Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15507 - 15515
Received 05 March 2021; Accepted 01 April 2021.

Awareness of Flexible Dentures among Dental Undergraduates.

S.S.SHIVANNI
Graduate Student,
Department of Prosthodontics
Saveetha Dental College, Saveetha Institute Of Medical and Technical Sciences
Chennai

REVATHI . D
Senior Lecturer ,
Department of Prosthodontics
Saveetha Dental College, Saveetha Institute Of Medical and Technical Sciences
Chennai

DHANRAJ GANAPATHY
Professor and Head ,
Department of Prosthodontics
Saveetha Dental College, Saveetha Institute Of Medical and Technical Sciences
Chennai

Corresponding Author
DHANRAJ GANAPATHY
Professor and Head ,
Department of Prosthodontics
Saveetha Dental College, Saveetha Institute Of Medical and Technical Sciences
Chennai
Email: dhanrajmganapathy@yahoo.co.in

ABSTRACT-

AIM: The aim of this study is to assess the awareness and practice of flexible dentures among dental undergraduates.
MATERIALS AND METHODS: A questionnaire containing 12 questions was given to the selected persons and responses were obtained and analyzed using descriptive statistics. A total of 100 participants were included in the study.
RESULTS: 83% of the dentists were aware about flexible dentures, 23% of the dentists have never given a flexible denture to their patients, 77% of the dentists have never given a flexible denture to their patients, 11% of the dentists knew the advantages and disadvantages of flexible

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15507 - 15515
Received 05 March 2021; Accepted 01 April 2021.

dentures, 78% of dentists think that flexible dentures are aesthetic than regular dentures, 81% of the dentists say that flexible dentures are more comfortable than regular dentures, 31% of the dentists think that flexible dentures are prone to more bacteria build up, 92% of dentists prefer that knowledge about flexible dentures should be increased in undergraduate courses, 86% of the dentists will advise their patients about flexible dentures in future.
CONCLUSION: This study shows that the majority of dentists are not aware about flexible dentures. This shows the need to conduct workshops and increase the content about flexible dentures in textbooks.
KEYWORDS: Awareness, advantages, aesthetic, bacterial build up, comfortable, flexible dentures.

INTRODUCTION-

The Glossary of Prosthodontics defines a complete denture as a removable dental prosthesis that replaces the entire dentition and associated structures of the maxilla or mandible and a denture base as the part of the denture that rests on the foundation and to which teeth are attached.(Phoenix, 1996)
A complete denture is prosthesis is composed of artificial teeth-ceramic or acrylic resin, attached to a rigid denture base. The denture base, in turn, derives its support from the underlying residual alveolar bone and oral mucosa, teeth, and/or implants. Since the removable complete denture prosthesis derives no fixed support from the supporting structures the support derivation is based on the philosophy of maximum coverage or the snowshoe concept. For a snowshoe concept to be effectively employed, the rigidity of the denture base becomes an essential commodity.(‘Glossary of prosthodontic terms’, 1987)
History reveals that denture bases were formed from a variety of materials, including wood, bone, ivory, gold, silver, porcelain, vulcanite, etc. In the past, a custom fabricated of denture base that can fit perfectly in the oral cavity was, in fact, a luxury that was available only to wealthy and powerful men. Ivory dentures were much esthetic but had to be carved to customize the fitting surface. Gold and silver denture bases were frequently used because of their ability to be formed by cold working due to their ductility and malleability. However, like ivory they were again luxury items and not everyone could have afforded it.(Johnson, 1959)
The basic requirement for a denture base is rigidity. Although individual denture bases may be formed from metals or metal alloys, the majority of denture bases are fabricated using common polymers. Such polymers are chosen based on availability, dimensional stability, handling characteristic, color, and compatibility with oral tissues.(Moore, 1993)
The modern denture base materials can be broadly classified into three groups, namely acrylic resin denture bases, metallic denture bases, and thermoplastic resin denture bases. The most popular of all is the acrylic or the PMMA resin which remains the preferred material for removable complete and partial prostheses. Various modified and improved forms of PMMA resins are available in recent pasts, and there has been more than one way to fabricate a

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15507 - 15515
Received 05 March 2021; Accepted 01 April 2021.

satisfactory denture base using PMMA resins. For example, urethane dimethacrylate, a derivative of the acrylic-based material can be cured by blue light and offers much more flexibility in fabrication. Polymerization of PMMA is based on chemical interaction between the monomer and polymer in the presence of an activator and an initiator. Activation can be by means of heat, light, or a chemical agent. All these three types of acrylic resins pass off very easily for a denture base material in terms of rigidity, esthetics, and economics.(Rueggeberg, 2002)

Thermoplastic resins or nylon-based polymers are the third group of contemporary polymers that are commonly used for denture base fabrication. Thermoformed polymers differ from the acrylic in the manner that they can be formed by heating and injecting them into a mold. The rigidity of thermoplastic resins becomes questionable in thinner sections and hence, the philosophy of cross arch stabilization, and maximum force distribution may become obsolete. However, there are always some situations that demand a flexible denture base to be used. For example, a Kennedy's class 4 edentulous situation in a mandibular arch may not require much of load or stress-bearing capability. This, when combined with lingually tilted posterior remaining teeth, will pose serious trouble in construction of a metallic or acrylic denture base owing to severe lingual undercuts that may present in these patients. In such cases, a flexible thermoplastic base can be of help to fabricate a denture base that can flex and enter undercut and remain adapted to the tissues in close quarters after denture seating. This would not be possible if we use a metal or acrylic denture base, as the undercuts need to be blocked out or eliminated by grinding natural tooth structure that may predispose the teeth to dentinal hypersensitivity. Furthermore in places where a metallic clasp is not well accepted in terms of aesthetics, a thermoplastic resin extension can function like clasp. Since thermoplastic resins can be pigmented to vary the shades the denture base can be much more aesthetic compared to metallic bases.((Phillips and Skinner, 1991; Rueggeberg, 2002)

Over the years, development of base material, e.g. Polymethyl methacrylate (PMMA) and metal framework, e.g. cobalt chromium has been progressive with various improvements in strength, appearance, ease of processing to name a few. However, some shortcomings of the materials particularly the popular PMMA, for example weaker flexural and impact strength compared to cobalt chromium which lead to fracture of the base plate(Soygun, Bolayir and Boztug, 2013); the difficulty in insertion of the denture constructed by these material when there is presence of undercut areas on the residual ridges and allergy to methyl methacrylate monomer.(Singh *et al.*, 2011) Therefore, thermoplastic resins were introduced in the 1950s and has become a popular choice among dentists and patients in denture construction as it offers two advantages of aesthetic and flexibility. Thus, flexible dentures have become an alternative denture that aid retention by ensuring

seal around the entire border of the denture. It is also referred as hypoallergenic denture especially for those who are allergic to methyl methacrylate monomer and metal. It exhibits lower flexural modulus than conventional baseplate material denture that makes it nearly unbreakable. Flexible denture also allows prostheses to follow the contour of the mouth without

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15507 - 15515
Received 05 March 2021; Accepted 01 April 2021.

interrupting the denture retention. However, flexible dentures are intended for provisional and temporary applications and not for long term usage.(Jamayet*et al.*, 2013) Patient's selection is rather important before prescribing flexible dentures.

Flexible denture is not taught extensively in the dental school in Malaysia. Therefore the level of knowledge of private dental practitioners regarding flexible denture is crucial to ensure a successful treatment outcome. Differences were shown between Greece and Croatia in terms of dentists providing removable partial dentures (RPDs). Although they were not taught in their schools about flexible RPDs, almost one third of them offer this treatment to their patients.((Jamayet*et al.*, 2013; Polyzois*et al.*, 2015)

Knowledge and perception of effectiveness in prescribing flexible dentures by PDPs in Malaysia are based solely on experiences, or patient personal oral feedback. Currently, knowledge and perceptions of dental practitioners on the effectiveness of prescribing flexible denture in Malaysia is not known yet. Hence, the objectives of the present study were to assess the knowledge on flexible denture among PDPs, to evaluate their perceptions on the effectiveness of flexible denture, and to evaluate the gender and year of experience among PDPs with knowledge and perception on flexible denture.Our research experience has prompted us in pursuing this survey (Hemalatha and Dhanraj, 2016)(Ramya, Pandurangan and Ganapathy, 2019)(Anjum, Ganapathy and Kumar, 2019; Inchara, Ganapathy and Kumar, 2019)(Philip, Ganapathy and Ariga, 2012)(Gupta and Dhanraj, 2009; Mohamed Usman*et al.*, 2013; Indhulekha, Ganapathy and Jain, 2018)(Ganapathy*et al.*, 2013)(Menon and Ganapathy, 2019).

MATERIALS AND METHODS-

This study was done to understand the level of knowledge, attitude, and practice of choice of permanent denture base materials among dental undergraduates. The study included undergraduates who are treating patients on a daily basis. Random sampling was done, and 100 interested participants were selected which included students. A questionnaire containing 12 questions was given to the selected persons and responses were obtained and analyzed using descriptive statistics.

RESULTS-

The survey was conducted among 100 dental practitioners. This sample size of this study is sufficient to give an idea of the current practice of management of flexible dentures. The results show that 83% of the dentists were aware about flexible dentures and 17% were not aware about flexible dentures (GRAPH 1). 77% of the dentists have never given a flexible denture to their patients, 23% have given flexible dentures at least once to their patients (GRAPH 2). 11% of the dentists knew the advantages and disadvantages of flexible dentures and 89% did not know the advantages and disadvantages of flexible dentures (GRAPH 3). 78% of dentists think that flexible dentures are aesthetic than regular dentures (GRAPH 4). 81% of the dentists say that

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15507 - 15515
Received 05 March 2021; Accepted 01 April 2021.

flexible dentures are more comfortable than regular dentures (GRAPH 5). 31% of the dentists think that flexible dentures are prone to more bacteria build up, 47% are not sure whether flexible dentures are prone to bacteria build up and 22% think that flexible dentures are not prone to bacterial build up (GRAPH 6). 92% of dentists prefer that knowledge about flexible dentures should be increased in undergraduate courses (GRAPH 7). 86% of the dentists will advise their patients about flexible dentures in future (GRAPH 8).

DISCUSSION -

More than 80% of dentists agreed that flexible dentures are more comfortable than regular dentures. This is agreeable with Thakral et al., and Sharma et al., which reported that patients felt more natural and comfortable to wear flexible dentures compared with conventional dentures.(Sharma *et al.*, 2014) Sharma et al., there was almost no load on the abutment tooth in flexible partial denture, thus no abutment tooth mobility observed as with conventional partial dentures. The flexibility of the major connector of the flexible denture itself may act as a stress breaker and lead to stress distribution.(Sharma *et al.*, 2014) This result was contradicted with the previous study that showed nylon based material had given patients' hope for better quality of life.(Singh *et al.*, 2011)

Most dentists agreed that flexible denture is more aesthetic than conventional denture as being suggested by Shamnur et al.,.(Sharma *et al.*, 2014) Flexible denture provided a metal free prosthesis and translucency of the material which picked up underlying tissue tones. However, it might show staining and discolouration with time as it was chromatic instability.

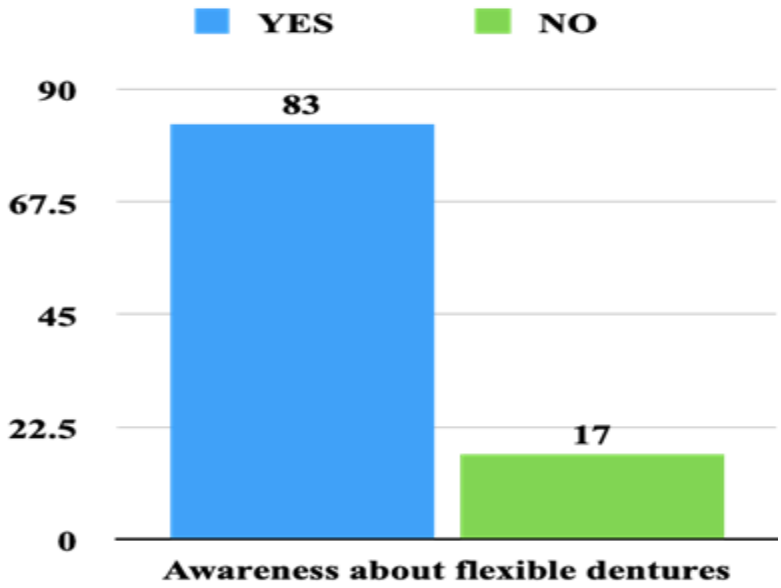
The limitation of this study was the small sample size which had 100 dental undergraduates as participants and in limited areas (Chennai). In future studies, larger surveys which recruit larger samples or subjects should be conducted in larger areas probably a state or country to achieve a significant result of this study.

CONCLUSION-

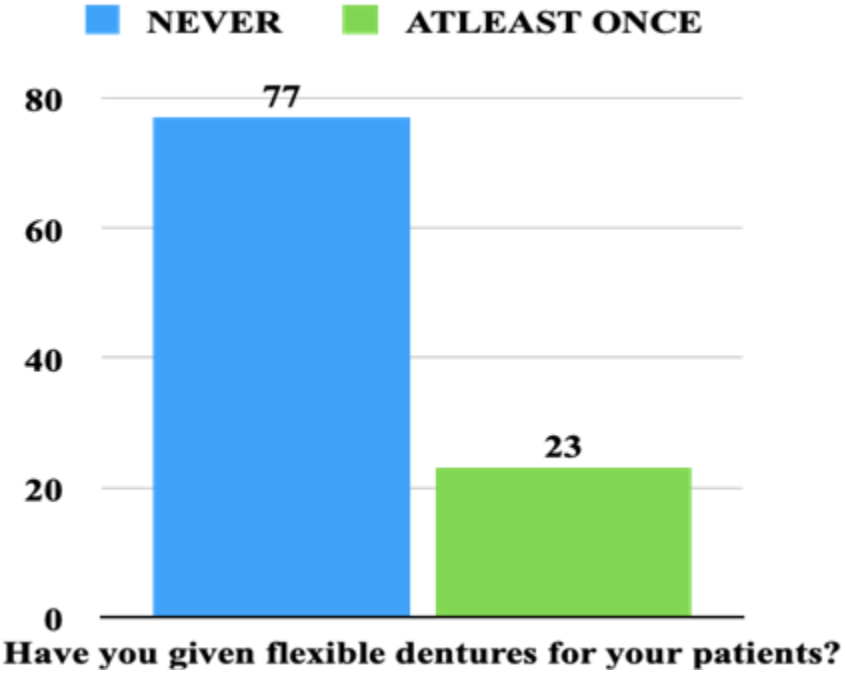
From this study, we can conclude that the majority of dentists are not aware about flexible dentures. This shows the need to conduct workshops and increase the content about flexible dentures in textbooks.

GRAPHS-

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15507 - 15515
Received 05 March 2021; Accepted 01 April 2021.



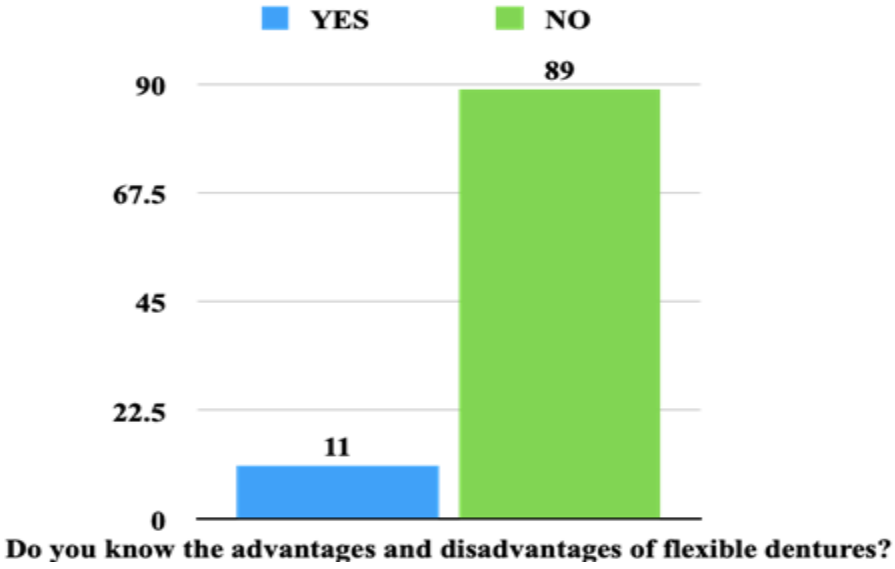
Graph1- Bar chart representing the number of dentists aware about flexible dentures. The X axis represents awareness of flexible dentures and Y-axis represents the number of dentists. It shows that 83% of the dentists were aware about flexible dentures and 17% were not aware about flexible dentures.



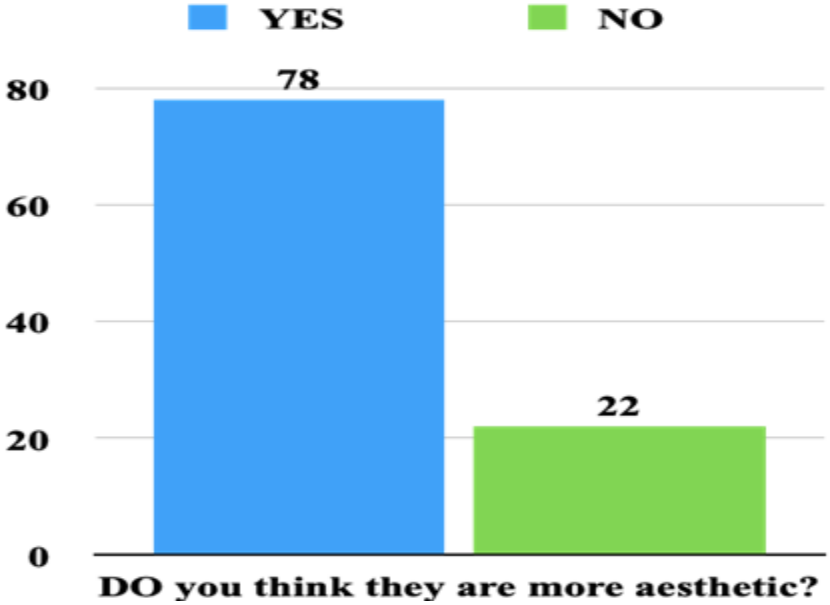
Graph 2- Bar chart representing the number of dentists practicing flexible dentures . X axis represents awareness of the practice of flexible dentures and the Y-axis represents the number of

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15507 - 15515
Received 05 March 2021; Accepted 01 April 2021.

dentists. It shows that 77% of the dentists have never given a flexible denture to their patients, 23% have given flexible dentures at least once to their patients.



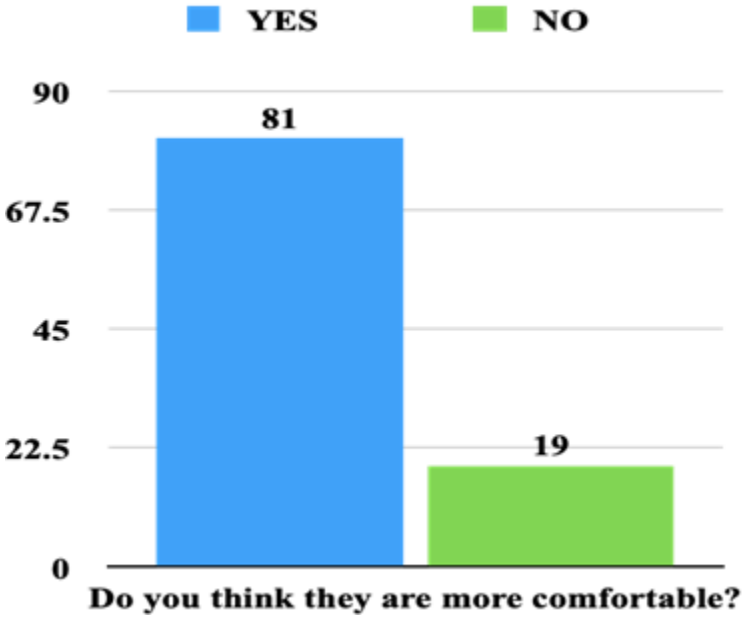
Graph 3- Bar chart representing the number of dentists aware of advantages and disadvantages of flexible dentures . The X axis represents awareness of the practice of flexible dentures and Y-axis represents the number of dentists. It shows that 11% of the dentists knew the advantages and disadvantages of flexible dentures and 89% did not know the advantages and disadvantages of flexible dentures.



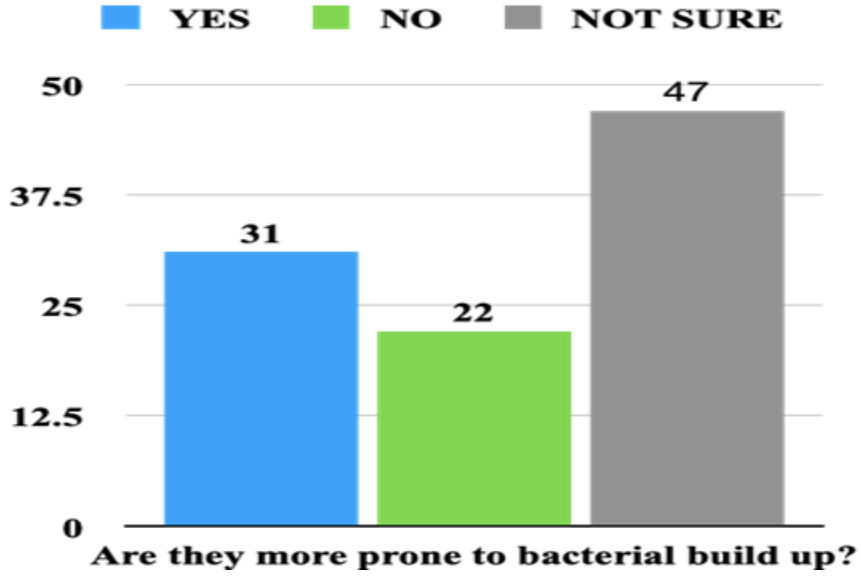
Graph 4- Bar chart representing the dentist's view on aesthetics of flexible dentures . The X axis represents the aesthetics of flexible dentures and the Y-axis represents the number of dentists. It

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15507 - 15515
Received 05 March 2021; Accepted 01 April 2021.

shows that 78% of the dentists think that flexible dentures are aesthetic than regular dentures and 22% of dentists say that it is not aesthetic.



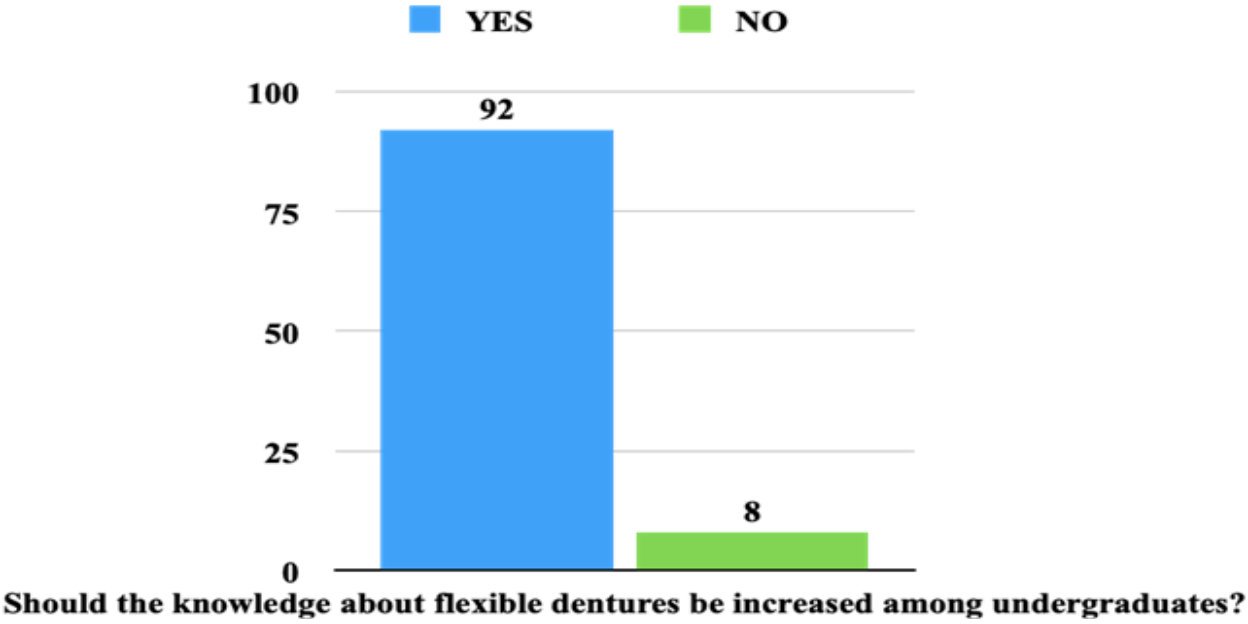
Graph 5- Bar chart representing the dentist's view on comfort of flexible dentures . The X axis represents the comfort of flexible dentures and the Y-axis represents the number of dentists. It shows that 81% of dentists think that flexible dentures are aesthetic than regular dentures and 19% of dentists say that it is not aesthetic.



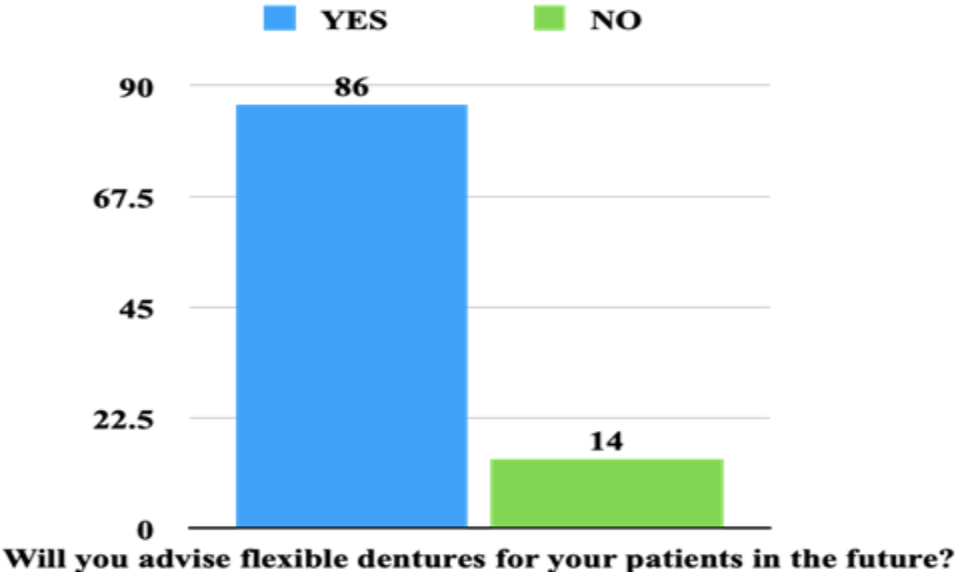
Graph 6- Bar chart representing the dentist's view on bacterial build up of flexible dentures . The X axis represents the opinion on bacterial build up of flexible dentures and the Y-axis represents the number of dentists. It shows that 31% of dentists think that flexible dentures are more prone

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15507 - 15515
Received 05 March 2021; Accepted 01 April 2021.

to bacterial build up, 22% think they are less prone and 47% of dentists say that they are not sure about the difference in bacterial build up.



Graph 7- Bar chart representing the number of dentists needing increase in knowledge of flexible dentures. The X axis represents the need for knowledge of flexible dentures and the Y-axis represents the number of dentists. It shows that 92% of dentists think that knowledge about flexible dentures should be increased and 8% of dentists think that there is enough knowledge among undergraduates.



Graph 8- Bar chart representing the number of dentists that prefer flexible dentures in the future. The X axis represents preference of flexible dentures and Y-axis represents the number of

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15507 - 15515
Received 05 March 2021; Accepted 01 April 2021.

dentists. It shows that 86% of the dentists would prefer flexible dentures in the future and 14% would stick to conventional dentures.

REFERENCES-

1.Anjum, A. S., Ganapathy, D. and Kumar, K. (2019) 'Knowledge of the awareness of dentists on the management of burn injuries on the face', *Drug Invention Today*, 11(9). Available at: https://www.researchgate.net/profile/Kiran_Pandurangan2/publication/337223550_Knowledge_of_the_awareness_of_dentists_on_the_management_of_burn_injuries_on_the_face/links/5dcbff5fa6fdcc5750470755/Knowledge-of-the-awareness-of-dentists-on-the-management-of-burn-injuries-on-the-face.pdf.

2.Ganapathy, D. M. *et al.* (2013) 'Evaluation of the influence of blood glucose level on oral candidal colonization in complete denture wearers with Type-II Diabetes Mellitus: An in vivo Study', *Dental research journal*, 10(1), pp. 87–92.

3.'Glossary of prosthodontic terms' (1987) *The Journal of Prosthetic Dentistry*, pp. 713–762. doi: 10.1016/0022-3913(87)90428-8.

4.Gupta, A. and Dhanraj, M. (2009) 'Implant surface modification: review of literature', *The Internet Journal of*. Available at: https://pdfs.semanticscholar.org/2621/efa71b775cbb82ac84373cfb09cd501045b6.pdf.

5.Hemalatha, R. and Dhanraj, S. (2016) 'Disinfection of Dental Impression- A Current Overview', *Cuddalore*, 8(7), pp. 661–664.

6.Inchara, R., Ganapathy, D. and Kumar, P. K. (2019) 'Preference of antibiotics in pediatric dentistry', *Drug Invent Today*, 11, pp. 1495–1498.

7.Indhulekha, V., Ganapathy, D. and Jain, A. R. (2018) 'Knowledge and awareness on biomedical waste management among students of four dental colleges in Chennai, India', *Drug Invention Today*, 10(12), pp. 32–41.

8.Jamayet, N. B. *et al.* (2013) 'Management of Kennedy Class I Partial Edentulism by Removable Cast Partial Denture: A Case Report', *Bangladesh Journal of Dental Research & Education*, p. 60. doi: 10.3329/bjdre.v3i2.16616.

9.Johnson, W. W. (1959) 'The history of prosthetic dentistry', *The Journal of Prosthetic Dentistry*, pp. 841–846. doi: 10.1016/0022-3913(59)90049-6.

10.Menon, A. and Ganapathy, D. M. (2019) 'Factors that influence the colour stability of composite resins', *Drug Invention*. Available at: http://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=09757619&AN=135479093&h=p0RtIVRRakA2WmTZKSO2mjg3a%2BDX%2FXUDjuHqOt369Jyhu1ivws6Lh%2FvaGeF8aiouB5onVQzLFOfI6yzLcQ4plw%3D%3D&crl=c.

11.Mohamed Usman, J. A. *et al.* (2013) 'Oromaxillary prosthetic rehabilitation of a maxillectomy patient using a magnet retained two-piece hollow bulb definitive obturator; a clinical report', *Case reports in dentistry*, 2013, p. 190180.

12.Moore, F. D. (1993) 'Book Review Surgery: An Illustrated History By Ira M. Rutkow. 550 pp., illustrated. St. Louis, Mosby-Year Book, 1993.$99. 0-8016-6078-5', *New England Journal of Medicine*, pp. 1899–1900. doi: 10.1056/nejm199312163292521.

13.Philip, J., Ganapathy, D. and Ariga, P. (2012) 'Comparative evaluation of tensile bond strength of a polyvinyl acetate-based resilient liner following various denture base surface pre-treatment methods and immersion in artificial salivary medium: An in vitro study', *Contemporary Clinical Dentistry*, p. 298. doi: 10.4103/0976-237x.103622.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15507 - 15515
Received 05 March 2021; Accepted 01 April 2021.

14. Phillips, R. W. and Skinner, E. W. (1991) *Skinner's Science of Dental Materials*. W B Saunders Company.
15. Phoenix, R. D. (1996) 'Denture base materials', *Dental clinics of North America*, 40(1), pp. 113–120.
16. Polyzois, G. *et al.* (2015) 'Flexible Removable Partial Denture Prosthesis: A Survey of Dentists' Attitudes and Knowledge in Greece and Croatia', *ActaStomatologicaCroatica*, pp. 316–324. doi: 10.15644/asc49/4/7.
17. Ramya, G., Pandurangan, K. and Ganapathy, D. (2019) 'Correlation between anterior crowding and bruxism-related parafunctional habits', *Drug Invention Today*, 12(10). Available at: https://www.researchgate.net/profile/Kiran_Pandurangan2/publication/337223674_Correlation_between_anterior_crowding_and_bruxism-related_parafunctional_habits/links/5dcc083a92851c81804bf0fd/Correlation-between-anterior-crowding-and-bruxism-related-parafunctional-habits.pdf.
18. Rueggeberg, F. A. (2002) 'From vulcanite to vinyl, a history of resins in restorative dentistry', *The Journal of prosthetic dentistry*, 87(4), pp. 364–379.
19. Sharma, D. A. *et al.* (2014) 'A Review: Flexible Removable Partial Dentures', *IOSR Journal of Dental and Medical Sciences*, pp. 58–62. doi: 10.9790/0853-131265862.
20. Singh, J. P. *et al.* (2011) 'Flexible denture base material: A viable alternative to conventional acrylic denture base material', *Contemporary Clinical Dentistry*, p. 313. doi: 10.4103/0976-237x.91795.
21. Soygun, K., Bolayir, G. and Boztug, A. (2013) 'Mechanical and thermal properties of polyamide versus reinforced PMMA denture base materials', *The Journal of Advanced Prosthodontics*, p. 153. doi: 10.4047/jap.2013.5.2.153.