

How to Cite:

Pacharne, A. P., Nazirkar, G. S., Damale, V. H., Kumar, B. S. P., & Sadafule, N. (2022). Comprehensive assessment of dentists knowledge and awareness about surgical template used in implant surgeries: An original research study. *International Journal of Health Sciences*, 6(S2), 7670–7676. <https://doi.org/10.53730/ijhs.v6nS2.6892>

Comprehensive assessment of dentists knowledge and awareness about surgical template used in implant surgeries: An original research study

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Abstract---Aim: Accurate treatment planning for implant which considers anatomical factors and prosthetic needs is essential to guarantee a predictable therapy. The aim of this study was to assess the current knowledge and awareness about surgical template among general dental practitioner in Kanpur, India. Materials & Methods: This study was entirely attempted on a cross-sectional idea. It also used the rational usage of questionnaire. However, after considering some essential aspects, this number was lastly reduced to 100. Authors completed the study by close-ended questionnaire containing questions about the present knowledge and awareness about surgical template. Response was recorded and data was processed statistically to evaluate the real-time knowledge and awareness level. Results: Statistical analysis was done using statistical software 'Statistical

Package for the Social Sciences (SPSS)'. The recorded data was subjected to suitable statistical tests to obtain p values, mean, standard deviation, standard error and 95% CI. $P \leq 0.05$ was considered as statistically significant. 27 practitioners were unaware of the usage of surgical template. 94 practitioners think that UG dental curriculum is inadequate regarding surgical template. 60 practitioners think that surgical template must be made mandatory for all dental institutions. Only 12 practitioners have attended any CDE/CME/Workshop/Demo/Hands-On on surgical template. Conclusion: Within the limitations of the study authors concluded that dentists Knowledge and awareness about implant surgical template was at moderate levels.

Keywords---implant, surgical template, awareness, knowledge.

Introduction

In this third millennium, dental implants are attractive and more common therapeutic alternative nowadays. This apparently stands true because a large number of patients are choosing for this treatment modality. For an accurate prognosis of implant treatment, correct implant placement is the sole criteria. So, precise treatment planning for dental implant that considers anatomical structure and prosthetic requirements is compulsory to guarantee a predictable treatment.¹ Also, it diminishes the overall possibilities of anticipated probable post-operative complications. Ideal dental implant placement facilitates the right institution of favorable forces on the implants and prosthetic components with acceptable esthetic outcomes. However, in order to boost the treatment success, it is necessary that the implants are being surgically placed in the right way. To ascertain a rational link between diagnosis, prosthetic planning and surgical phases, use of direction transfer tool is indispensable.² Therefore; the surgical template is constructed by the operating personal. The surgical template, if at all possible, is able to carry radiographic markers. This is done so that it could offer contrast between the surgical template and sites selected for implant trajectory to be used in diagnostic imaging. Meanwhile, the American Academy of Oral and Maxillofacial Radiology has recommended the use of surgical templates with radiographic markers in conjunction with imaging.³ Glossary of prosthodontic terms, define surgical template as a guide used to assist in proper surgical placement and angulations of dental implants. Prosthetically driven implant prosthesis assures good aesthetics, function and more importantly hygiene maintenance enabling long time success. Additionally, the main objective of the surgical template is to direct the implant drilling system and provide accurate placement of the implant according to the surgical treatment plan. Therefore, surgical templates have enabled clinician to deliver predictable surgical & prosthetic rehabilitation.⁴ Surgical guides have not only decreased the chances of iatrogenic damage of critical anatomic structures; they also increase the esthetic and functional advantages of prosthodontic-driven implant.⁵ The aim of this study was to evaluate the current knowledge and awareness about surgical template among general dental practitioner in Kanpur, India.

Materials and Methods

The present study was conducted to evaluate the present knowledge and awareness about surgical template among general dental practitioner in Kanpur, India. It was outlined to finish this study on a cross-sectional and questionnaire model. We studied total 100 private dental practitioners of Kanpur city, India. The contact details of the general dental practitioners were obtained from the registry of Kanpur Society/Association of Dental Practitioners. Initially we found that there were total 255 registered in this society. Out of which, 86 were not actively practicing, rest remaining was 169. On further examination we found that 69 of them not responded to our questionnaire efficiently because of various reasons. Therefore final sample included in the study was total 100 the general dental practitioners of Kanpur city, India. We have analyzed questionnaire response data of 100 clinicians professionally. We had also pre-formulated the questions of surgical template knowledge and awareness in a questionnaire format. The delivery of the questions and their resultant responses was done in the form of an exclusive close-ended questionnaire containing 8 items. Authors had handed over this questionnaire to the studied clinicians at their work places. Informed consent was taken from the respondents those were willingly ready for participation. The significance of this study was explained in detail to all general dental practitioners. Results thus obtained was tabulated and subjected to basic statistical analysis. P value less than 0.05 was considered significant ($p < 0.05$).

Statistical Analysis and Results

Responses which observed from questionnaire work out were sent for statistical analysis using statistical software Statistical Package for the Social Sciences version 21 (IBM Inc., Armonk, New York, USA). The resulting data was subjected to suitable statistical tests to obtain p values, mean, standard deviation, chi-square test, standard error and 95% CI. Table 1 and Graph 1 showed that out of 100 practitioners, males were 65 and females were 35. Total 11 practitioners were belonging to age group >65 years. 19 practitioners were belonging to the age range of 41-50 years. 23 practitioners were belonging to the age range of 31-40 years and 61-65 years. P value was significant in group III of age range 51-60 years. Evaluations of knowledge by assessment of the professional degrees were also attempted (Table 2). More than 75% practitioners were having only undergraduate degree whereas 22 practitioners were having undergraduate as well as post graduate degrees. Questionnaire responses revealed significant outcomes wherein p value was also found to be significant (Table 3). 27 practitioners were unaware of the usage of surgical template. 94 practitioners think that UG dental curriculum is inadequate regarding surgical template. 60 practitioners think that surgical template must be made mandatory for all dental institutions. Only 12 practitioners have attended any CDE/CME/Workshop/Demo/Hands-On on surgical template. Only 16 practitioners have attempted implant osteotomy with surgical template at their clinic. Table 4 shows basic statistical description with level of significance evaluation using Pearson Chi-Square Test for all 9 screened questions. Question no 3 and 5 showed significant levels ($p < 0.05$ significant).

Table 1: Age & Gender Wise Distribution of Practitioners

Age Group (Yrs)	Male	Female	Total %	P value
31-40	16	7	23 [23 %]	0.06
41-50	12	7	19 [19 %]	0.80
51-60	20	4	24 [24 %]	0.01*
61-65	17	6	23 [23 %]	0.10
>65	10	1	11 [11 %]	0.08
Total	75	25	100%	*Significant *p<0.05

Table 2: Assessment of Practitioners by Educational Degree

Educational Degree	Number	Mean	Standard Deviation
Dental Graduate	76	16.76	16.84
Dental Graduate (PG)	22	6.97	13.86
Dental Graduate (PG) + PhD/Add. Researches	2	2.77	3.34
Total	100	-	-

Table 3: Questionnaire Estimation And Evaluation With Related Statistical Correlations

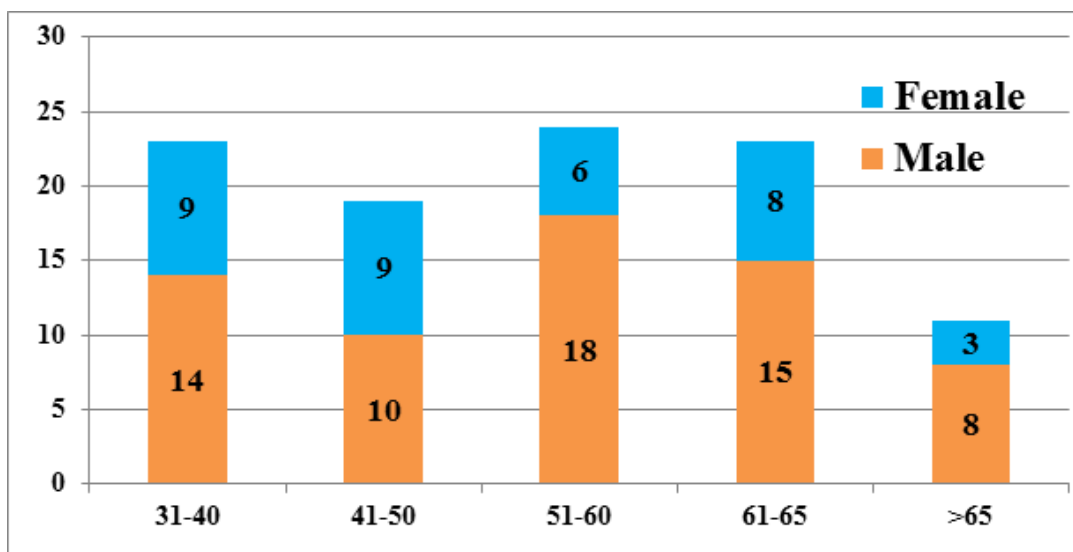
Questionnaire	Variables	Responses of Practitioners [Yes]	Responses of Practitioners [No]	p Value
1	Do you know about surgical template?	73	27	0.010*
2	Do you think it is must be mandatorily used in Oral Implantological procedures	65	35	
3	Do you think that surgical template is an excellent tool for initiating osteotomy procedure ?	49	51	
4	Do you think that UG dental curriculum is inadequate regarding implant surgical template ?	94	6	
5	Have you ever attended any CDE/ Workshop/Demo/Hands-On on implant surgical template ?	12	88	
6	Do you think it's usage must be made mandatory for all dental institutions ?	60	40	
7	Do you think that surgical template could be proved as an ultimate tool in future	45	55	

	dentistry and research ?			
8	Have you ever attempted implant osteotomy with surgical template at your clinic ?	16	84	
9	After completion of this questionnaire/study; Are you willing to receive regular updates/news about surgical template ?	80	20	
*p<0.05 significant				

Table 4: Basic Statistical Description With Level Of Significance Evaluation Using Pearson Chi-Square Test

Question No.	Mean	Std. Deviation	Std. Error	95% CI	Pearson Chi-Square Value	df	Level of Significance (p value)
1	3.43	0.362	0.360	2.36	2.675	1.0	0.456
2	2.87	1.287	0.050	1.96	2.287	1.0	0.060
3	2.38	1.345	0.568	1.96	2.434	1.0	0.010*
4	2.56	0.675	0.085	2.45	1.598	2.0	0.760
5	3.67	1.343	0.035	1.96	2.521	2.0	0.000*
6	2.34	0.392	0.089	1.65	2.234	1.0	0.675
7	2.39	1.455	0.036	1.76	1.265	2.0	0.567
8	2.65	0.329	0.083	2.65	2.287	1.0	0.387
9	2.47	0.676	0.034	2.45	1.568	2.0	0.780
*p<0.05 significant							

Graph 1: Age & Gender Wise Distribution Of Practitioners



Discussion

Glossary of prosthodontic terms defines surgical template as a guide used to assist in proper surgical placement and angulation of dental implants. Surgical guide is the connecting link between what's in mind (treatment planned) and what will be executed (treatment).⁶ Prior determination of the suitable osteotomy site for the clinician greatly helps the surgical procedure. If the clinician is considered a pilot, then surgical guide is his navigator.⁷ Ideal positioning of the implant facilitates the redirection of favorable forces on the implants and the prosthetic component as well as ensures an aesthetic outcome.⁸ Hence, it is worthwhile to set up a logical continuity between the planned restoration and the surgical phases. It is also indispensable to use a transfer device that for sure increases the predictability of success. Implant surgical template has many other uses like 1) it provide a precise guidance of osteotomy drills at correct position, angulation and depth 2) guidance of implant fixtures at correct position, angulation and depth 3) guidance of amount of bone reduction or bone harvesting whenever necessary.⁹ Its disadvantages includes 1) template once fabricated, they usually not allow any manufacture alterations from pre decided position if it is needed during surgery 2) guide dislocation may be seen in between surgery if the guide is not stabilized.¹⁰ Adrian *et al.* used self cure acrylic resin to construct radiographic cum surgical template. He molded lead foil over the maxillary and mandibular incisors and used lateral cephalogram to cross verify related parameters.¹¹ Tarlow employed the use of acrylic resin duplicate denture wherein he adapted vacuum formed thermoplastic matrix (0.02 inch) over duplicate denture. Such designing dictates accurate implant location and angulations, with minimal interference to surgical access.¹² Espinosa Marino *et al.* showed the first clinical use of heat polymerizing acrylic resin in fabrication of the surgical template particularly for partially missing situations. To make it radio-opaque on CT, they applied dual curing composite resin mixed with colored chalk.¹³ Stellino *et al.* showed acrylic resin provisional fixed restorations with the use of gutta parcha as radio-opaque marker.¹⁴

Conclusion

Within the limitations of the study authors concluded that studied dentist's knowledge and awareness about implant surgical template was at moderate levels. Because the surgical template is an imperative and effective tool in the field of oral implantology, frequent educational programs and technique demonstrations must be organized to update the existing knowledge of clinicians. The outcomes of this study must be considered as suggestive for anticipating clinical results of such critical situations.

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Funding

No external funds were allocated for this study.

Statement of conflict of interest

In the opinion of the author, there was no conflict of interests.