

Cross Sectional Evaluation of Knowledge and Awareness about Imperative Role of Dental Operating Microscope in Endodontics: A Questionnaire Based Original Study

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ABSTRACT

Background: With the ever-increasing advancements in dental technologies, the intricate usage of dental operating microscope in endodontics is no more uncommon. Still the relative numbers of such practices are well below the expected levels. This is true for rural as well as urban setups. This study was conducted to evaluate the knowledge and awareness of the role dental operating microscope (in different endodontic procedures) among general dental practitioners of Ghaziabad District.

Materials & Methods: This study was exclusively based on a cross sectional theme which was based on a questionnaire comprised of 100 general dental practitioners of Ghaziabad District, India. The participants were divided into four age groups. We employed a self prepared questionnaire having questions regarding knowledge and awareness about dental operating microscope. The questionnaire was distributed among general dental practitioners. We processed the response data of dentists who truthfully responded to this questionnaire. Response was recorded and data was processed statistically to evaluate the real awareness level.

Results: Statistical analysis was completed using statistical software Statistical Package for the Social Sciences (SPSS). The obtained data was subjected to appropriate statistical tests to obtain p values and other statistical inferences. $P \leq 0.05$ was considered as statistically significant. The participants were divided into four age groups. Total 61 male and 39 female dentists were studied. 55 dentists think that usage of dental operating microscope must be made mandatory for routine endodontic procedures. The p value was found to be significant in group I. Roughly 51 percent dentists would like to advice their colleagues for installation of dental operating microscope at their clinics.

Conclusion: Within the limitations of the study authors concluded that overall level of knowledge and awareness about dental operating microscope (in different endodontic procedures) among general dental practitioners of Ghaziabad district was moderate only. As dental operating microscope is an emerging boom in the field of endodontics, regular conductions of educational programs and technique demonstrations must be done to increase the overall awareness levels of dental operating microscope.

Keywords: Awareness, Dental Operating Microscope, Knowledge.

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INTRODUCTION

As we all know that the traditional clinical practice is largely depends on high magnification and it has been well known for more than 60 years. The relative importance of high magnification in dentistry has also been well known for more than 25 years in field of endodontics.¹ Literature has well evidenced about advantages of the dental operating microscope in terms of enhanced ergonomics and improved clinical efficacies and outcomes.² Literature has also shown about the imperative role of dental operating microscope in diagnostic procedures, record keeping procedures and in patient education and motivation.³ The dental operating microscope has gained its immense popularity last 15 years. Additionally, the dental operating microscopy education was being made compulsory by the Commission on Dental Accreditation of the American Dental Association.⁴ As on now; the usage of dental operating microscope has been increasing day by day among dentists and particularly among endodontists. As we all are aware that conventional endodontics has been routinely practiced mainly based on tactile sense not sight.⁵ However, with the profound usages of dental radiography and electronic apex locators this blind approach has produced enhanced success rates. It is therefore, magnified vision not only helps the clinician to explore deep inside, but to see well. Different pioneer workers have shown different inferences regarding dental operating microscopy.⁶ Most of the related studied have shown these five basic advantages in using the dental operating microscopy. 1) Improved visualization, superior Quality and accuracy of treatment, better ergonomics, effortlessness of digital record keeping and amplified communication and transfer ability via incorporated videos. Many of the researchers have shown that the human eye has the intrinsic capability to resolve or differentiate two separate lines or entities that are at least 200 microns apart. If the lines are closer together, two separate entities or the objects will appear as one. Most people cannot refocus at distances closer than 10 to 12 cm. As the eye-subject distance decreases, the eyes must converge, creating eyestrain. Additionally, with aging, the capability to focus at closer distances is severely compromised. This study was conducted to evaluate the knowledge and awareness of the role dental operating microscope (in different

endodontic procedures) among general dental practitioners of Ghaziabad District. Here authors have genuinely attempted to explore the actual level of awareness among the dental practitioners regarding dental operating microscope usages in endodontic procedures.

MATERIALS & METHODS

This cross sectional, questionnaire based study included of 100 private dental practitioners of Ghaziabad district, India. The study was conducted in the year 2018. The contact details of private dental practitioners were achieved from the society/association registry of Ghaziabad society of dental practitioners. We found that a total of 270 registered in this society. Out of which, 60 were not actively practicing, rest remaining was 210. On examining the responses of the participants, we noticed that 10 of 210 not responded to our questionnaire. Therefore final sample including in the study was total 200 private dental practitioners of Ghaziabad district. To omit any type of discrepancy in selection procedure, one in every two was selected via systemic random sampling procedures. So, we had to use data of 100 respondents effectively. A self prepared and close ended questionnaire containing 10 items were delivered to the dentists at their clinics. The privacy and other confidential rights of the respondents and their freedom of expression were completely ensured. Informed consent was taken from the practitioners those were willingly ready for participation in study. To ensure absolutely stress-free responses, the study was completed over a period of 2 months. In this tenure, practitioners were asked to complete the questionnaire. The actual significance of this study was explained to all practitioners. The results were subjected to statistical analysis using chi-square test. P value less than 0.05 was considered as significant.

RESULTS

All the observational notations were compiled and sent for statistical evaluation using statistical software Statistical Package for the Social Sciences version 21 (IBM Inc., Armonk, New York, USA). The obtained data was subjected to suitable statistical tests to calculate p values and other statistical inferences. Responses and outcomes of knowledge and awareness were also evaluated in relation to

gender of the participants. The participants were divided into four age groups. Total 61 male and 39 female dentists studied. Table 1 and graph 1 illustrate that age groups 25-35 years had 29 males and 9 females ($P < 0.05$), 36-45 years had 16 males and 10 females, 46-55 years had 9 males and 13 females and >55 years had 7 males and 7 females. The p value was found to be significant in group I. Table 2 shows that 55 dentists think that usage of dental operating microscope must be made mandatory for routine endodontic procedures. 78 dentists believe that it is easy of locate the second mesiobuccal canal in maxillary molars using dental operating microscope. 98 dentists believe that dental operating microscope help in early detection and diagnosis of dental caries. 68 dentists think that

they can't charge enough to make it worthwhile. 95 dentists think that it costs too much. Approximately 51 percent dentists would like to advice their colleagues for installation of dental operating microscope at their clinics. Significance differences [$*p < 0.05$ significant] were noticed when they were enquired about question no 5, 6, 7. The observed p values were 0.01, 0.00 and 0.01 for these parameters respectively. Table 3 and graph 2 shows the responses and outcomes of knowledge and awareness as related to gender of the participants. For all the statistical inferences, the p value was insignificant. Mean values were also tabulated wherein 17.32 was minimum value and 19.77 was the maximum value.

Table 1: Age & gender wise distribution of dentists.

Age Group (Yrs)	Male	Female	Total	P value
25-35	29	9	38 [38 %]	0.01*
36-45	16	10	26 [26 %]	0.50
46-55	9	13	22 [22 %]	0.10
>55	7	7	14 [14 %]	0.80
Total	61	39	100	-

*** $p < 0.05$ significant**

Table 2: Assessment of questionnaire responses with related statistical correlations.

Questionnaire	Variables	No. of Respondents	Chi Square Test (Pearson χ^2)	P value
1	Do you actually use dental operating microscope to perform different endodontic procedures?	Yes = 15 No = 85	0.07	0.34
2	Do you know how to clean the lenses of dental operating microscope?	Yes = 15 No = 85	0.82	0.09
3	Do you think that usage of dental operating microscope must be made mandatory for routine endodontic procedures ?	Yes = 55 No = 45	0.03	0.66
4	Do you believe that it is easy of locate the second mesiobuccal canal in maxillary molars using dental operating microscope ?	Yes = 78 No = 22	0.75	0.22
5	Do you think that all endo related procedure must be recorded using a video recorder provided in the dental operating microscope ?	Yes = 88 No = 12	0.54	0.01*
6	Do you believe that dental operating microscope help in early detection and	Yes = 98 No = 2	0.21	0.00*

	diagnosis of dental caries?			
7	Do you really think that it costs too much?	Yes = 95 No = 5	0.50	0.01*
8	Would you like to advice your colleagues for installation of dental operating microscope at their clinics?	Yes = 51 No = 49	0.44	0.70
9	Do you think that you can't charge enough to make it worthwhile?	Yes = 68 No = 32	0.88	0.22
10	Do you think that it will make my eyes tired?	Yes = 78 No = 22	0.01	0.92

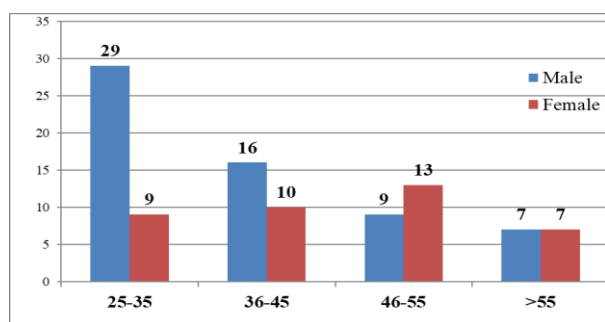
* $p < 0.05$ Significant

Table 3: Assessment of knowledge and awareness as related to gender.

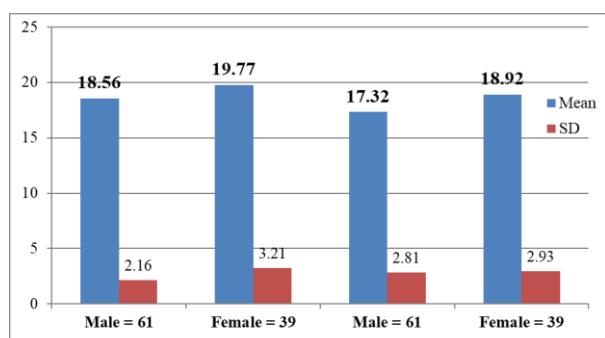
S. No.	Parameters	Gender	Mean	SD	P value
1	Knowledge Assessments	Male = 61	18.56	2.16	0.02#
		Female = 39	19.77	3.21	0.04#
2	Awareness Assessments	Male = 61	17.32	2.81	0.07#
		Female = 39	18.92	2.93	0.06#

$p > 0.05$ Non-Significant

Graph 1: Graphical representation of dentists [age & gender wise].



Graph 2: Graphical representation of evaluation of knowledge [1st & 2nd set of columns] and awareness [3rd & 4th set of columns] as related to gender of dentists.



DISCUSSION

Literature has not sufficiently evidenced about the dental operating microscope and its related significances in the field of endodontics. It was Baumann in 1975 who actually reported the successful use of Microscopes in endodontics.⁷ Among all the specialized dental practitioners, endodontist had a more percentage of clinical exposure of working under microscopes. Literature have shown various studies wherein dental operating microscope has been shown to be very effective in detecting the root canal orifice than the dental loupes.⁸ Dental operating microscope has also been shown to enhance the clinical outcomes in managing the calcified canals. Some of the researchers have also shown its effectiveness in precisely locating two mesiobuccal canals of maxillary molars and nonclinical situations. Most of the concerned pioneer workers believe that dental operating microscopic method of identifying orifices is more efficient than identifying by surgical loupes.⁹ Shanelec and Tibbets showed that practitioners those who are functioning without magnification, can make movements that were 1–2 mm at a time.¹⁰ However, At 20X magnification, the refinement in movements can be as little as 10–20

microns at a time. It is imperative here to note that the inadequacy to precision of treatment is not in the hands but in the eyes. Baldissara et al stated that the skilled practitioners with a sharp, new explorer can determine marginal gaps of around 36 microns with a tactile sense.¹¹ Consequently, it can be thought of that whenever magnification is more than 6X, the dependence on an explorer and tactile means of inspection considerably lower down.¹²⁻¹³ Dental operating microscope allows enhanced visualization which enables the clinician to diagnose problems in the earlier stages of a disease process.¹⁴ Higher magnification also allows endodontists to better identify anatomical landmarks, within the pulp chamber including the sides, management of iatrogenic problem such as pulpal floor perforation, lateral root perforation etc. With the enhanced vision from dental operating microscope, an endodontist can easily examine the most coronal aspects of fractured post and broken instruments and to remove them without any major loss of tooth structure.¹⁵⁻¹⁶

CONCLUSION

The studied responses were very imperative as they reflected the present scenario of knowledge and awareness of usage of dental operating microscope in different endodontic procedures. Within the limitations of the study authors concluded that overall level of knowledge and awareness about dental operating microscope among general dental practitioners of Ghaziabad district was moderate only. Most of the practitioners believe that dental operating microscope is very useful in early detection and diagnosis of dental caries. As dental operating microscope is a promising clinical innovation in the field of endodontics, regular conductions of educational programs and technique demonstrations must be done to increase the overall awareness levels of dental operating microscope. Furthermore, our study outcomes could be treated as suggestive for predicting clinical awareness for such situations. However we expect other large scale genuine studies to be conducted that could further establish certain concrete guidelines in this field.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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