



## Research Article

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# Assessment of attitude and perception of implementation of four handed dentistry among dental students - A Cross sectional study

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## Abstract

**Aim and objective:** The aim of the study is to determine the attitude and perception of implementation of four handed dentistry at institutional level among dental students of Maharashtra. **Methodology:** A total of 250 participants from the Maharashtra (India) region completed a questionnaire-based survey on implementation of four handed dentistry among dental students at institutional level. Questionnaire was distributed online using google forms. A non random sampling method was used for the collection of data and the distribution of responses was presented as percentages. Data was tabulated in excel and descriptive statistics were made. **Results:** A total of 250 participated in the survey, among the respondents majority (90%) thought that its implementation will be beneficial and will help increase productivity and quality of dental treatment. More than 93% think that its implementation will reduce operators fatigue and enhance physical well-being. 46.2% preferred their batchmates assistance. **Conclusion:** There is specific and strong need to increase the knowledge and awareness regarding four handed dentistry among dental students at institutional level. Stake holders needs to focus on implementing four handed dentistry as a tool to train dental students.

**Keywords:** Chair-Side Assistant, Dental Assistant, Ergonomics, Four Handed Dentistry.

## INTRODUCTION

The term "Four handed dentistry" was first recorded during a conference on "training dental students to use chair side assistants" in 1960<sup>[1]</sup>. Glene Robinson in 1968 summarised the concept of four handed dentistry. Four-handed dentistry is a team concept where highly skilled individuals work together in an ergonomically designed environment to improve the productivity of the working dental team, improves the quality of care for the dental patients while protecting the physical well-being of the operating team members as well as patients.<sup>2</sup> Four handed dentistry involves an observant study of all the steps of clinical management to save time and minimise stress associated with the practice of any form of conventional dentistry. It can categorically contribute to the efficiency of the clinical practice.

Four-handed dentistry enables more comfortable dentistry for the practitioner and the assistant. It maximises teamwork and can minimize the stress and increases job satisfaction. The patient is benefited by increased patient comfort, decreased treatment time, decreased appointments and improved quality of work. An increase in productivity, which ranges from (33%-75%), has been demonstrated in clinical practice<sup>[3]</sup>.

Four handed dentistry is conveniently the most favourable method in terms of time and efficiency. It minimizes undesirable verbal and body movements, thus protecting physical well-being of the operating team<sup>[4]</sup>. During clinical training four handed dentistry is not practiced at institutional level. During Clinical Postings Dental Students are been taught and trained about the dental diseases and its management. Students while learning the skills of dentistry have to learn on their own under the faculty Supervision with respect to Management, treatment procedure, organizing instruments, materials and manipulation of dental materials etc single. However, one student while learning any dental procedure has its own limitation and results in increase treatment time as well as increases the fatigue of the operator. Perhaps Implementation of four handed dentistry among students at improve the learning process, physical and emotional health and decrease the treatment time. Although benefits of four handed dentistry are known but lacks literature regarding the usage and implementation of four handed dentistry among dental students during their clinical training in the dental conducted with the aim to assess the attitude and perception about implementation of four- handed along with objectives of comparing attitude and perception of four handed dentistry among third year, fourth year and interns, between deemed, government and private colleges, and between males and females among dental students at institutional

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level.

## METHODOLOGY

A descriptive cross-sectional study was conducted among interns, final year and third year dental students to assess the attitude and perception of four handed dentistry as training tool at institutional level in the state of Maharashtra. Institutional Ethical Clearance was obtained before the Study from IRB Board of the institution.. Students willing to participate in the study and had clinical postings were included in the study and those with unwillingness and with preclinical postings were excluded from the study.

Pilot study was conducted to check the feasibility of questionnaire among 20 students, before the main study, modifications were made to collect the required and relevant information pertaining to the objectives of the study. A closed ended questionnaire was formed and validated with Cronbach Alpha with value 0.82 which was in total agreement. The study was conducted among a total of 250 students and was scheduled between 20/9/2021 to 21/10/2021.

A non-random sampling method was used for data collection. Students Personal E-Mail Id was procured by communicating with different college office and with common friends. questionnaire was sent to their personal email address requesting to consent and participate. Questionnaire was distributed using online google forms. Adequate time was given to participants to understand and respond to the questionnaire. At regular interval Gentle reminders were sent to participate and respond. A total of 14 questions were prepared to evaluate the attitude and perception of implementation of four handed dentistry among dental students at institutional level.

### Statistical Analysis

Data collected was tabulated in MS Excel (2016), Statistical Analysis was done at (95%), Confidence Interval and (80%), power of the study. Chi Square test of proportion was applied. p value less than 0.05 was considered as statistically significant.

## RESULTS

A total of 250 participants responded to the questionnaire. Amongst those 250 participants 195 (78.6%), were females and 53 (21.4%), were males (Table 2).

All participants were dental students of third (30.2%), fourth year (43.3%), and internship (26.5%), (Table 1).

Among all participants 8 (3.2%), were from deemed universities, 14 (5.6%), were from government colleges, 226 (91.1%), were from private colleges affiliated by MUHS (Table 1).

About the awareness about four handed dentistry, 237 (95.2%), were aware about four handed dentistry 12 (4.8%), were unaware about four handed dentistry. The chi-square test showed statistically high significant difference between the responses.

When questioned regarding how many of them have taken or offered help to colleagues while performing dental procedure 235 (94.4%), subjects have taken or offered help while performing dental procedure. There were 224 (90%), subjects consider implementation of four handed dentistry beneficial during clinical training in dental curriculum to be beneficial to learn psychomotor skills. About 229 subjects (91.9%), agreed that the four handed dentistry increases the quality and productivity of dental treatment. About (91.9%), participants agreed that the four handed dentistry reduces the duration of dental treatment.

From the responses it was observed that there were 120 (48.2%), who agreed that the presence of their colleague can affect the quality of their

work. There (53%), participants who believed that the skills of their colleague will affect the quality of their work. There were 229 (92.3%), where comfortable assisting their colleague or being assisted by them, and it will reduce the operators fatigue respectively. 160 (64.8%), subjects agrees that four handed dentistry reduces contamination and cross infection in working environment, while 30 (12.2%), disagrees for the same 57 (23.1%), subjects were neutral about it. when questioned preferred assistant while performing a dental procedure 114 (46.2%), subjects would like to have batchmates 17 (6.9%), opted to have a junior 97 (39.3%), opted for senior while 19 (7.7%), subjects wanted paramedical staff 230(93.5%), subjects agrees that four handed dentistry improves the patient management skills 3 (1.2%), disagrees for the same 13 (5.3%), were neutral about it 194 (78.2%), subjects favoured that four handed dentistry among students will motivate patients to seek dental care, while 3 (1.2%), subjects were not in favor 51 (20.6%), subjects were not so sure about it.

## DISCUSSION

Currently no relevant studies have been conducted on implementation of four handed dentistry among students at institutional level. Hence, exact and appropriate discussion among the research results couldn't be constructed. However appropriate and honest attempt has been done to rationalise the discussion. No significant difference was found in the responses of students of third year, final year BDS and internship. Similarly, no such significant difference was found in the responses of the subjects from deemed universities, private and government colleges of Maharashtra. This could be due to the same curriculum followed in all the colleges that is according to the DCI. There was a statistically significant difference observed between the genders about the knowledge of four handed dentistry. This probably might be due to majority of the female participants in the study and thus has scope of further studies.

Dental students have been trained to use chair side assistants since 1960<sup>[1]</sup>. As trained, competent chair side assistants work constantly with the dentist in performing technical procedure, it saves time and minimizes stress associated with practice of any form of conventional procedure.

Although studies have proved the benefits of four handed dentistry in clinical practice, there is lack of literature regarding knowledge and perception about implementation of four handed dentistry during clinical training among dental students at institutional level.

According to this study, majority 237 (95.2%), of the subjects were aware about four handed dentistry and its technique through their theory curriculum but lacks clinical practice of the same at institutional level. (Table 1).

Four handed dentistry requires a skilled assistant to carry out a procedure 235 (94.4%), subjects have offered or accepted assistance and found it beneficial, which implies they are in favour using four handed dentistry as a part of learning method. Similar to the study conducted where they suggested that efficient exchange of instruments between the operator and the dental assistant was fundamental to facilitate the efficient and stress-free dental practice<sup>[5]</sup>. The four handed team work style increases dentist's focus and decreases his role play in other activities<sup>[6]</sup>. Majority of the participants 229 (92.3%), were comfortable assisting or being assisted by a colleague and majority of them

114 (46.2%), would prefer their batchmates assistance while performing dental procedure. This probably could be because of better understanding and comfort amongst batchmates (Table 2).

Majority of the subjects (91.9%), consider implementation of four handed dentistry increase productivity and quality of dental treatment.

A study shows that no product can increase productivity and reduce stress and strain on the dental team as much as using the singular concept of four handed dentistry<sup>[7]</sup>. Similar findings were found in a study regarding comparison of students productivity in four handed clinic and regular un assisted clinic<sup>[8]</sup>. According to a study about ergonomics in dentistry, good working ergonomics is essential so that work capability, efficiency and high clinical level of treatment can be maintained throughout the working life of dental professionals<sup>[9]</sup>. Another study proves that four handed dentistry is ergonomically the most favourable way to provide dental services since it minimizes undesirable movement of the operating team and expatiates the progress of dental procedures<sup>[10]</sup>. Majority of the participants (90%), think that implementation of Four handed dentistry during clinical training in dental curriculum will be beneficial to learn psychomotor skills better. Psychomotor learning is the process by which the capability for skilled motor control becomes represented in memory<sup>[11]</sup>. As Four handed dentistry provides motion effective environment for the operator, which improves psychomotor skills<sup>[3]</sup>. According to Watson, psychomotor skills are acquired through cognitive process including attention and observation. Thus, assisting a colleague will help improve psychomotor skills<sup>[12]</sup>.

According to Hawthorne effect, subjects change or improve their behaviour when being evaluated. This study shows (48.2%), subjects agreed that the presence of a colleague will affect the quality of their work .

Many participants in this study about 229 (92.3%), agree that four handed dentistry reduces operators fatigue in physical and emotional sense. In a study regarding work related to musculoskeletal disorders among dental students in Malaysia , it was found that discomfort at the neck and Upper back region was reported by 336 students (82%), Students who practiced four-handed dentistry at their dental school were less likely to report symptoms in both elbow ( $p < 0.05$ ), and forearm

( $p < 0.05$ )<sup>[13]</sup>. A study shows most of the physical problems occur due to prolonged seating hours<sup>[1]</sup>.

According to this study, majority (64.8%), participants think that four handed dentistry will help reduce contamination and cross-infection in working environment.

Disinfection & cleaning of the dental chair & working or other surfaces & safe practices of segregation & disposal of waste including blood & saliva laden cotton, tissues, mercury, etc, can be a hectic task for a single operator after performing procedures. The assistance provided helps the operator to perform dental procedures with utmost clinically safe instruments & highly clean environment. This was in correspondence with a study about infection control in dental practice which proves enhanced clinical efficiency and infection control by implementing principles of four handed dentistry<sup>[15]</sup>.

Manipulation of the dental materials & other secondary steps involved in the dental procedure can done by the assistance which can eventually reduce the chances of cross infection & workload of the operator. Thus, four handed dentistry can improves the maintenance of sterilization & disinfection protocol during & after the dental procedures.

According to this study 194 (78.2%), of participants consider four handed dentistry will motivate the patients to seek dental care as it will reduce the patient discomfort during operative procedures. Due to reduced treatment duration, patient discomfort due to mouth opening for extended period of time can be reduced. These findings were in consensus with a study conducted by Kenali et.al in which implementation of true four handed dentistry reduces treatment time and minimizes unnecessary body movements when compared with conventional method<sup>[4]</sup>.

Dentist should have good communication skills with patient to ensure quality oral health services and patient motivation which includes detailed explanation of the diagnosis, investigations and treatment plans and instructions regarding postoperative care, maintenance of oral health and health education. These might be a tedious and lengthy task for a dental student on his own, thus assistance provided by a colleague can be helpful for patient motivation and reduce the treatment time with improved quality of oral health services

**Table 1:** Knowledge and attitude of the participants about four handed dentistry

Questions	Answer	Percentage	p value
Have you heard of four handed dentistry?	Yes	95.6%	<0.001*
	No	4.4%	
Do you know the technique of four handed dentistry?	Yes	87.6%	<0.001*
	No	12.4%	
Have you ever taken or offered help to your colleague while performing a dental procedure?	Yes	94.4%	<0.001*
	No	5.6%	
Do you think implementation of four handed dentistry during clinical training in dental curriculum will be beneficial to learn psychomotor skills better?	Yes	90%	<0.001*
	No	1.6%	
	Not sure	8.4%	
Do you think four handed dentistry among students increases the productivity and quality of dental treatment?	Strongly Agree	35.3%	<0.001*
	Agree	56.6%	
	Neutral	7.6%	
	Disagree	0.5%	
	Strongly Disagree	0%	
Do you think four handed dentistry among students will reduce the duration of treatment time?	Strongly Agree	34.5%	<0.001*
	Agree	57.4%	
	Neutral	6.4%	
	Disagree	1.7%	

	Strongly Disagree	0%	
Do you think the presence of your colleague will affect the quality of your work?	Strongly Agree	16.5%	<0.001*
	Agree	31.7%	
	Neutral	22.5%	
	Disagree	28.5%	
	Strongly Disagree	0.8%	
Do you think four handed dentistry will reduce the operator's fatigue in physical and emotional sense and enhance physical well-being?	Strongly Agree	39.1%	<0.001*
	Agree	53.2%	
	Neutral	6.5%	
	Disagree	1.2%	
	Strongly Disagree	0%	
Do you think four handed dentistry helps to reduce contamination and cross infection in working environment?	Strongly Agree	21.1%	<0.001*
	Agree	43.7%	
	Neutral	23.1%	
	Disagree	7.7%	
	Strongly Disagree	4.5%	
Do you think four handed dentistry among students will improve the patient management skill?	Strongly Agree	34%	<0.001*
	Agree	59.5%	
	Neutral	5.3%	
	Disagree	1.2%	
	Strongly Disagree	0%	
Do you think four handed dentistry among students will motivate patients to seek dental care?	Yes	78.2%	<0.001*
	No	1.2%	
	Not Sure	20.6%	

**Table 2:** Perception of the participants about assistance during dental procedure

	Strongly Agree	17.7%	<0.001*
	Agree	35.3%	
	Neutral	18.5%	
	Disagree	27.7%	
	Strongly Disagree	0.8%	
Will you be comfortable assisting your colleague or being assisted by them?	Yes	92.3%	<0.001*
	No	2.45	
	Not Sure	5.2%	
Who's assistance would you prefer while performing a dental procedure?	Batchmate	46.2%	<0.001*
	Junior	6.9%	
	Senior	39.3%	
	Paramedical Staff	7.7%	

## CONCLUSION

Implementation of four handed dentistry among students at institutional level can increase the productivity and quality of dental treatment and decrease operator's fatigue associated with it while making the learning process more efficient and easier. Hence implementation of four handed dentistry among students during clinical training in dental curriculum will be beneficial to learn psychomotor skills better.

## Conflict of Interest

None declared.

## Financial Support

None declared.

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