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**Dr. B Eswaran MDS**  
Thai Moogambigai Dental  
College and Hospital, Chennai,  
Tamil Nadu, India

**Arputha Madhalan C**  
Department of Prosthodontics,  
Thai Moogambigai dental college  
and hospital, Chennai, Tamil  
Nadu, India

**Karishma Chowdary MV**  
Department of Prosthodontics,  
Thai Moogambigai Dental  
College and Hospital, Chennai,  
Tamil Nadu, India

## Knowledge, awareness and practice of resin cements among dental students and practitioners

**Dr. B Eswaran MDS, Arputha Madhalan C and Karishma Chowdary MV**

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### Abstract

**Background:** Resin cement has now been widely used as luting agent for prosthetic replacement. Dental luting agents provides a bridge between prepared tooth and the prosthesis through mechanical, micro mechanical, chemical or combination. A very few studies has been done regarding the awareness of resin cement among dental students. This article is aimed to study the knowledge and awareness about resin cements among undergraduate students, postgraduate students and private practitioners.

**AIM:** The aim of this study was to access the awareness, knowledge of resin cements among dental undergraduate and post-graduate students and private practitioner of Tamil Nadu.

**Methodology:** The questionnaire was formulated with demographic features. A total of 156 students were participated in this study out of which 83% are undergraduates and 16% are private practitioner and the exclusion criteria includes 1st year students.

**Results:** The results shows 84.6% of participants are aware of resin cements and 10.3% were not sure about it. 74% of participants corrected answered that resin cement are used for orthodontic brackets, to bond fixed prosthesis and inlay and onlay. 66% of participants are aware that resin cements are available in various shades.

**Conclusion:** This study established the knowledge and awareness concerning the usage and clinical applications of resin bonded agents was inadequate among people especially among undergraduate students. So to conclude the institutions should educate the students about resin cements and to implement the use of resin cements clinically may increase the knowledge and awareness about resin cements.

**Keywords:** Resin, cement, luting, self-adhesive, bonding

### 1. Introduction

The success of the fixed prosthodontics restoration has many factors such as preparation design, oral hygiene maintenance, mechanical forces and restorative materials. However proper retention of the prosthesis is important for the success, the proper luting agent and cementation procedure to be used <sup>[1]</sup>. There is no proper luting agent to meet all the requirements of successful prosthetics. Hence the contemporary adhesive resin cements were introduced which is widely used for bonding all ceramic crowns and resin-retained fixed partial denture. Dental luting agents provides a bridge between prepared tooth and the prosthesis through mechanical, micro mechanical, chemical or combination <sup>[2]</sup>. This study was to access the awareness and knowledge about the resin cements among the dental students and private practitioner.

### 2. Materials and Methodology

A total of 21 questions with demographics were formulated and distributed to 180 students out of which 156 students responded. The opinion of the dental students regarding awareness about resin cements were obtained. The inclusion criteria were the under graduate dental students, post-graduation students and private practitioners. Since this survey were conducted during covid-19 pandemic, the questionnaire was prepared in the google form and circulated among the WhatsApp groups of dental students through which responses are collected. Results were analysed, tabulated and published.

**Corresponding Author:**  
**Dr. B Eswaran MDS**  
Thai Moogambigai Dental  
College and Hospital, Chennai,  
Tamil Nadu, India

**2.1. Inclusion criteria**

1. Undergraduate students from 2<sup>nd</sup> year to final year
2. Post graduate students, Interns, dental professionals

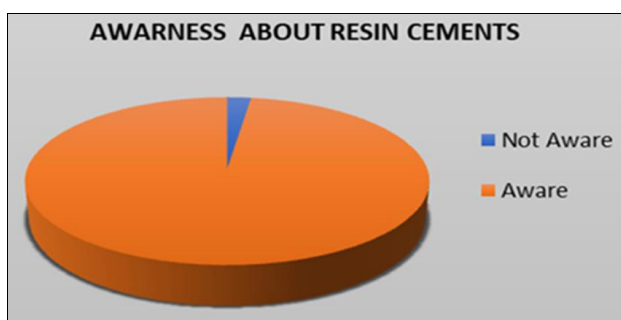
**2.2. Exclusion criteria**

1. Students not exposed to clinical practice
2. Those who are unwilling to participate

**3. Result**

**A) Demographic data**

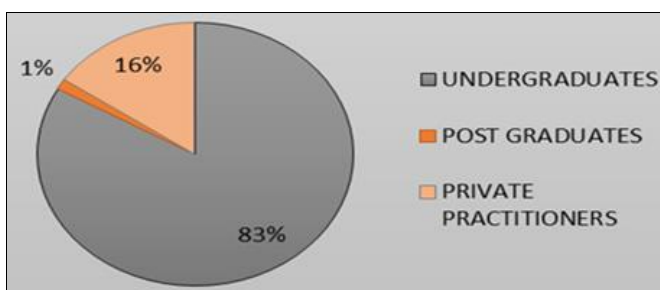
The filled questionnaires obtained were analysed on MS excel and charts were formulated for easy depiction of the results. The survey were conducted for 156 people out of which 31% Male and 69% Female. Among 39.1% are people in internship phase, 19.3% from 3rd year, 15.4% are private practitioner and the rest were 4th and 2nd years (**Graph 1**).



**Graph 1:** Graph showing the distribution of the study population

**B) Awareness about resin cements:**

84.6% of participants were aware about the resin cements(**Graph 2**). About three fourth of the people know that resin cement are used to bond fixed prosthesis to abutment, orthodontic brackets and inlay and onlay.



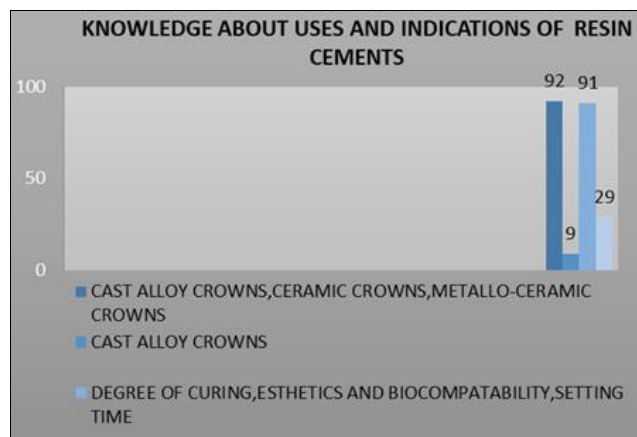
**Graph 2:** Graph showing the awareness towards resin cements

**C) Knowledge and practice towards resin cements**

A total of 110 participants were aware that resin cement are classified based on adhesion and polymerization, whereas only 23.1% of people marked chemical cure under polymerization based and 25.6% of people marked self-adhesive resin under adhesion based resin cement.

The pH value of the resin cement raises from 2.5 to 7 during setting and a total of 82 participants are aware of it whereas 39 participants are not sure about it. All the options which are aesthetics and biocompatibility, setting time and degree of curing are advantages of resin cements. 91 participants answered correct whereas 29 participants thought aesthetics and biocompatibility is the only advantage(**graph 3**). A total of 92 students were sure that resin cements are for cast alloy crowns, ceramic crowns and metal ceramic crowns. 97% of participants are aware that resin cements are contraindicated in root surface area, sub-gingival area and in patient having bruxism habit.

Various shades of resin cements are available and hence it is considered as aesthetic cement and 66% of people are aware of it. 46.2% of participants answered that the drawback of resin cement are polymerization shrinkage, manipulation and colour instability. A total of 41.7% of participants are aware that bond strength of self-adhesive resin cement is 22-34Mpa. The bonding strength is reduced if it is used on infected or affected dentin and 50.6% of people are aware of it. The excess resin cement can be removed after two minutes of initial setting. 69 participants are aware of it and 44 participants were wrongly answered that before the initial setting. A total of 87 participants answered the excess cement can be removed by hand instrument, dental floss and cotton pellet.



**Graph 3:** Graph showing the knowledge of uses and indication of resin cement

**4. Discussion**

Resin cements are widely used in restorative dentistry due to their high mechanical and aesthetic properties for luting definitive or provisional or implant abutment [3]. The prime purpose of a dental cement is to fill the space between restorative materials and tooth preparation and to enhance the resistance to restoration displacement during function [3, 4]. Moreover, 74.4% of students aware of the use of resin cements is for Inlay and only and to bond fixed prosthesis.

Resin cements were introduced in the 1970s [6]. They form a polymeric matrix that could ultimately fill and seal any gap at the tooth and restoration interface. They are based on BIS-GMA resin and other methacrylate's, which are modified from the composite resin. The long-term success of a restoration is comprehensively dependent on the appropriate selection and handling of dental cements. These cements have a setting reaction based on polymerization and adhesion [5]. Resin cements can be classified according to the process of matrix formation and adhesive technique that the types are self-cured, light cured, and dual cure. Self-cured and dual-cured resin cements can be applied for all restorations. But light-cured resin cements should be restricted to porcelain veneers and glass-ceramic restorations which permit the curing light to infiltrate the porcelain

Resin cements have the advantage of higher compressive strength, tensile and bonding strength and low solubility, highly esthetics in nature. Loss of retention and polymerization shrinkage has been found to be one of the most frequent causes of restoration failure. Certain resin cements have ytterbium trifluoride or barium aluminum fluorosilicate filler and are adept of releasing fluoride after setting stage. These cements have cariostatic capacity [7].

The prime advantage of these cements was its low solubility.

All resin cements are relatively insoluble when related to the dental cements. This type of cements has a more tooth-like translucency. To increase the simplicity of use. In 2002 self-adhesive resin cements were developed. These cements do not require surface pre-treatment and bonding agents to maximize their performance<sup>[9]</sup>. So they are technique sensitive and self-adhesive resin cement is significantly reduced when compared to the conventional resin cements<sup>[8]</sup>.

For the self-etch systems, the acid etching and bonding steps are replaced with the self-etch bonding agent application, which is a combination of the conditioner, primer, and adhesive<sup>[10]</sup>. Resin cements are indicated in cast alloy crowns, ceramic crowns metallo-ceramic crowns, short-span fixed partial denture, long-span fixed partial denture, traditional feldspathic or pressable all-ceramic restorations, alumina or zirconium based all-ceramic restorations, fiber post, Maryland bridge, and composite and porcelain veneer and resin cements are contraindicated in Habits(Bruxism), Root Surface Area, Sub-gingival Area and also in all-metal and in porcelain fused to metal crowns, metal post and core.

## 5. Conclusion

To accomplish, this study presents a unique comparison of data designed to evaluate the knowledge and perception of resin cements among dental students and the private practitioners. This study established the knowledge and awareness concerning the usage and clinical applications of resin bonded agents was comparatively less among people especially among undergraduate students. The clinical experience among students seems to be varied among the year of study and different colleges based on their locality like urban, sub-urban and rural areas. So to conclude the students should explore and gain more knowledge about resin cements and to implement the use of resin cements clinically to acquire and increase the clinical knowledge about resin cements.

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