



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

INTERNATIONAL JOURNAL  
OF CURRENT RESEARCH

International Journal of Current Research  
Vol. 14, Issue, 04, pp.21277-21281, April, 2022  
DOI: <https://doi.org/10.24941/ijcr.43297.04.2022>

## RESEARCH ARTICLE

# LATERAL THINKING SKILLS FOR CHAIRSIDE DECISION MAKING AMONG DENTAL PROFESSIONALS IN TAMILNADU, INDIA- A CROSS-SECTIONAL STUDY

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### ARTICLE INFO

#### Article History:

Received 29<sup>th</sup> January, 2022  
Received in revised form  
26<sup>th</sup> February, 2022  
Accepted 19<sup>th</sup> March, 2022  
Published online 30<sup>th</sup> April, 2022

#### Keywords:

Lateral Thinking, Dentists, Clinical, Decision Making.

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### ABSTRACT

**Background:** Lateral thinking in general helps to find new alternate way for many problems and helps to solve the issues in the most simple and efficient way. **Aim:** This study aims to find out the lateral thinking skills for chairside decision making among dental professionals in Tamilnadu, India. **Materials and Method:** A cross-sectional study was conducted among 159 dental professionals in Tamilnadu based on the simple random sampling method to evaluate the usage of lateral thinking skills for chairside decision making. A questionnaire consists of 15- items such as demographic data and usage of lateral thinking were used to record the data. The collected data were tabulated and analyzed using descriptive statistics and chi-square test. P-value < 0.05 was considered to be statistically significant. **Results:** There was a statistically significant association was found in years of clinical practice concerning gender (P=0.043) and qualification (P<0.001). The frequency of lateral thinking usage was found to be statistically significant with gender (P=0.009), years of clinical practice (P=0.008) and qualification (P=0.002). **Conclusion:** To date, there was only very little research about the usefulness of lateral thinking in dental clinics. The purpose of this paper is to outline the role of lateral thinking to dentistry and this study also provided evidence for the presence of lateral thinking in dentistry. It also paves a pathway for researchers to conduct further studies.

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**Citation:** Vaishnavi, S., Dinesh Dhamodhar, Suganya, P., Prabu, D., Rajmohan, Bharathwaj, V.V. Sindhu, R. and Prashanthi, M.R. "Lateral thinking skills for chairside decision making among dental professionals in Tamilnadu, India- A cross-sectional study", 2022. *International Journal of Current Research*, 14, (03), 21277-21281.

## INTRODUCTION

In today's world of education, we concentrate on academic knowledge. We are taught to improve our clinical skills. Hard skills and soft skills are essential in the practice of dentistry. While hard skills deal with technical proficiency, soft skills relate to personal values and interpersonal skills. An increase in service industry and competitive practitioners emphasizes the need for soft skills (or) people skills which increase confidence, professionalism and friendliness of the individual to a greater extent.

These skills contribute to the success of organizations that deal face to face with clients. Problem-solving is also one of the soft skills where the clinician should take responsibility and initiative to solve the problems creatively. A dental practice needs skills, clinical knowledge and experience for achieving success<sup>(1)</sup>. Lateral thinking differs from traditional thinking in approaching a problem from different angles by different use of information. Psychologist Edward de Bono first coined the term Lateral thinking is a skill which can be fostered by specific techniques. The liberation of old ideas and stimulation of new ones are the twin aspects of lateral thinking<sup>(2)</sup>. DeBono theorizes that the human brain was designed to organize information into patterns.

Once the patterns were established, the brain sticks to them. On the one hand, this regularity was reasonable because the surroundings look familiar and felt secure. At the same time, it leads to fixed perceptions and rigid thinking, relying on low-risk creativity which fails to break out existing patterns. DeBono offers lateral thinking as a way out of established pattern and forms new and better pattern<sup>(3)</sup>. In vertical thinking or traditional thinking, one has to move forward by sequential steps and each of which must be justified. Lateral thinking uses creative approaches and one may have to be wrong at some time to achieve the correct solution. Lateral thinking was generative and vertical thinking was selective. Vertical thinking was used to dig the same hole deeper, whereas lateral thinking was used to dig a hole in a different place. But lateral thinking cannot replace vertical thinking; it can only compliment it<sup>(4)</sup>.

Lateral thinking was closely related to creativity. But creativity is often considered to be a description of the result (or) something that is an eye-catcher. In contrast, lateral thinking is the description of the process, which includes using the available information and presenting it creatively and differently. One can only admire the result, but one should also learn to use the process. Lateral thinking will give rise to new exciting ideas from the one pre-existing or known ideas. It was an essential skill for creativity and innovation<sup>(4)</sup>. Medical practitioner's creativity was directed towards improving the lives of people by solving patient's medical problems. People were infinitely variable and cannot be represented by an equation. So, it demands creativity even to grasp what they were about. Clinicians were often encountered with problems whose diagnosis is not straight forward; here, creativity lies in the way; which they use the stock of knowledge for clinical decision making. To give an understandable explanation about their condition and to make the patients follow specific instructions, he or she needs to consider what words to use and how to express them which also requires lateral thinking<sup>(6)</sup>. Dentistry combines the science of healing and expression of artistic vision. This duality makes this field unique when compared to other health care professionals. To many outsiders, it might seem far-fetched to call the fillings and scaling and other dental procedures creative. Research suggests that the creativity that influences artistic and scientific expression requires a high level of skills and critical thinking. In modern dentistry, it was easy to see artistic roots in all areas from general practitioners to all specialities. For instance, Prosthodontics explores far more than typical bridge and crown procedure; it includes dentists creating entire prosthetic devices for the entire head and neck. In implantology, the focus was on the appropriate placement of the implants, which relies on the dentist's ability to understand the patient's anatomy and envision the final product<sup>(6)</sup>.

Dentists need to tap into their creativity to understand how their work will exist in the patient's body, along with their ability to manipulate its visual presentation in the oral cavity. Cosmetic dentistry is a primary example of art and dentistry. Treatment planning in this field often focuses on the particular arrangement of the teeth and enhancement of the facial features and symmetry. Dental photography is another type of creative expression that assists in documentation and analysis of clinical development<sup>(6)</sup>. Educational psychologists concerned with creative thinking studied this topic for years and here are a few tests that may prove useful in identifying creative or lateral thinkers.

The four most relevant may be the Embedded Figures Test, the Need for Cognition, Tolerance for Ambiguity and the Uses Test<sup>(7)</sup>. The purpose of this research is to familiarise the concept of lateral thinking among dentists and also for dental students to realize the platform for creative expression available to them as future professionals.

## MATERIALS AND METHODS

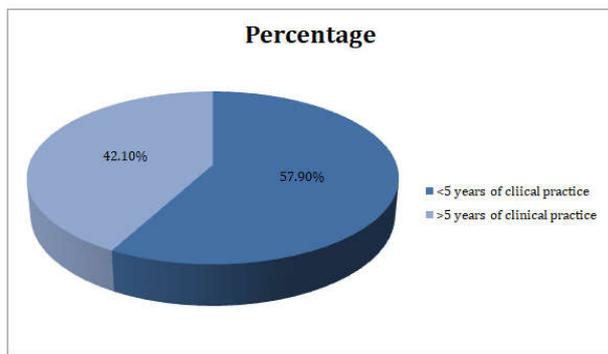
A descriptive cross-sectional study was conducted among the dentists who were practicing in various districts of Tamilnadu to evaluate the importance of lateral thinking in the field of dentistry. The sample size was estimated to be 140 by setting a confidence interval of 95% and an alpha error of being 5%. The Ethical approval of this study was obtained from the Department of Public Health Dentistry, SRM Dental College, Ramapuram. A total number of 159 dentists practicing in Tamilnadu were selected from various dental clinics and hospitals based on the simple random sampling method. The inclusion criteria include only those dentists who were willing to participate and fulfil the questionnaire were selected. The exclusion criteria include those dentists who quitted the clinical practice and those who didn't give the consent form were excluded from the study. Those dentists whose clinics were closed for more than two visits were excluded from the study. A pre-validated questionnaire was modified and finally 15-item closed ended questionnaire was used to record the data. The internal consistency of the questionnaire was evaluated by content validation and the Cronbach's alpha value is 0.8. The questionnaire consists of three domains. The first part includes demographic data such as name, age, sex, years of clinical practice and degree of qualification. The second part consists of the importance of lateral thinking in dentistry and the frequency of implementing lateral thinking in the clinical practice and the third part consists of the difficulties in lateral decision making, patient's opinion, standard of the clinical practice. For data analysis, IBM SPSS statistics for window version 26.0 was used. The collected data were tabulated and analyzed using descriptive statistics and Chi-square test. P-value less than 0.05 was considered to be statistically significant.

## RESULTS

**Table 1. Frequency and Percentage-wise distribution of gender and qualification**

S. No.	Parameters	Variables	Frequency (N)	Percentage (%)
1.	Gender	Males	80	50.3%
		Females	79	49.7%
2.	Qualification	BDS	93	58.5%
		MDS	66	41.5%

Table 1 shows about the percentage and frequency of participants and the parameters considered are gender, Qualification and years of clinical experience. Among 159 dentists who were surveyed, 80 of them were males (50.3%) and 79 were females (49.7%). In case of Qualification there were 93 entries of general practitioners (58.5%) and 66 entries of postgraduates of various specialists (41.5%). Fig 1 depicts the years of clinical practice of dentists with less than five years were ninety-two (57.90%) and those with clinical experience of more than five years were sixty-seven (42.10%).



**Fig 1. Percentage-wise distribution of years of clinical practice experience of dentists**

Table 2 depicts the percentage of the responses of questionnaire regarding lateral thinking in dentistry. Out of 159 participants, 146 (91.8%) dental professionals responded that the lateral thinking is mandatory to the field of dentistry, 153 (96.8%) of dental professionals responded that the implementation of lateral thinking increase the quality of treatment, 132 (83.0%) of dental professionals responded that patient's opinion was mandatory before implementing creative ideas. Table 3 depicts the association of lateral thinking skills in dentistry with respect to gender. There was a statistically significant association was found in years of clinical practice ( $P=0.043$ ), frequency of lateral thinking ( $P=0.009$ ) and difficulties faced during implementation of lateral thinking ( $P=0.014$ ) with respect to gender. Table 4 depicts the association of lateral thinking skills in dentistry based on qualification. There was a statistically significant association was found in years of clinical practice ( $P<0.001$ ), frequency of lateral thinking skills ( $P=0.002$ ), encouragement of teachers/staff in dental for the students to be creative ( $P=0.021$ ) and lacking of lateral thinking skills decreases the quality of treatment ( $P=0.031$ ) with respect to qualification. Table 5 depicts the association of lateral thinking in dentistry based on years of clinical practice. There was a statistically significant difference was found in frequency of lateral thinking skills ( $P=0.008$ ), trouble in implementing lateral thinking skills ( $P=0.039$ ), encouragement of teacher or staffs in dental college for the students to be creative ( $P=0.005$ ), mandatory of patient's opinion for implementing creative ideas ( $P=0.021$ ) with respect to years of clinical practice.

## DISCUSSION

Traditional thinking was based on available data and consists of a series of steps. In contrast, lateral thinking emphasizes on generating ideas and de-emphasizes the details of how those ideas could be implemented. Without lateral thinking, vertical thinking was too narrow-minded and without vertical thinking; lateral thinking would produce more possible solutions but no plans to implement them. The society values and focuses on vertical thinking but lateral thinking skills were considered to be undervalued. When it comes to doctors, they believe that adequate training on systems and specific techniques make them talented in their profession. But when it comes to professions that rely on creative and lateral thinking skills, they tend to assume that those born with those innate talents only can excel them. But even in more vertically minded professions, creativity was seen as a "desirable bonus". Lateral thinking helps to unstuck when we do not know how to move

from one step to another<sup>(8)</sup>. This study helps to create awareness about problem-solving abilities such as lateral thinking that have been successfully applied in business and art, to the forefront of dental healthcare. Apparently results from table 2 highlight the fact that dentists apply lateral thinking skills in their clinics to approach solutions for various clinical problems and they consider it as an important skill. Even though women consider lateral thinking skills a major requirement and they use them in the same frequency as men, they face some discomfort using them. This can be due to fear of failure or any other reasons. The responses from the table are not meant to portray one gender, or the other is better or smarter. This can be explained by an article by a neuroscientist Genevieve Fox on Gendered Brain, shown that the human brains were plastic and mouldable. They were moulded from birth onwards and continue to be moulded. As per the article, if a certain task was given again and again to the person, the task would get better and easier to that person. The human brain reflects the life of people and not just the sex of the owners<sup>(9)</sup>. From table 4, the total number of 'no' responses from both MDS and BDS about being encouraged by staff in college was greater than the total response for 'yes'. Hence faculty should develop opportunities for students to demonstrate lateral thinking and creative skills in predoctoral dental and preclinical environments. By teaching the skill, they can articulate the quality of thinking that supports their decision making so that they are poised to become better clinicians in future. This table highlights the fact that both postgraduate and undergraduate dentists require lateral thinking skill, but it is apparent from the table that postgraduate dentists require and use them more. The results from table 5 depicts that the educators nowadays were not only delivering discrete knowledge via lectures; they also believe that teaching these skills have implication for patient care and they were helping students to be better thinkers. The results from this also indicate that the dentist's problem-solving abilities increased over time with experience. The article "pedagogical formation student's disposition towards lateral thinking" is to determine the student's disposition to lateral thinking. It was also determined to reveal whether there was a difference in a student's disposition in terms of gender. Statistically, the results from the survey stated that male students ( $X=3.77$ ) think much more lateral than female students ( $X=3.66$ )<sup>(10)</sup>. An experimental study which was conducted to correlate achievement and intelligence of student-teacher to lateral thinking stated that there was a slightly significant correlation between lateral thinking and achievement<sup>(11)</sup>.

The article about using the creative technique for the eradication of truancy among students explored how lateral thinking creativity technique could be utilized to teach truant students to think right and take rational decisions that would make them jettison truancy for the success of U.B.E in Nigeria<sup>(12)</sup>. The result from the article showed that there was a significant difference in the post-test scores of the participants as the experimental group scored lower than the control on truancy scale. It should be noted that lower the score on truancy scales the better for the person<sup>(13)</sup>. It was therefore recommended that any student playing truancy should undergo training in lateral thinking creativity technique to reduce truancy and subsequent dropping out of school. The paper shows about how visible light came into dentistry provides an excellent example of 'out of box' lateral thinking translation of innovative scientific technology into dentistry.

**Table 2. Percentage-wise distribution of the responses regarding lateral thinking in dentistry**

S. No.	Questionnaire regarding lateral thinking in dentistry	Percentage of responses	
		Yes (%)	No (%)
1.	Do you think out of box is mandatory to tackle clinical problems?	139 (87.4%)	20 (12.6%)
2.	Does out of box thinking increase the quality of your professional success?	153 (96.8%)	5 (3.2%)
3.	Do you think lateral thinking skills are mandatory in the dental profession?	146 (91.8%)	13 (8.2%)
4.	Is it necessary to include teaching lateral thinking skills for undergraduate dental students?	152 (95.6%)	7 (4.4%)
5.	Do you have any trouble making out of box thinking in your dental practice?	50 (31.4%)	109 (68.6%)
6.	Does the teacher or college in dental college encourage the students to be creative?	75 (47.2%)	84 (52.8%)
7.	Do you think lack of out of box thinking decreases the degree of your profession?	95 (59.7%)	64 (40.3%)
8.	Do you think that a patient's opinion is mandatory before implementing creative ideas?	132 (83.0%)	27 (17.0%)

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6.	Does the teacher or college in dental college encourage the students to be creative?	75 (47.2%)	84 (52.8%)
7.	Do you think lack of out of box thinking decreases the degree of your profession?	95 (59.7%)	64 (40.3%)
8.	Do you think that a patient's opinion is mandatory before implementing creative ideas?	132 (83.0%)	27 (17.0%)

**Table 3. Association of lateral thinking in dentistry with respect to gender**

S. No	Parameters	Responses	Gender		P-value
			Males (%)	Females (%)	
1.	Qualification	BDS	42 (52.7%)	51 (64.6%)	0.123
		MDS	38 (47.5%)	28 (35.4%)	
3.	Years of clinical practice	<5 years	40 (50%)	52 (65.8%)	0.043*
		>5 years	40 (50%)	27 (34.2%)	
4.	Do you think out of the box is mandatory to tackle clinical problems?	Yes	69 (86.3%)	70 (88.6%)	0.654
		No	11 (13.8%)	9 (11.4%)	
5.	How often do you use lateral methods of thinking to tackle clinical problems?	Rare	7 (8.8%)	7 (8.9%)	0.009*
		Sometimes	39 (48.8%)	56 (70.9%)	
		Very often	34 (42.5%)	16 (20.3%)	
6.	Does out of box thinking increase the quality of your professional success?	Yes	76 (95.05)	77 (98.7%)	0.367
		No	4 (5.0%)	1 (1.3%)	
7.	Do you think lateral thinking skills are mandatory in the dental profession?	Yes	71 (88.8%)	75 (94.9%)	0.155
		No	9 (11.3%)	4 (5.1%)	
8.	Is it necessary to include teaching lateral thinking skills for undergraduate dental students?	Yes	76 (95.0%)	76 (96.2%)	0.999
		No	4 (5.0%)	3 (3.8%)	
9.	Do you have any trouble making out of box thinking in your dental practice?	Yes	18 (22.5%)	32 (40.5%)	0.014*
		No	62 (77.5%)	47 (59.5%)	
10.	Does the teacher or staff in dental college encourage the students to be creative?	Yes	32 (40.0%)	43 (54.4%)	0.068
		No	48 (60.0%)	36 (45.6%)	
11.	Do you think lack of lateral thinking decreases the degree of your profession?	Yes	48 (60.0%)	47 (59.5%)	0.948
		No	32 (40.0%)	32 (40.5%)	
12.	Do you think that a patient's opinion is mandatory before implementing creative ideas?	Yes	66 (82.5%)	66 (83.55)	0.861
		No	14 (17.5%)	13 (16.55)	

**Table 4. Association of lateral thinking in dentistry with respect to qualification**

S. No	Parameters	Responses	Qualification		P-value
			BDS (%)	MDS (%)	
1.	Years of clinical practice	<5 years	68 (73.1%)	24 (36.4%)	<0.001*
		>5 years	25 (26.9%)	42 (63.6%)	
2.	Do you think out of the box to tackle your clinical problems?	Yes	80 (86.0%)	59 (89.4%)	0.527
		No	13 (14.0%)	7 (10.6%)	
3.	How often do you use lateral methods of thinking to tackle clinical problems?	Rare	13 (14.0%)	1 (1.5%)	0.002*
		Sometimes	59 (63.4%)	36 (54.5%)	
		Very often	21 (22.6%)	29 (43.9%)	
4.	Does out of box thinking increase the quality of your professional success?	Yes	89 (96.7%)	64 (97.0%)	0.999
		No	3 (3.3%)	2 (3.0%)	
5.	Do you think lateral thinking skills are mandatory in the dental profession?	Yes	84 (90.3%)	62 (93.9%)	0.560
		No	9 (9.7%)	4 (6.1%)	
6.	Is it necessary to include teaching lateral thinking skills for undergraduate dental students?	Yes	89 (95.7%)	63 (95.5%)	0.999
		No	4 (4.3%)	3 (4.5%)	
7.	Do you have any trouble making out of box thinking in your dental practice?	Yes	32 (34.4%)	18 (27.3%)	0.340
		No	61 (65.5%)	48 (72.7%)	
8.	Does the teacher or staff in dental college encourage the students to be creative?	Yes	51 (54.8%)	24 (36.4%)	0.021*
		No	42 (45.2%)	42 (63.6%)	
9.	Do you think lack of out of box thinking decreases the degree of your profession?	Yes	49 (52.7%)	46 (69.7%)	0.031*
		No	44 (47.3%)	20 (30.3%)	
10.	Do you think that a patient's opinion is mandatory before implementing creative ideas?	Yes	80 (86.0%)	52 (78.8%)	0.231
		No	13 (14.0%)	14 (21.2%)	

Table 5. Association of lateral thinking in dentistry based on years of clinical practice

S. No	Parameters	Responses	Qualification		P-value
			<5yrs (%)	≥5yrs (%)	
1.	Do you think your speciality in dentistry requires out of box thinking	Yes	76(82.6%)	57 (85.1%)	0.678
		No	16(17.4%)	10(14.9%)	
2.	Do you think out of the box to tackle your clinical problems?	Yes	77(83.7%)	62 (92.5%)	0.097
		No	15(16.3%)	5 (7.5%)	
3.	How often do you use lateral methods of thinking to tackle clinical problems?	Rare	10(10.9%)	4(6.0%)	0.008*
		Sometimes	62(67.4%)	33 (49.3%)	
		Very often	20(21.7%)	30(44.8%)	
		Yes	90 (98.9%)	63 (94.0%)	
4.	Does out of box thinking increase the quality of your professional success?	Yes	88 (95.7%)	58(86.6%)	0.039*
		No	4(4.3%)	9(13.4%)	
5.	Do you think lateral thinking skills are mandatory in the dental profession?	Yes	88(95.7%)	64 (95.5%)	0.999
		No	4 (4.3%)	3 (4.5%)	
6.	Is it necessary to include teaching creative thinking skills for undergraduate dental students?	Yes	37(40.2%)	13(19.4%)	0.005*
		No	55(59.8%)	54(80.6%)	
7.	Do you have any trouble making out of box thinking in your dental practice?	Yes	54(58.7%)	21(31.3%)	0.021*
		No	38(41.3%)	46(68.7%)	
8.	Does the teacher or staff in dental college encourage the students to be creative?	Yes	50(54.3%)	45 (67.2%)	0.104
		No	42(45.7%)	22 (32.8%)	
9.	Do you think lack of out of box thinking decreases the degree of your profession?	Yes	78(84.8%)	54(80.6%)	0.488
		No	14(15.2%)	13(19.4%)	
10.	Do you think that a patient's opinion is mandatory before implementing creative ideas?	Yes	78(84.8%)	54(80.6%)	0.488
		No	14(15.2%)	13(19.4%)	

**LIMITATIONS:** There might be a chance of gender and age bias. The overestimation or underestimation of the responses from participants causes social acceptability bias which might affect the appropriate results. Further longitudinal studies should be conducted to get a more relevant outcome.

## CONCLUSION

Till date, there has been very little research about the usefulness of lateral thinking in dental clinics. The purpose of this paper is to outline the role of lateral thinking concerning dentistry and the study also provided evidence for the presence of lateral thinking in this field. In the world of increased competition, there was a crying need for the search of innovative solutions; lateral thinking aids dentists not to get locked into methods that do not lead them to an innovative solution. Training creativity and lateral thinking skills within an academic forum will provide students with a means to develop novel outcomes. This might help to rebuild the current deficit in innovations of dental healthcare.

**Acknowledgment:** NIL.

**Source of Funding:** NIL.

**Conflict of Interest:** NIL

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