

A Survey On Dental Implant Loading Among Undergraduate Dental Students

Research Article

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Abstract

Modern dentistry has witnessed a speedy and continued evolution. Regarding the implant-rehabilitation protocols, they have been redefined so as to satisfy patient's increasing expectations in terms of comfort, aesthetic and shorter treatment amount. The main objective of this study is to evaluate the knowledge and awareness on dental implant loading among undergraduates in a private dental college. The study was conducted in a private dental college, Chennai. The study group consisted of undergraduate dental students. Total number of studies included in the study was 200. There were 12 questions to assess their knowledge, and attitude towards dental implants loading. The data from their response were entered in the excel sheets. The collected data were coded, entered in microsoft excel 2013 and descriptive analysis carried out. Out of 200 participants, about 119% of them are aware about dental implants and its various systems involved and 116% are aware that implant loading is a prosthesis connected to dental implants after implant placement. Only 107% of them gave positive response regarding the three implant loading protocols and 93% gave negative response. Among the 3 loading protocols 106% of the students preferred conventional loading, 52% preferred early loading and only 42% preferred immediate loading. About 126% are unaware that immediate implant is done within 48 hours of implant placement. About 123% of students are aware that early loading is done between 1 week and 2 months and 140% of students are aware that the conventional loading is done after a healing period of 3-6 months. 117% of students are unaware that implant loading also influences the success rate of dental implants. From the study, it is observed that there is limited knowledge and awareness about implant loading protocols among the undergraduate dental students, though their knowledge and awareness about implants are appreciable. Continuing education programs and refreshing courses regarding dental implant loading are necessary to update the knowledge of dental students and practitioners. However, the knowledge acquired must be implemented in their daily practice and provide the better treatment required for the patients.

Keywords: Undergraduate Students; Dental Implants; Knowledge; Loading Protocols.

Introduction

Modern dentistry has witnessed, over the last decades, a rapid and continuing evolution of techniques in different fields. Concerning the implant-rehabilitation protocols, they have been redefined over the years, as a result of new knowledges in implant surgery and in order to satisfy patient's increasing expectations in terms of comfort, aesthetic and shorter treatment period. (Tettamantiet al.,

2017) Since Branemark introduced the osseointegration system in 1977 (Brånemark et al., 1977), new protocols have been proposed regarding the prosthetic-load timing, up to the immediate implant loading. Classic protocols propose that implants should receive no loading during the osseointegration period, usually 3 to 4 months in the mandible and 6 to 8 months in the maxilla (Brånemark, 1983) (Albrektsson et al., 1981) (Milillo et al., 2016)

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Received: March 26, 2021

Accepted: April 09, 2021

Published: April 14, 2021

Citation: Dhanraj Ganapathy, Sandhya. A Survey On Dental Implant Loading Among Undergraduate Dental Students. *Int J Dentistry Oral Sci.* 2021;08(04):2331-2336. doi: <http://dx.doi.org/10.19070/2377-8075-21000460>

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Implant Loading Protocols

Conventional Loading

Conventional loading is defined as the prosthetic restoration and functional loading of an osseointegrated implant after a healing period of three to six months. As mentioned, this protocol was originally defined for implants with machined surfaces. Often, but not always, implants following the conventional loading protocol are placed and then the surgical site closed requiring a second-stage surgery to "uncover" the implant. This is sometimes described as delayed loading.

Immediate Loading

At the other end of the spectrum is immediate implant loading. Immediate loading is defined as restoring the implant in occlusal contact within 48 hours of implant placement. Taken to its extreme, the immediately loaded implant could be placed and definitively restored, all within 48 hours. Immediate loading has shortened the transitional period between implant placement and implant restoration considerably. Benefits for the patient include reduced overall treatment time, reduced number of visits to clinicians, comfort during the healing period and improved esthetic and phonetic aspects.

Immediate Restoration

Immediate restoration or immediate provisionalization is similar to immediate loading. The implant is restored within 48 hours but in this case the restoration is left out of any functional occlusion. It is important to clarify that immediate loading and immediate restoration are independent of immediate implant placement. Although often described together and certainly related, implant placement protocols and implant loading protocols should be considered independently when treatment planning partially and fully edentulous patients.

Early Loading

Early loading falls temporally between conventional loading and immediate loading. Early loading is defined as the prosthetic loading or utilization of an implant at any time between immediate and conventional loading. Six to eight weeks of healing is common for early loading protocols, though advances in our understanding of the biologic processes underlying osseointegration and continuing advances in implant surface technology continue to decrease the amount of time required for adequate healing.

Updated protocols have shortened the healing period, so that implants could be loaded early and even immediately, before osseointegration is completely obtained (Tettamantiet al., 2017). A dental implant is an increasingly popular treatment option with a high success rate. With the advent of immediate single-stage implant placement, the edentulous patient can receive replacement in the same surgical visit, thereby reducing the time that has elapsed between implant placement and restoration with the prosthesis. (Tettamantiet al., 2017)(Wismeijer, Buser and Belser, 2019) However, these benefits come at the cost of associated risk factors including increased risk of infection, the need for bone augmentation procedure to solve disturbances between the im-

plant surface and alveolar bone, esthetic complications, and mucosal recession which occurs due to the paucity of the facial bone wall to support the facial soft tissues. (Attard and Zarb, 2005) (Esposito et al., 2010).

Awareness about dental implants is increasing among the general public and more and more patients are seeking information about dental implants (Kohliet al., 2015)(Jokstad, 2009). Hence, this study aims to evaluate the knowledge, and attitude of undergraduate students towards dental implant loading, so as to ascertain the need for awareness of the protocol among dentists and undergraduates to improve its use when indicated.

Materials and Method

A cross sectional questionnaire based study was carried out among dental students of a Private Dental College in Chennai who are practising in clinics. This study was conducted in an online setting. The sample comprised 200 participants. Simple random sampling methodology was employed. The questionnaire was framed with the help of experts in the field. The questionnaire kept the study group in mind and questions were linked to curriculum content of dental implants and loading protocols. A self-administered questionnaire consisting of 12 close ended questions. The dental students answered the questionnaire through an online survey platform. Filled questionnaires were collected and analyzed. The data from their response were entered in the excel sheets. The collected data were coded, entered in Microsoft Excel 2013 and descriptive analysis carried out.

Questionnaire

- Are you aware about dental implants and its various systems involved?
 - Yes
 - No
- Are you aware that implant loading is a prosthesis connected to dental implants after implant placement?
 - Yes
 - No
- Are you aware that primary stability is the fundamental requisite for a successful bone-implant interface during healing and loading?
 - Yes
 - No
- Are you aware that good bone quality and quantity influence to decide between the Implant loading protocols?
 - Yes
 - No
- Are you aware about conventional loading, early loading and immediate loading?
 - Yes
 - No
- Which one among the three loading protocols do you prefer?
 - Conventional loading
 - Immediate loading

c) Early loading

7. Are you aware about the additional surgical procedures such as bone augmentation, sinus lift, ridge expansion to increase the success rate of dental implants?

- a) Yes
- b) No

8. Are you aware that immediate implant loading is done within 48 hours of implant placement?

- a) Yes
- b) No

9. Are you aware that early loading is done between 1 week and 2 months?

- a) Yes
- b) No

10. Are you aware that the conventional loading is done after a healing period of three to six months?

- a) Yes
- b) No

11. Do you suggest implants as a treatment option to your patients as a replacement for missing teeth?

- a) Yes
- b) No

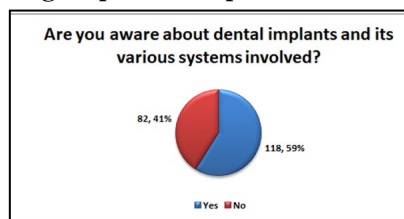
12. Are you aware that implant loadings also influence the success rate of dental implants?

- a) Yes
- b) No

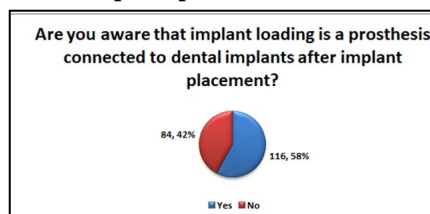
Results and Discussion

Out of 200 participants, about 119% of them are aware about dental implants and various systems involve [GRAPH 1] and 116% are aware that implant loading is a prosthesis connected to dental implants after implant placement [GRAPH 2]. About 130% of the students gave positive responses about primary stability being the fundamental requisite for a successful bone implant interface during healing and loading. [GRAPH 3] From the chart it is observed that 140% of them are aware about good bone quality and quantity influence to decide between the implant loading protocols. [GRAPH 4] Out of 200 students, only 107% of them gave positive response regarding the three implant loading protocols and 93% gave negative response. [GRAPH 5] Among the 3 loading protocols 106% of the students preferred conventional loading, 52% preferred early loading and only 42% preferred immediate loading. [GRAPH 6] From the chart it is observed that 150% are aware about the additional surgical procedures such as bone augmentation, sinus lift, ridge expansion to increase the success rate of dental implant [GRAPH 7]. About 126% are unaware that immediate implant is done within 48 hours of implant placement [GRAPH 8]. About 123% of students are aware that early loading is done between 1 week and 2 months. [GRAPH 9] 140% of students are aware that the conventional loading is done after a healing period of 3-6 months [GRAPH 10]. About 104% of students gave a positive response that they suggested implant as a treatment option to their patients. [GRAPH 11] 117% of students

Graph 1. The pie chart showing distribution of study population who were asked about dental implants and its various systems involved. About 118% gave positive responses and 82% gave negative responses.



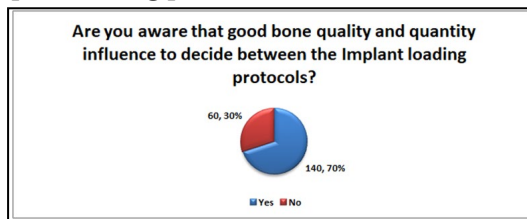
Graph 2. The pie chart showing distribution of study population who were asked that implant loading is a prosthesis connected to dental implants after implant placement. About 116% gave positive responses.



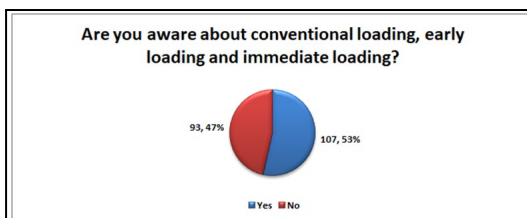
Graph 3. The pie chart showing distribution of study population who were asked about primary stability being the fundamental requisite for a successful bone implant interface during healing and loading. About 130% of students gave positive responses.



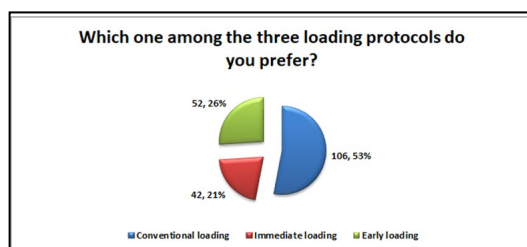
Graph 4. The pie chart showing distribution of study population who were asked for good bone quality and quantity influence to decide between the implant loading protocols. About 140% of the students gave positive responses.



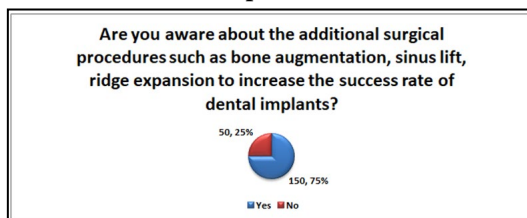
Graph 5. The pie chart showing distribution of study population who were asked about conventional loading, early loading and immediate loading. About 107% of the students gave positive responses and 93% gave negative responses.



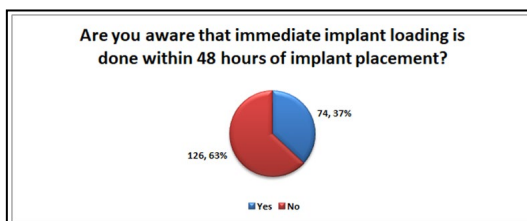
Graph 6. The pie chart showing distribution of study population who were asked about the three loading protocols. About 106% preferred conventional loading, 52% preferred early loading and only about 42% preferred immediate loading.



Graph 7. The pie chart showing distribution of study population who were aware about additional surgical procedures such as bone augmentation, sinus lift, ridge expansion to increase the success rate of dental implant. About 118% gave positive responses.



Graph 8. The pie chart showing distribution of study population who were aware that immediate implant loading is done within 48 hours of implant placement. About 126% gave negative responses.

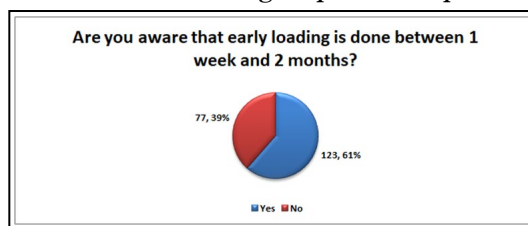


are unaware that implant loading also influences the success rate of dental implants. [GRAPH 12]

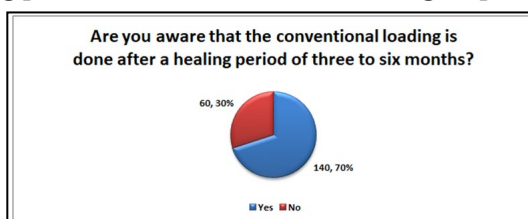
Literature shows that the main advantage of dental implants as compared to other tooth-replacement modalities is they are more conservative as there is no need of preparing natural teeth as in conventional partial dentures (Misch, 2001)(Chaudhary et al., 2015)(Jivraj and Chee, 2006). Prosthodontic rehabilitation of missing teeth has greatly evolved especially with the introduction

of dental implants. Appropriate knowledge of diagnostic and therapeutic options within the scope of dental implant therapy is therefore, mandatory even for general dental practitioners (Narby, Bagewitz and Soderfeldt, 2011)(Tettamantiet al., 2017). Immediate implant loading can shorten treatment time, provide immediate restoration of function and esthetics, and mitigate the psychological impact. This study showed that the knowledge of our participants about immediate dental implant therapy is relatively low, as evidenced by the percentage of participants with good

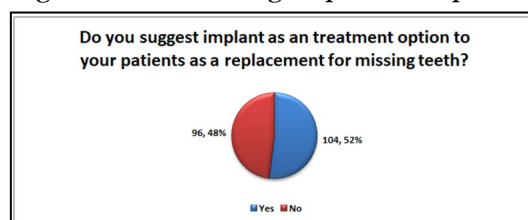
Graph 9. The pie chart showing distribution of study population who were that early loading is done between 1 week and 2 months. About 123% gave positive responses.



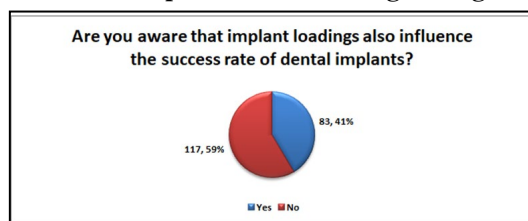
Graph 10. The pie chart showing distribution of study population who were asked that the conventional loading is done after a healing period of 3-6 months . About 140% gave positive responses.



Graph 11. The pie chart showing distribution of study population who were asked about implants as a treatment option to patients as a replacement for missing teeth. About 104% gave positive responses and 96% gave negative responses.



Graph 12. The pie chart showing distribution of study population who were asked that implant loading also influences the success rate of dental implants. About 117% gave negative responses.



knowledge in our study (126%).

Accordingly to Aparicio et al.,(Aparicio, Rangert and Sennerby, 2003) Immediate implant loading has been denied as a restoration placed in the occlusion with the opposing dentition within 72 h of implant placement. From our study, About 126% are unaware that immediate implant is done within 48 hours of implant placement. In this study, the observed level of practitioners with good knowledge is lower than what was reported by Lang-Hua et al. (Lang-Hua et al., 2013) in a study. Furthermore, this may mean that more recent advancement in treatment procedures (such as the immediate implant protocol) is typically not taught at the undergraduate level, with interested dentists who aspire to obtain this knowledge having to seek it in developed parts of the world where it is being carried out on a more routine basis.

A study conducted by Shrestha et al stated that, Majority of the general dental practitioners in this study (83.1%) had negative attitudes toward the one-stage implant protocol. This observation is in contrast with the reports of Nagpalet al.8, where 91.3% of the respondents had either positive attitudes or no reservations

toward dental implant therapy. The reason for the very high level of reservations in our region may be attributed to the low level of good knowledge available at the disposal of these dentists concerning this type of implant protocol as this study found a significant association between the knowledge of the general dental practitioners and their attitude toward the one-stage protocol, with more individuals with fair or poor knowledge having negative attitudes.

Implant training is said to be an additional factor that improves the knowledge, attitude, and practice of practitioners regarding dental implant therapy (Website, no date) and as such, significant advancements are expected if more practitioners are trained on the immediate loading protocol. The study suggests that there is a need to raise awareness regarding implant loading protocols among dental practitioners (Block et al., 2009).

Conclusion

From the study, it is observed that there is limited knowledge and awareness about loading protocols and criteria for immediate

and delayed implants among the undergraduate dental students, though their knowledge and awareness about implants are appreciable. This facilitates the need for strengthening education in dental students to reinforce their knowledge and awareness about loading protocols of various types of implants in their curriculum implants. Moreover, dental student's awareness regarding loading protocols and clinical criteria helps in eradicating any negative reflection of this procedure that may have been caused due to lack adequate information. Continuing education programs and refreshing courses regarding dental implant loading are necessary to update the knowledge of dental students and practitioners. However, the knowledge acquired must be implemented in their daily practice and provide the better treatment required for the patients.

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