

# AWARENESS ON FUNDAMENTALS OF FIXED PROSTHODONTICS AMONG DENTAL STUDENTS

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## ABSTRACT

The aim of this study was to create awareness on fundamentals of fixed prosthodontics among dental students. It is the specialised area of dentistry involving the replacement. Missing teeth of the cast prosthesis is permanently cemented. Complete development of dental process leads to new complete virtual environment without any physical model situation. This study was a cross-sectional survey based study conducted among the dental students on the fundamentals of fixed prosthodontics. The questionnaire was distributed through the "Google forms" website to around 100 Dental students. In the present study about 56% of the population are aware of the prosthodontics and 44% of the population is not aware of the prosthodontics. Regarding the parts of fixed partial dentures 39% of the population are aware and 61% of the population are not aware of it. This concludes that the knowledge and awareness on the fixed prosthodontics is moderate among the dental students, in which among them the second year undergraduates had a higher knowledge on the fixed prosthodontics.

**Keywords:** Awareness; Dental Students; Fundamentals; Knowledge.

## INTRODUCTION

Fixed prosthodontics or fixed prostheses is a non removable dental restoration. Unlike removable prosthesis, which can be removed and inserted by the patients. The fixed prosthodontics can only be done by the doctor. Fixed prosthodontics is the specialised area of dentistry involving the replacement. Missing teeth of the cast prosthesis is permanently cemented (Haselton, 2002). Complete development of dental process leads to new complete virtual environment without any physical model situation. (Walmsley, 2012) It has been used to restore single multiple teeth spanning areas when the tooth is lost. The suspicious strength is used in large restoration of ability to create aesthetic looking teeth (Nimmo and William Knight, 1996). The most clinical complication in fixed prosthodontics is associated with single crowns, fixed partial denture, all ceramic crowns, resin bonded prosthesis, and post and cores. The lowest incidence of clinical complication was associated with all ceramic crowns (Mansueto, 2002). The CDA rating system is used for evaluation of the clinical quality of restoration in the fixed prosthodontics (Valderhaug, 1991).

Fixed prosthodontics are used to liquid control impression making, dental concretes and cementation techniques, that spreads shading and shade choice in incredible detail. At long last, it examines the manufacture of temporary reclamations, the rebuilding of endodontically rewarded teeth and the creation of bonded bridges. All-metal reclamations are broadly utilized in dentistry and their notoriety might be credited for their numerous potential benefits over different sorts of rebuilding. Metal rebuilding efforts, normally gold composites, can be structured as full facade crowns, trims, onlays, three-quarter crowns, post crowns and scaffolds. (Nimmo and William Knight, 1996) Metal-ceramic rebuilding efforts were created as a trade off between the prevalent style of all-ceramic reclamations and the quality of all-metal rebuilding efforts. A wax design is delivered for the metal structure that will bolster the earthenware and supplant the morphology of the tooth where required. (Walmsley, 2012) High-strength fired foundations are progressively delivered utilizing CAD-CAM creation techniques. Further research is necessary to proof and confirm the three included RCTs, therefore clinical recommendation cannot be given in complete digital processing in fixed prosthodontics. Further trials should be done as well as the economic outcomes comparing digital workflames with observation period must be implemented. The aim of this study was to create awareness on fundamentals of fixed prosthodontics among dental students.

## **MATERIALS AND METHODS**

A cross sectional study was conducted from April to May 2020 through an online survey among Undergraduate dental college students of private dental institutions. A convenient sample of 100 undergraduate dental college students was done. Among the participants, 27 participants belong to first year, 39 participants belong to second year, 9 participants belong to third year, 10 participants belong to fourth year and 15 participants belong to interns. The pros of the present study is that it is a quick study and quick interpretation. The cons of the study are that severe fatigue, homogeneous population and response bias. All dental students who were willing to participate were included. All students who were not willing to participate were excluded.

Self administered questionnaires of 10 close ended questions were prepared and it was distributed among dental students through an online survey form "Google form". Demographic details were also included in the questionnaire. The data from the Google forms is analysed and then put into the excel sheet and then tabulation of the data finally the question comparison. The representation of the data is through a bar graph. Data was analysed with SPSS version (22.0). (Duraisamy *et al.*, 2019) (Ganapathy *et al.*, 2016) (Jain, Ranganathan and Ganapathy, 2017) (Ashok and Suvitha, 2016) (Ajay, Suma, S. Ali, *et al.*, 2017) Descriptive analyses as number and percent were calculated to summarise qualitative data. Chi square test was used to analyse and compare the year of study of the dental students and their knowledge and awareness of various diets for detoxification and maintenance of oral health. The independent variable of the present study is the age and gender.

## **RESULTS AND DISCUSSION**

Among 100 participants, 30.30% were males and 69.70% were females. Among the dental undergraduates college students, 27.27% of the participants belong to first year, 39.39% of the participants belong to second year, 9.09% of the participants belong to third year, 10.10% of the participants belong to fourth year and 14.15% of the participants belong to interns.

In our present study, 69.70% of the study population were aware of fixed Prosthodontics and 30.30% of the study population were not aware of the fixed Prosthodontics (figure 1). 39.39% of the study population felt that fixed partial dentures are susceptible to gingivitis and 19.19% of the study population felt that fixed partial dentures are susceptible to periapical diseases. 15.15% of the study population felt that fixed partial dentures are susceptible to pulp necrosis and 26.26% of the study population felt that fixed partial dentures are susceptible to periapical disease (figure 2). 18.18% responded retainers are parts of FPD and 12.12% answered the parts of fixed partial denture is connectors and 37.37% responded the parts of fixed partial denture is 'all', pontics, retainer and the connector (figure 3).

77.78% of the study population answered fixed partial denture replaces the missing tooth and 22.22% answered fixed partial denture does not replace the missing tooth (figure 4). 35.35% of the study population answered the artificial tooth on fixed partial denture is pontics and 40.40% answered the artificial tooth on fixed partial denture is retainer and 24.24% answered connector (figure 5). 67.68% of the study population were aware of the factors that aid success of using fixed partial denture and 32.32% of the study population were not aware of the factors which aid the success of FPD (figure 6). 12.12% answered connector unites retainer and pontics, 56.57% answered denture border unites retainer and pontics and 31.31% answered none of the above (figure 7).

The fixed partial denture is being more susceptible to, 38.2% PDL disease, 26.5% gingivitis, 20.6% pulp alive necrosis, 14.7% periapical disease. The 4th year undergraduates had responded 30.8% PDL disease susceptible to fixed partial denture. Chi square value - 18.005; p value - 0.116 (>0.05) hence not significant (figure 8). Wennstrom et al 2004 has the similar findings of 48% (Abduo, Lyons and Swain, 2010). No previous article with opposite findings. The parts of fixed partial denture are 38.2% retainer, pontics, connector and 32.4% they responded retainer, 17.6% they responded pontics, and 11.8% they responded connector. The 3rd year undergraduates responded 38.2% all parts. Chi square value - 18.047; p value - 0.114 (>0.05) hence not significant (figure 9). Steven et al, 1984 had a similar finding ('Re-Treatment of a Fractured Implant Fixed Partial Denture in the Posterior Maxilla with CAD/CAM Abutments and a New Fixed Partial Denture', no date). No previous article with the opposite finding. Fixed partial denture replaces missing tooth, 78.4% agreed and 17.6% disagreed. 3rd year undergraduate students responded 78.4% fixed partial denture replaced missing tooth. Chi square value - 2.281; p value - 0.684 (>0.05) hence not significant (figure 10) de Backer et al is, 2005 (Lang et al., 1998), which is a similar finding, no previous article with opposite findings. The artificial tooth on fixed partial dentures is called, 40.2% its pontics, 34.3% its retainers, 25.5% its connector.

The 4th year undergraduate students, 40.2% said artificial tooth on fixed partial denture is called pontics. The Pearson chi square test showed Chi square value - 10.944; p value - 0.205 (>0.05) hence not significant (figure 11). Debra et al, 2002 who had a similar findings (Friedman, 1954). No previous article with opposite finding. The amendments of the surrounding bone play a very important role in important roles in FPD, they responded 67.6% true, and 32.4% false. The 2nd year undergraduate students responded 67.6% abutments, surrounding bone play important role in FPD. The Pearson chi square test showed p value 0.736 (->0.05) which is statistically insignificant. Hania A et al, 1992 who had a similar finding (Li and Sun, 2018). No previous article with opposite finding. Appliance that unites the retainers and pontics, 42.2% they responded connector, 31.4% they responded denture base and 14.7% denture border and 11.8% they responded none. 1st year undergraduate students responded 42.2% connector unites pontics and retainer. Chi square value - 15.942; p value - 0.043 (<0.05) hence it is significant (figure 12). S. Banerjee et al, 1992 had a similar findings (9). No previous article with opposite finding. The limitations of this study includes less sample size and it can include more type populations. In the future the study can be expanded to more number of participants making them aware about the fundamentals of fixed prosthodontics.

The present research has origin from previous studies, where the investigators involved in studies which were done based on clinical reports, interventional studies (Arigaet et al., 2018)(Jyothiet al., 2017)(Ashok et al., 2014)(Ajay, Suma, S. A. Ali, et al., 2017) (Venugopalan et al., 2014), in vitro studies (Duraisamy et al., 2019) (Ganapathy et al., 2016)(Jain, Ranganathan and Ganapathy, 2017) (Ajay, Suma, S. A. Ali, et al., 2017) and systematic reviews (Arigaet et al., 2018)(Selvan and Ganapathy, 2016)(Subasree, Murthy Kumar and Dhanraj, 2016) (Vijayalakshmi and Ganapathy, 2016) (Ganapathy, Kannan and Venugopalan, 2017) (Kannan and Venugopalan, 2018)(Basha, Ganapathy and Venugopalan, 2018). The limitation of this study is less sample size. In future an extensive study with large sample size and varied population can be used to assess the knowledge and awareness on the fundamentals of fixed prosthodontics.

## CONCLUSION

In our present study the knowledge and awareness on the fixed prosthodontics is moderate among the dental students, in which among them the second year undergraduates had a higher knowledge on the fundamentals of fixed prosthodontics(70%).

### **AUTHOR CONTRIBUTIONS**

Author 1 (KirthickKumaran. A. S), carried out the study by collecting data and drafted the manuscript after performing the necessary statistical analysis. Author 2 (Dr. L. KeerthiSasanka) aided in conception of the topic, has participated in the study design, statistical analysis and has supervised in preparation of the manuscript. Author 3 (Dr. ArchanaSanthanam) has participated in the study design and has coordinated in developing the manuscript. All the authors have discussed the results among themselves and contributed to the final manuscript.

### **ACKNOWLEDGEMENT**

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### **CONFLICT OF INTEREST**

None declared

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## LEGENDS

## FIGURES

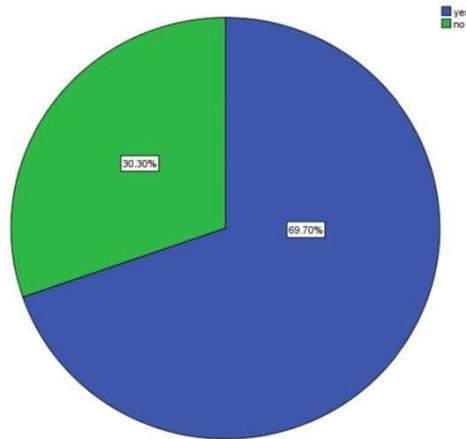


Figure1: Pie chart represents the frequency distribution of awareness on fixed prosthodontics. 69.70% of the study population were aware of fixed Prosthodontics. 30.30% of the study population were not aware of the fixed Prosthodontics.

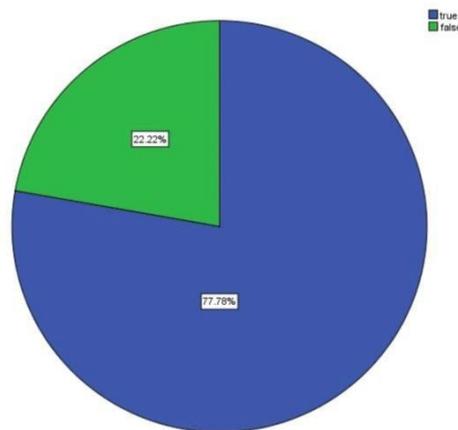


Figure2: Pie chart represents the frequency distribution of awareness on basic information regarding fixed partial denture. 77.78% of the study population answered fixed partial denture replaces the missing tooth and 22.22% answered fixed partial denture does not replace the missing tooth.

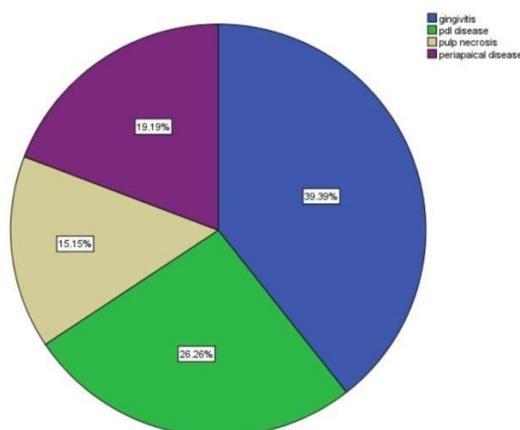


Figure 3: Pie chart represents the frequency distribution about susceptibility of fixed partial dentures. 39.39% of the study population responded that fixed partial dentures are susceptible to gingivitis. 19.19% of the study population responded that fixed partial dentures are susceptible to periapical diseases. 15.15% of the study population responded that fixed partial dentures are susceptible to pulp necrosis. 26.26% of the study population felt that fixed partial dentures are susceptible to periapical disease.

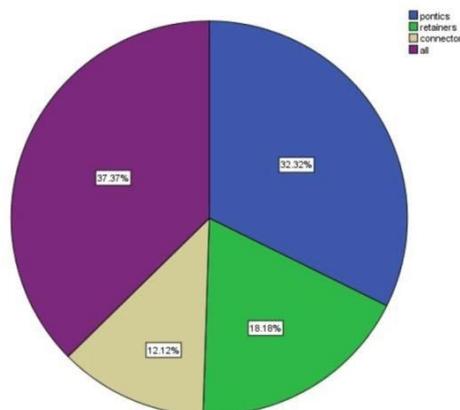


Figure 4: Pie chart represents the frequency distribution of awareness on parts of FPD. 32.32% of the study population answered the parts of fixed partial denture is pontics, 18.18% responded retainers are parts of FPD, 12.12% answered the parts of fixed partial denture is connectors and 37.37% responded the parts of fixed partial denture is 'all',pontics,retainer and the connector.

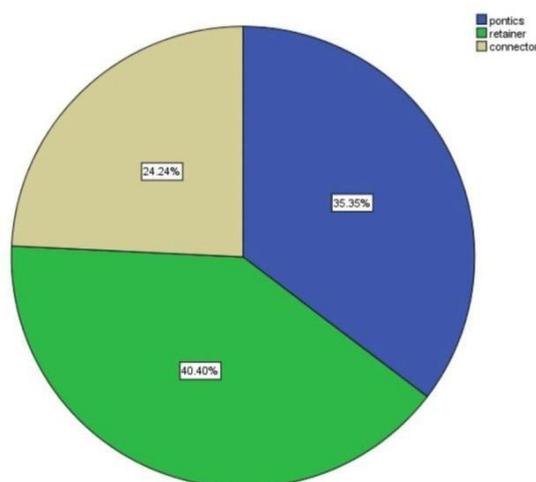


Figure 5- Pie chart represents the frequency distribution of awareness of the artificial tooth in fixed partial denture. 35.35% of the study population answered the artificial tooth on fixed partial denture is pontics, 40.40% answered the artificial tooth on fixed partial denture is retainer and 24,24% answered connector.

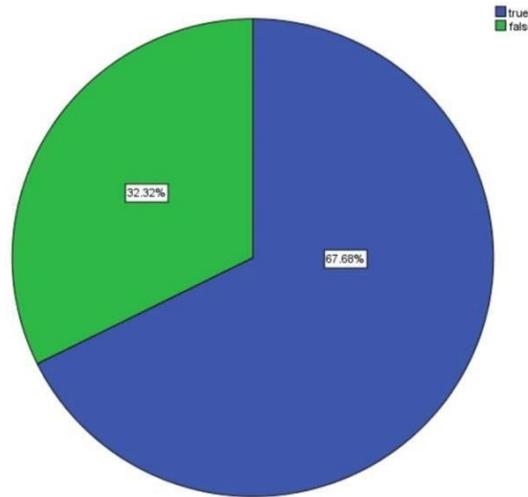


Figure 6- Pie chart represents the frequency distribution of awareness on the factors which aid the success of fixed partial denture. 67.68% of the study population were aware of the factors that aid success of using fixed partial denture and 32.32% of the study population were not aware of the factors which aid the success of FPD.

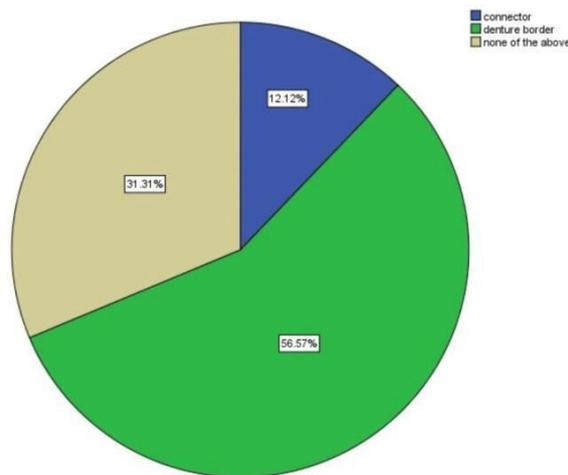


Figure 7- Pie chart represents the frequency distribution of knowledge of respondents regarding the part that connects retainers and pontics. 12.12% answered connector unites retainer and pontics, 56.57% answered denture border unites retainer and pontics and 31.31% answered none of the above.

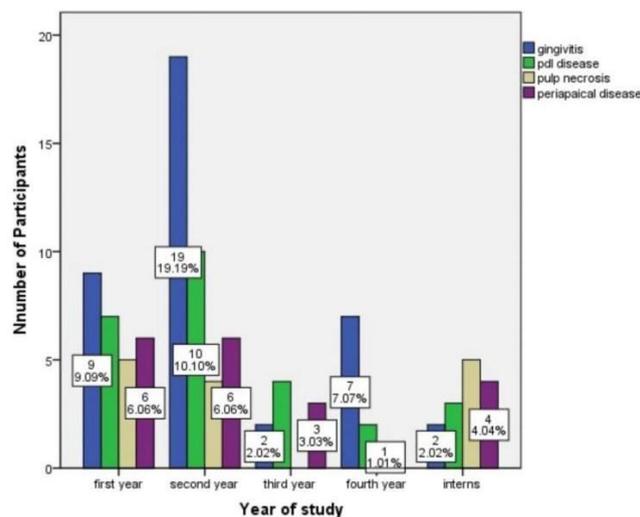


Figure 8 - Bar chart showing the association of responses based on the academic year of dental college students with the knowledge of the respondents on the fixed partial dentures susceptibility. X axis represents the academic year of dental college students and Y axis represents the number of respondents of which blue colour represents “gingivitis”, green colour represents “pdl disease”, brown colour represents “pulp necrosis” and purple colour represents “periapical disease”. Majority of the respondents studying in second year (19 participants) responded that fixed partial dentures are susceptible to gingivitis. The Pearson Chi square test was done. (Chi square value - 18.005 ; p value - 0.116(>0.05) hence not significant)

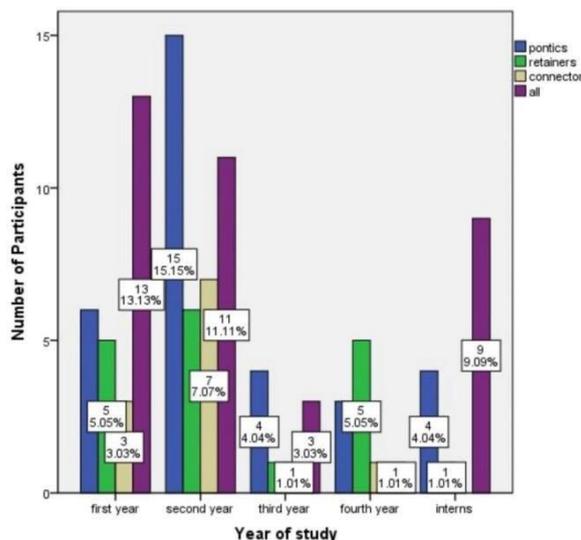


Figure 9 - Bar chart showing the association of responses based on the academic year of dental college students with the knowledge of respondents regarding the parts of fixed partial dentures. X axis represents the academic year of dental college students and Y axis represents the number of respondents of which blue colour represents “pontics”, green colour represents “retainers”, brown colour represents “connector” and purple colour represents “all”. There is no significance with the year of study and the knowledge about fixed partial dentures among participants. The Pearson Chi square test was done. (Chi square value - 18.047; p value - 0.114 (>0.05) hence statistically not significant).

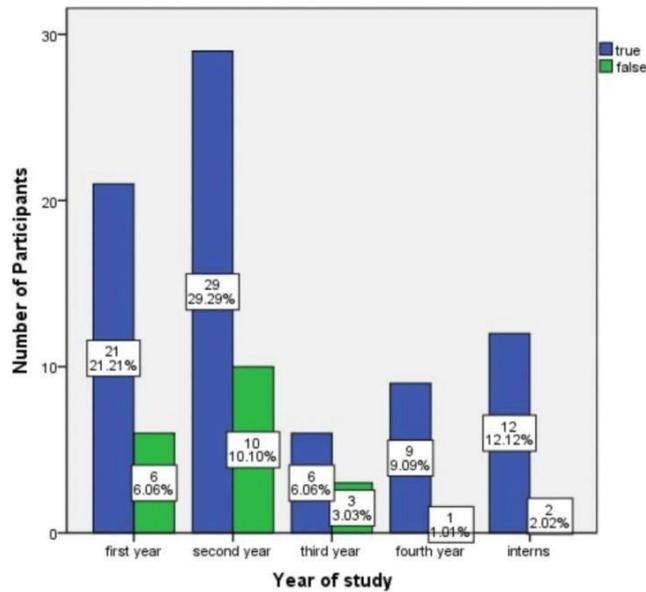


Figure 10 - Bar chart showing the association of responses based on the academic year of dental college students with the basic knowledge regarding the function of fixed partial dentures . X axis represents the academic year of dental college students and Y axis represents the number of respondents of which blue colour represents “true” the fixed partial denture replaces the missing tooth and green colour represents “false”the fixed partial denture does not replace the missing tooth. Majority of the second years have good knowledge about the fixed prosthodontics compared to other academic years.. The Pearson Chi square test was done. (Chi square value -2.281; p value - 0.684 (>0.05) hence not significant).

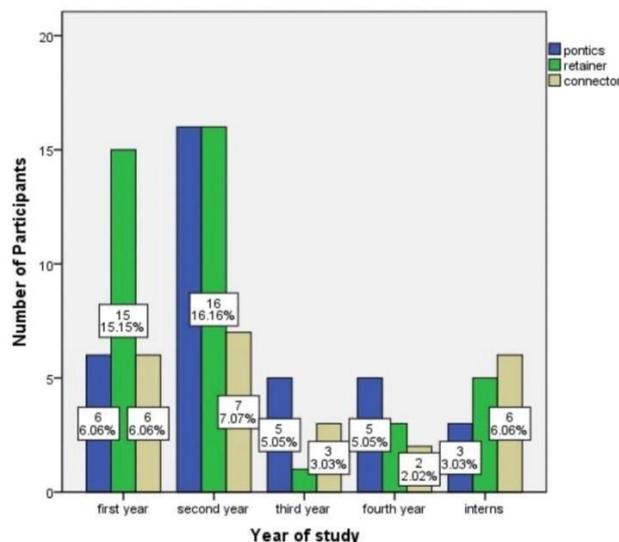


Figure 11 - Bar graph showing the association of responses based on the academic year of dental college students with the knowledge of respondents regarding the artificial tooth on fixed partial dentures. X axis represents the academic year of dental college students and Y axis represents the number of respondents of which blue colour represents “pontics”, green colour represents “retainers” and brown colour represents “connector ”. Majority of the respondents studying in second year (16 participants each) responded to the artificial tooth on fixed partial denture is pontics and retainers. The Pearson Chi square test was done. (Chi square value - 10.944; p value - 0.205 (>0.05) hence not significant).

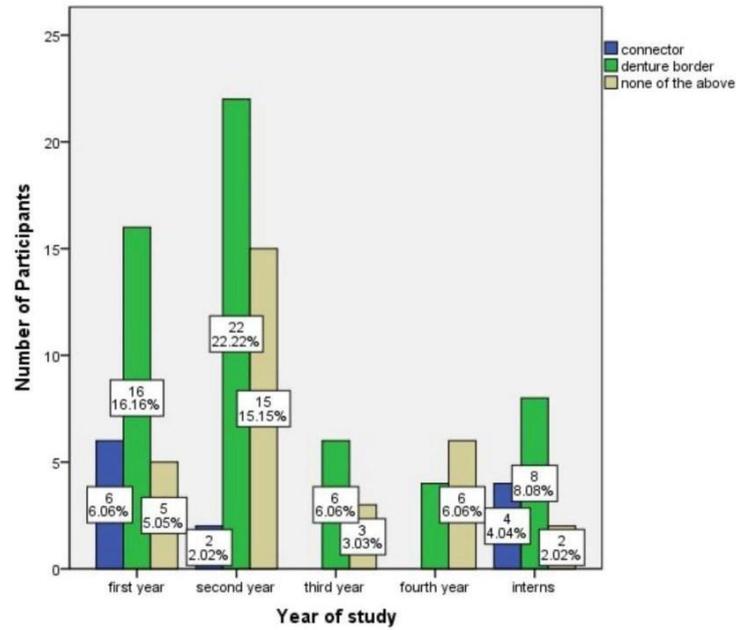


Figure 12- Bar chart showing the association of responses based on the academic year of dental college students with the knowledge regarding retainers and pontics in fixed prosthodontics. X axis represents the academic year of dental college students and Y axis represents the number of respondents of which blue colour represents “connector”, green colour represents “denture border” and brown colour represents “none of the above ”. Majority of the respondents studying in second year lack knowledge regarding retainers and pontics. The Pearson Chi square test was done. (Chi square value - 15.942; p value - 0.043(<0.05) hence statistically significant)