association between years of study and knowledge about the main cause of diastema, out of 113 participants, the majority 22 participants from second year responded all of the above (Figure-12). In the association between years of study and knowledge about the use of fixed appliances in treatment for diastema, out of 113 participants, majority 33 participants from third year responded that fixed appliances help in treatment for diastema (Figure-13). In the association between years of study and knowledge about the use of composite in treatment for diastema, out of 113 participants, majority 21 participants from second year responded that composite build up acts as an efficient treatment for midline diastema (Figure-14). The limitations of the study is that the survey was conducted with a limited sample size. This survey can be used as a reference for future studies with a wider range of population.

### **Conclusion**

The present study concludes that the knowledge, attitude and practice about management of diastema among the dental students was satisfactory yet more education regarding the recent advances is necessary.

### **Acknowledgement**

This research was done under the supervision of the Department of Research of Saveetha Dental College and Hospitals. We sincerely show gratitude to the corresponding guides who provided insight and expertise that greatly assisted the research.

### **Conflicts of Interest**

The authors declare that there are no conflicts of interest in the present study.

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