

## KNOWLEDGE ATTITUDE AND PRACTICE SURVEY ON FINISHING AND POLISHING OF ANTERIOR COMPOSITE RESTORATION AMONG UNDERGRADUATE DENTAL STUDENTS

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### ABSTRACT:

**AIM:** The main aim of this study was to assess the knowledge, attitude and practice of undergraduate dental students in finishing and polishing of anterior composite restorations.

**MATERIALS AND METHODS:** A cross sectional questionnaire based study was conducted among 100 dental students in Saveetha dental college. The questionnaire contained 11 questions which were circulated through Google forms. The collected data were analysed using SPSS software and statistical analysis was done (Descriptive statistics and Chi square analysis).

**RESULTS:** From this survey it is seen that majority of the students participated were interns (41%) followed by final year (30%) and third year students (29%).(33%) uses fine diamond finishing bur, (31%) uses number 12 finishing blades, (22%) uses carbide burs and only (14%) prefer fine diamond finishing bur. (53%) of them responded that Soflex discs produces smooth restorative surface while (27%) responded to astropol, (12%) to enhance and (8%) to diacomp. (71%) respondents felt it is essential to use polishing paste, (29%) responded it is not essential to use polishing paste. There was a significant difference in the responses among different years of study ( $p < 0.05$ ).

**CONCLUSION:** Undergraduate students were moderately aware of the benefits of proper finishing and polishing of composite restorations. They however need to use finishing and polishing burs, disks, strips and pastes in a sequential series. A more detailed knowledge on composite finishing and polishing should be emphasized in undergraduate curriculum.

**KEYWORDS:** Composite; Finishing; Polishing; Survey; Esthetics, innovative technique.

### INTRODUCTION:

Unaesthetic teeth due to hypoplasia, fluorosis, fractures, caries and developmental disturbances can be treated using various esthetic techniques such as bleaching, esthetic contouring, composite restorations, porcelain and composite laminate veneering. Increasing demand for esthetic dentistry has been coupled with a rapid rate of development of new restorative resin-based materials (1). One of the most important steps in successfully creating bonded restorations is contouring, finishing and polishing (2) Proper finishing and polishing are important steps in clinical restorative dentistry that enhance both esthetics and longevity of restorations. Residual surface roughness may result in excessive plaque accumulation, gingival inflammation and increased surface staining (3)-(4). Additionally, surface roughness may directly influence the wear behavior and marginal integrity of composite resin restorations (5)

A wide variety of finishing and polishing devices have been investigated, including coated abrasives such as diamond burs and aluminium oxide or silicon carbide finishing discs. Bonded abrasives, i.e, rubber or silicone compounds, and several polishing pastes containing fine-particle-size abrasives have also been recommended for polishing of composite resins.(6) Different finishing/polishing techniques and devices are available for the different categories of resin-based materials and types of restorations. For hybrid and microfilled composite resins, for example, aluminum oxide discs and rubber polishing systems have been suggested as the standard protocol (7),(8). On the other hand, the high fillerload and the novel matrix and filler formulations of packable composite resins have been shown to influence their ability to be polished (9)-(10)

Dentists' treatment decisions are influenced by their knowledge toward care options and assessing these is worthwhile (11). Composite resins are the most popular and commonly used aesthetic restorative materials and the key to beauty and biologic integrity of these long-term restorations lies in the final steps of the procedure. Our team has extensive knowledge and research experience that has translate into high quality publications(12–21),(22–25),(26–30),(31). The main aim of this study was to assess the knowledge and practice of undergraduate dental students in finishing and polishing anterior composite restorations.

**MATERIALS AND METHODS:**

This cross sectional questionnaire based study was conducted among UG dental students in Saveetha dental college. A pre-piloted questionnaire consisting of 11 questions was distributed among 100 dental students. The questionnaires were circulated through Google forms. The collected data were analysed using SPSS software Version 22.0 and statistical analysis (Descriptive analysis and Chi square tests) were done. If the questionnaire was not filled completely it was excluded. Each data was collected as an ordinal data and Chi square analysis was performed. This original study protocol was reviewed and approved by the research ethical committee of Saveetha Dental College and Hospitals, Chennai, Tamilnadu, India.

TABLE-1 : Questions in the questionnaire with their responses

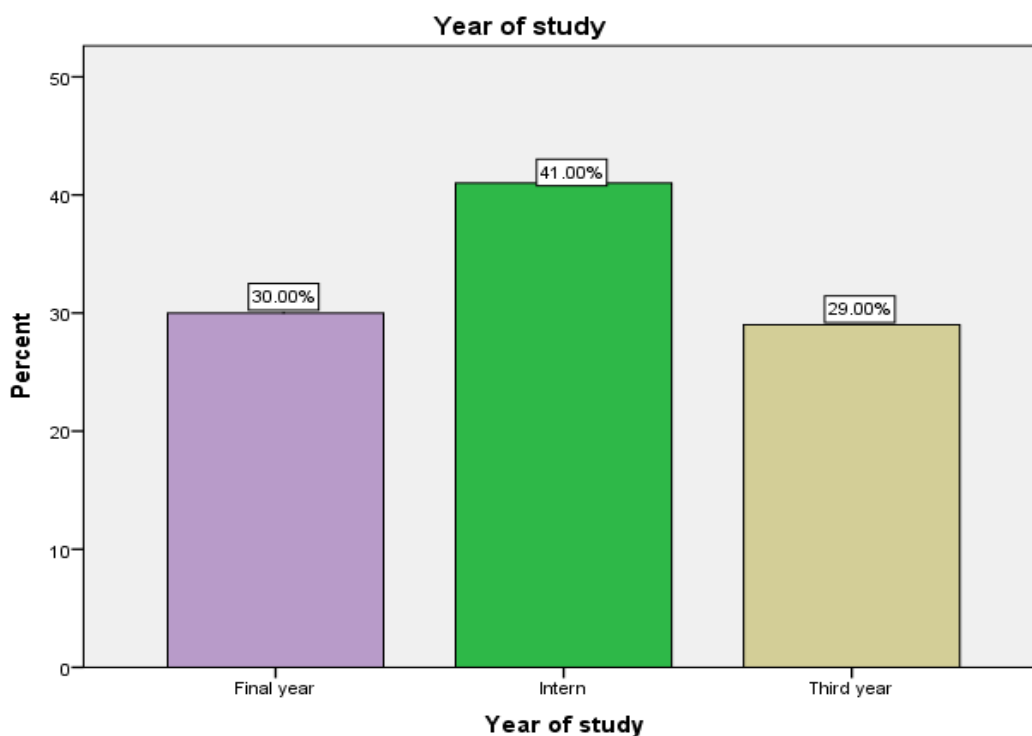
QUESTIONS	RESPONSES	PERCENTAGE
1)Year of study?		
Third year	29	28.7%
final year	30	29.7%
Interns	42	41.6%
2)Does the type of composite play a vital role in colour stability?		
Yes	97	96%
no	4	5%
3)Which of the following factors have a major influence in providing colour stability?		
Type of filler	77	76.2%
Resin chemical composition	19	18.8%
intensity of polymerisation light	4	
intensity do polymerisation light	1	
4)Do you replace composite restoration solely due to colour change?		
No	23	22.8%
yes	35	34.7%
maybe	43	42.6%

5) Is colour stability of significant concern while providing composite restoration?		
Yes	85	84.2%
No	16	15.8%
6) Does the finishing and polishing procedure play a crucial role in colour stability of composite restorations?		
Yes	75	74.3%
No	26	25.7%
7) Which among these polishing systems produces the smoothest restorative surface?		
SofLex discs	51	52%
Astropol	27	27.6%
Enhance	12	12.2%
Diacomp	8	8.2%
8) Does improper finishing and polishing increase the susceptibility to staining?		
Yes	93	94.9%
No	5	
9) What is your method of choice in finishing interproximal anterior surfaces?		
No 12 finishing blade	31	30.7%
Fine diamond finishing burs	34	33.7%
Carbide finishing burs	22	21.8%
Fine diamond finishing strips	14	13.9%

10)Is it essential to use composite surface sealants?		
Yes	84	83.2%
No	17	16.8%
11)Is it essential to use composite polishing paste?		
Yes	72	71.3%
No	29	28.7%

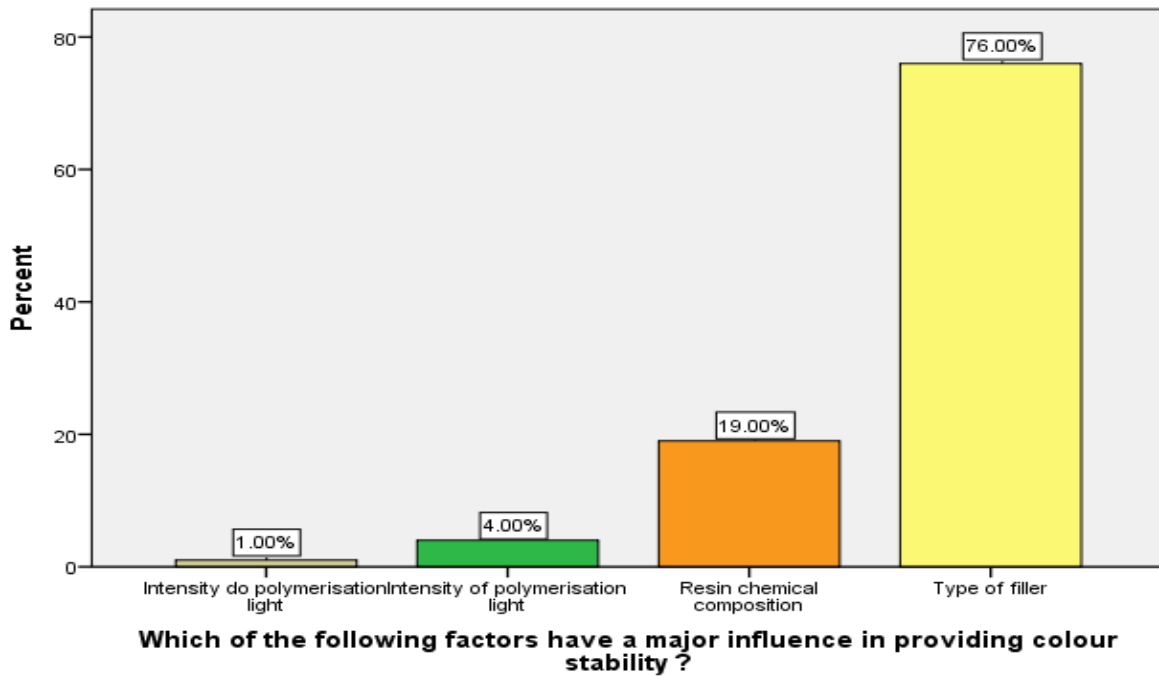
**RESULTS:**

The results are presented in the form of table and graphs.



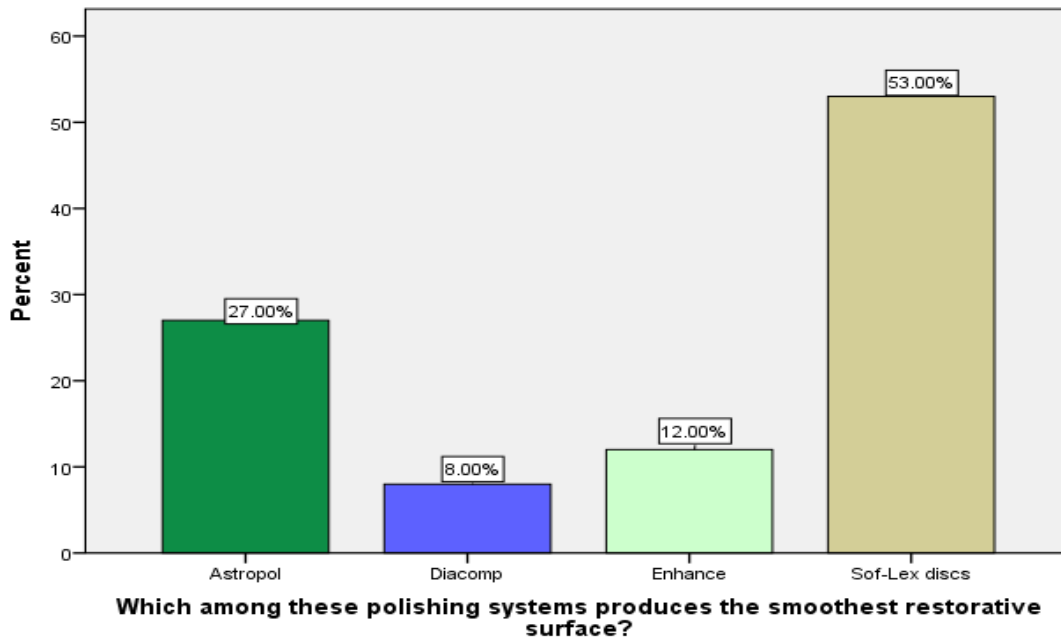
**Graph 1:** Bar diagram shows the percentage distribution of year of study of the participants. X axis represents the year of study; Y axis represents the percentage of responses. It is shown that the majority of the students participated were interns with 41% (green) followed by final years with 30% (purple) and third year students with 29% (beige)

**Which of the following factors have a major influence in providing colour stability?**

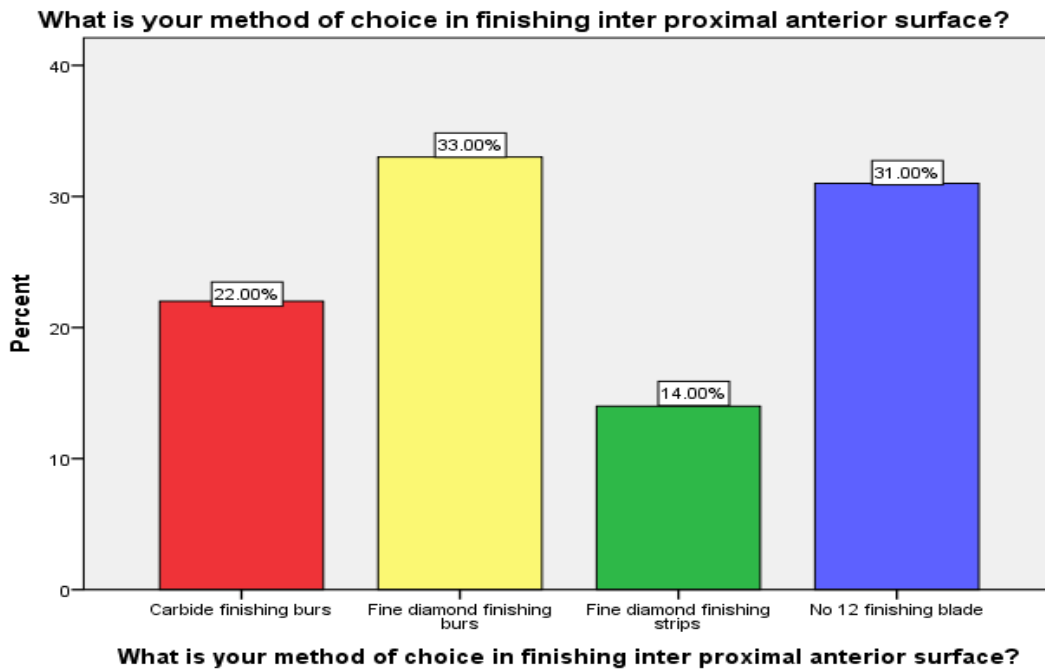


**Graph 2 :** Bar diagram shows the percentage distribution of factors influencing the colour stability in composite restoration. X axis represents the factors influencing colour stability and Y axis represents the percentage of responses. Nearly 76% of the respondents responded as type of filler material (yellow) and the least responded to intensity of polymerisation light 1% (beige). 19 % responded as chemical composition of resin (orange) while 4% responded it to be the intensity of polymerisation light (green)

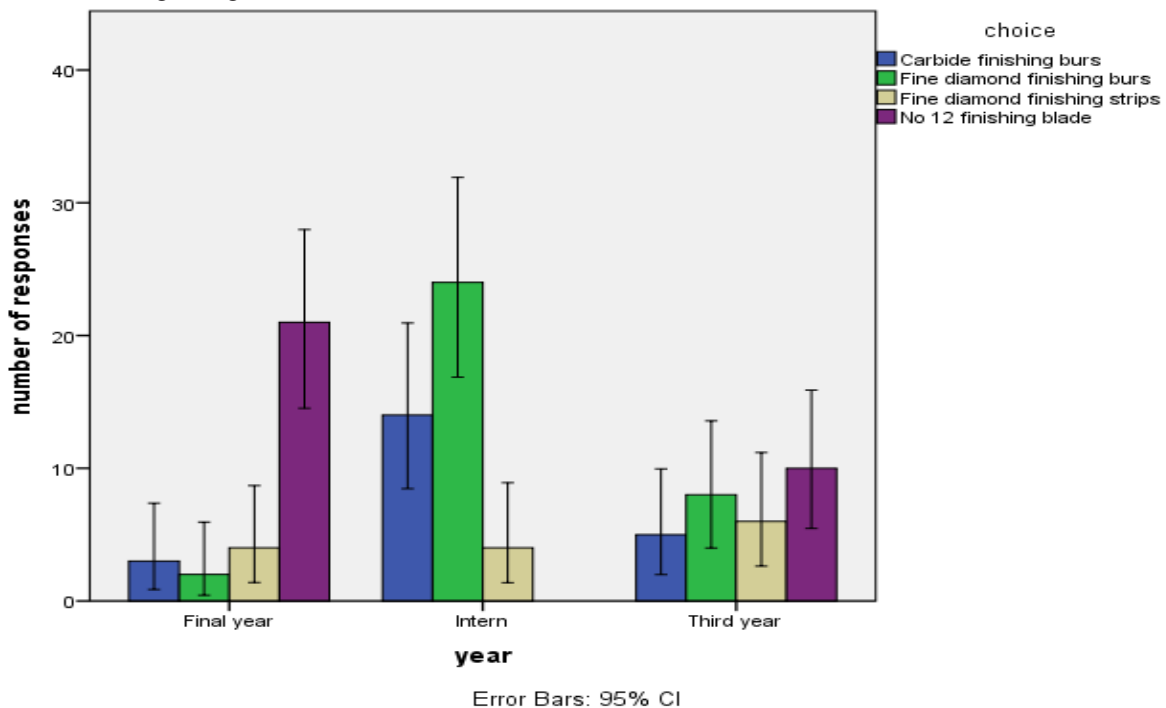
**Which among these polishing systems produces the smoothest restorative surface?**



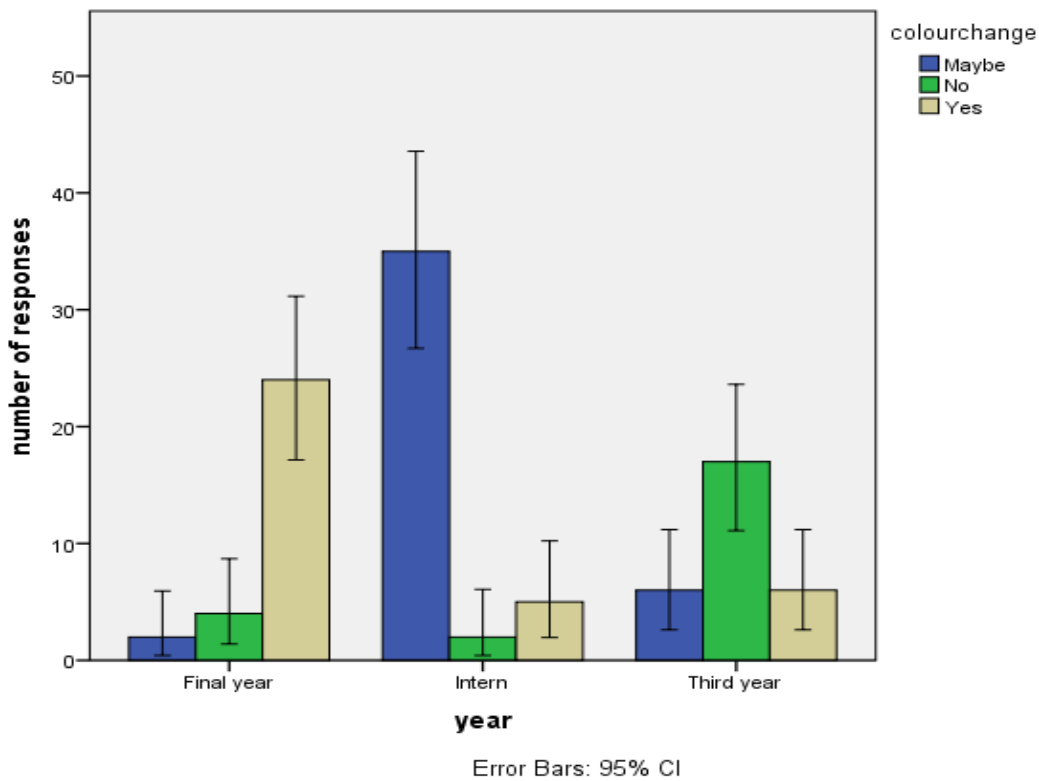
**Graph 3:** Bar diagram shows the distribution of polishing systems that produces smooth restorative surfaces. X axis represents the different polishing systems and Y axis represents the percentage of responses. 53% selected Soflex discs (beige) while 27% selected Astropol (green), 12% selected Enhance (light green) tand 8% Diacomp (blue) .



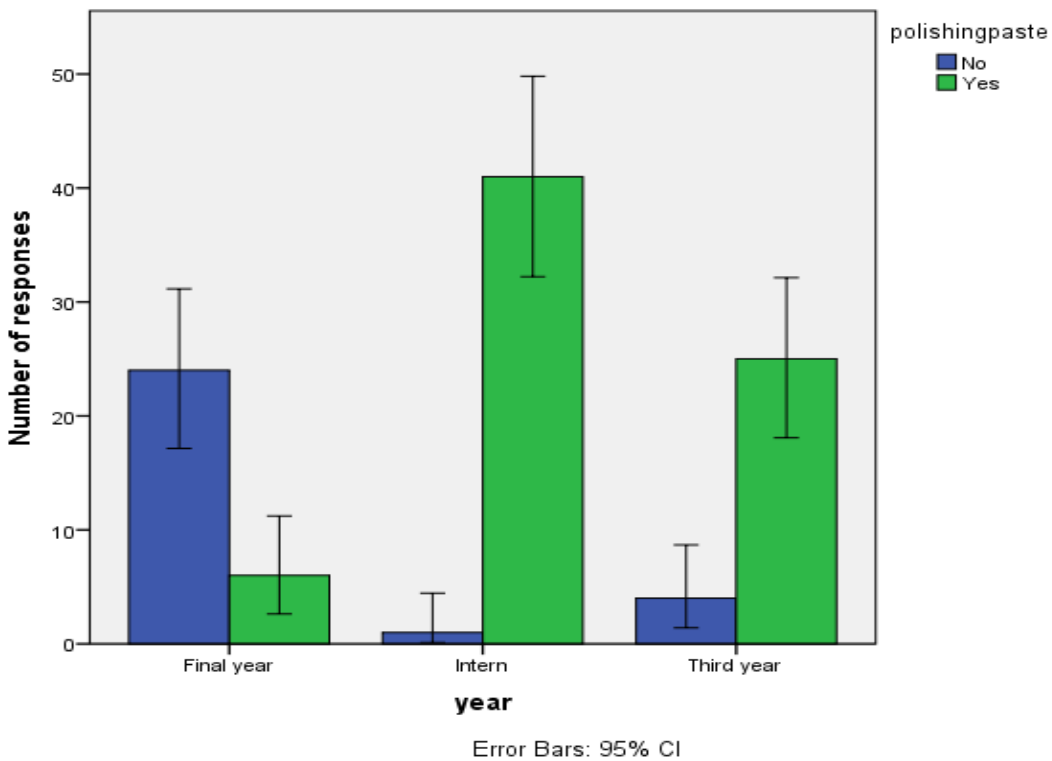
**Graph 4:** Bar diagram shows the percentage distribution for choice in finishing inter proximal anterior surface. X axis represents method of choice for finishing and Y axis represents percentage of responses. 33% used fine diamond finishing bur (yellow), 31% used number 12 finishing blades (blue) , 22% used carbide burs (red) and only 14% preferred fine diamond finishing bur (green).



**Graph 5:** Bar diagram shows the association between year of study and method of choice in finishing inter proximal anterior surface. X axis denotes the year of the study and Y axis denotes the number of responses. Blue colour represents Carbide finishing burs, Green colour represents Fine diamond finishing burs, Beigecolour represents Fine diamond finishing strips and Purple No.12 finishing blade. Majority of Third and Final years chose No.12 finishing blade while the Interns chose fine diamond finishing burs. This difference was statistically significant (Chi square P value= 0.029<0.05 which is statistically significant).



**Graph 6:** Bar diagram shows the association between year of study and response to whether the participants replace composite restorations due to solely colour change. X axis denotes the year of the study and Y axis denotes the number of responses. Blue colour represents maybe, green colour represents no and beige represents yes. Majority of the interns responded that they may change the composite while the Third and Final years responded no and yes, respectively. This difference was statistically significant (Chi square P value= 0.05 which is statistically significant).



**Graph 7:** Bar diagram shows the association between year of study and response to whether it is essential to use composite polishing paste. X axis denotes the year of the study and Y axis denotes the number of responses. Blue colour

represents no and green colour represents yes. Majority of the interns and third years responded yes while the final years responded no. This difference was statistically significant (Chi square P value= 0.01<0.05 which is statistically significant).

#### **DISCUSSION:**

From this survey **Graph 1** represents the majority of the students participating were interns (41%) followed by final year (30%) and third year students (29%). Colour stability of the composite resin materials is related to type of the composite resin restorative materials and polishing procedures. In **Table 1** Majority of the respondents felt that the type of composite plays a vital role in colour stability (96%). A Dutch study concluded that, staining or discoloration was one of the primary reasons for replacement of composite restorations (15) **Graph 2** denotes the factor that has a major influence in providing colour stability to the composite restoration (76%) of the respondents responded to type of filler material and with the least responded to intensity of polymerisation light (1%). In **Table 1** Most of the participants (42%) responded that they might change the composite restoration due to colour change and (23%) responded they wouldn't change the restoration. Discoloration of composite restorations is caused by intrinsic and extrinsic factors. The intrinsic factors involve the discoloration of the resin material itself, such as the alteration of the resin matrix and of the interface of matrix and fillers. Extrinsic factors include staining by adsorption or absorption of colorants as a result of contamination from food and beverages. In **Table 1** (95%) of the respondents felt that finishing and polishing causes staining and only (5%) responded polishing doesn't cause any staining. Manufacturers provide a variety of instruments to accomplish finishing and polishing, such as diamond rotary cutting instruments, carbide burs, abrasive-impregnated rubber cups and points, abrasive disks and polishing pastes (16). Different types of composites call for different polishing techniques and various studies have reported that dedicated polishing systems and procedures are needed to create the kind of surface smoothness that prevents early discoloration. **Graph 4** (33%) uses fine diamond finishing bur, (31%) uses number 12 finishing blades, (22%) uses carbide burs and only (14%) prefer fine diamond finishing bur.

In **Graph 3** (53%) of them responded that Soflex discs produces smooth restorative surface while (27%) responded to astropol, (12%) to enhance and (8%) to diacomp. (83%) of the respondents felt it is essential to use composite surface sealants, (17%) responded that surface sealants are not essential for the composite restoration. In **Table 1** nearly (71%) respondents felt it is essential to use polishing paste, (29%) responded it is not essential to use polishing paste. **Graph 5** represents the association between year of study and method of choice in finishing inter proximal anterior surface in which the majority of the interns choose fine diamond finishing burs while the least uses carbide finishing burs. **Graph 6** shows the association between year of study and replacement of composites due to colour change where the majority of the interns responded that they may change the composite while the least responded that they won't change the composite due to colour change. **Graph 7** represents the association between the year of study and whether it is necessary to use composite polishing paste where Majority of the interns and third years responded yes while the final years responded no. Although long-term studies are not currently available to discuss the efficacy of composite surface sealants, short-term studies have shown that microcracks caused by the trauma of finishing procedures are resealed. Microcracks particularly at the cavosurface margins can propagate overtime, hence it is logical that the use of surface sealants postoperatively decrease the surface wear and increase the longevity of direct resin restorations. The limitations of the study includes limited sample size and geographical limitation. The future scope is to increase the sample size and analyse other aspects in finishing and polishing procedures for various composite restorations at the undergraduate curriculum.

#### **CONCLUSION:**

Within the limitations of the present study it is seen that the Undergraduate students were moderately aware of the benefits of proper finishing and polishing of composite restorations. They however need to use finishing and polishing burs, disks, strips and pastes in a sequential series. A more detailed and uniform knowledge on composite finishing and polishing should be emphasized in undergraduate curriculum.

#### **FUNDING SOURCE:**

**The present study was supported by the following agencies.**

.Saveetha Dental College

.SIMATS, Saveetha University

.V-care physiotherapy clinic Tuticorin

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