ARTICLE

EVALUATION OF KNOWLEDGE AND PERCEPTIONS ABOUT RCT AMONG PATIENTS IN MEDICAL COLLEGE IN HIMACHAL PRADESH

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ABSTRACT

Background: Nicholas Ling rightly quoted that ignorance is voluntary misfortune. Same applies to the awareness about Root Canal Treatment (RCT) among people. RCT, on one hand, is one of the most common procedures for which patients visit the dentist in urban cities. On the other hand, lack of knowledge among patients in rural areas about this treatment modality hinders and discourages them from undergoing RCT and saving the carious and problematic tooth. Patients prefer undergoing extraction or removal of the tooth rather than trying to save it. The review of literature shows that there is a paucity of data about the awareness and acceptance of RCT among patients in Indian population. Aim: Thus, the study was conducted with aim to assess patients' awareness of RCT among patients reporting in the Out Patient Department of Dentistry in Maharishi Markandeshwar Medical College and Hospital, (MMMC&H) Kumarhatti, Solan. Material and Methods: This study was conducted using a prestructured questionnaire comprising of 15 questions adopted from Bansal R and Jain A, 2020. After obtaining the informed consent this questionnaire was distributed to 200 random adult patients who attended the OPD Dentistry, MMMC&H, Kumarhatti, Solan. Patients were asked to fill this form to the best of their knowledge. The completed questionnaires were then analysed to assess patients' experiences, concerns, and perceptions about RCT. There is lack of awareness about RCT especially in rural areas of HP. Conclusion: Understanding and identifying the factors that hinder or discourage patients from undergoing RCT is necessary to adequately address the issue. More and more people should be made aware so that they benefit from this treatment modality.

Keywords: Awareness, Questionnaire, Knowledge, Root Canal Treatment

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INTRODUCTION

In today's hectic scenario with modern lifestyle and dietary habits, maintaining good oral health is imperative for overall well-being of an individual. But sometimes, teeth undergo decay which often results in gum swelling and pain. As a result, individual experiences difficulty in eating fibrous or solid food and it affects daily life activities. Dental pain is the commonest reason observed among patients for seeking necessary management, which mainly comprises either Root Canal Treatment (RCT) or extraction of the diseased tooth[1]. Extraction or complete removal of the tooth from its socket may lead to a chain of events such as shifting of adjacent or opposing teeth, affecting the mastication ability and the natural smile and esthetics of the patient are compromised[2]. Moreover, tooth replacement after extraction for esthetic

In Root Canal Therapy (RCT) the diseased or infected pulp which has caused pulpal or periapical pathology is removed[5]. Once the diseased tissue is removed, the canal is disinfected with the help of chemical disinfectants and the root canal is filled with an inert material[6]. This helps to retain the infected teeth that otherwise might have been extracted[7]. Endodontic Therapy or as is commonly known as RCT also helps to preserve the periodontal fibres which attach tooth to the alveolar bone of the tooth socket. They enable the tooth to act as a sensory organ and help in proprioception during jaw movements. These fibres get parted when extraction is performed. But, RCT prevents severance of these essential fibers[8]. Therefore, one should always opt for RCT whenever indicated in order to save the natural dentition.

Though, by means of mass media, awareness about RCT is rapidly spreading its roots in rural areas but still people are reluctant in getting their teeth treated by means of this treatment modality. Fear and anxiety have been considered the main reasons which hold people back in seeking RCT in general[9]. Fear can be attributed to the ignorance of patients about root canal procedures[6]. Patients often do not understand the nature of endodontic treatment and what it involves[10,11].

Studies in the past have highlighted the need to provide more information about it[12-14]. It is important to identify the factors that result in distress among patients and hinder them from undertaking Root Canal Treatment. The review of literature shows there is a paucity of data about the awareness of RCT among patients in Indian population[15,16]. Thus, this study was conducted to assess patients' awareness about RCT and factors influencing the potential acceptance of endodontic therapy among the rural population of Solan, HP.

METHODOLOGY

This cross – sectional study utilised a structured questionnaire adopted from Bansal R and Jain A, 2020[17] was performed on 200 random adult patients who attended the Dental OPD (Out Patient

Department) at MMMC&H, Kumarhatti, Solan, HP. This questionnaire was distributed among those individuals who were willing to participate in the study. It contained 15 questions that assessed patients' knowledge, perceptions and attitude regarding the RCT (Root Canal Treatment). Patients were asked to fill the questionnaire honestly and to the best of their knowledge while they waited for their turn outside OPD, Dentistry. Data was collected and statistically analysed to obtain the results in percentage and assess the patients' experiences, concerns, and perceptions about RCT.

Informed consent was taken from all the patients who participated in the study. Approval from Institutional Ethics Committee was obtained on 03.03.2026 (MMMCH/IEC/26/1151).

prior to the start of the study.

Inclusion criteria

- Patients over the age of 18 years
- Patients coming to the Dental OPD at MMMC&H, Kumarhatti for their dental evaluation.
- Patients willing to participate in the study

Exclusion criteria

- Patients less than 18 years of age
- Uncooperative patients

Table 1: Detailed Questionnaire		
Q.1	Do you know about RCT?	Yes, I have previous RCT experience Not really, have heard about it from sources such as internet, TV, radio, relatives/friends but I don't know the details (proceed to Q. 6) No, I do not know anything (proceed to Q. 6)
Q.2	Have you experienced pain during the RCT or inter-appointment phase?	Yes No
Q.3	Do you experience persistent pain in root canal-treated tooth ≥6 months after the RCT got completed?	Yes No
Q.4	What were the number of visits required for RCT done?	1 visit 2-3 visits ≥4 visits
Q.5	Have you got a post-endodontic RCT restoration and crown placement done?	Yes No
Q.6	When do you think RCT is indicated for a tooth?	Only when pain associated with the tooth is present The tooth might need RCT, even if it doesn't hurt
Q.7	After what duration of pain have you reported for treatment?	Within 1-3 days Within 1-3 weeks More than 1 month
Q.8	Do you self-medicate to resolve any tooth infections?	Yes Pain killers alone Antibiotics alone Painkillers and antibiotics No
Q.9	What you think is the role of antibiotics in RCT?	Resolve endodontic infection so mandatory during or after RCT Not mandatory
Q.10	Do you think teeth become weaker after RCT?	Yes No
Q.11	Are you concerned about the treatment time?	Single-visit treatment preferred regardless of quality of treatment Quality of treatment matter and not no. of visits
Q.12	What is your most unpleasant or anxiety-arousing aspect associated with the RCT?	Pain during or after root canal therapy Local anaesthetic injection Sensation of files worked in root canals The need to remove the tooth despite undertaken treatment
Q.12	Do you prefer a specialist or a general practitioner for RCT?	Root canal specialist General dentist
Q.14	Do you think getting RCT is too expensive?	Yes No
Q.15	Will you undergo RCT, if indicated for any tooth or will you prefer extraction?	RCT Extraction

RESULTS

The findings from the individual questionnaire were drawn together and the results were analysed to find out patients' awareness about RCT. Results obtained are summarized in Tables 2–5.

Table 2: Awareness about RCT in patients				
Questions Response No. of patient questioned	No. of Responses	% Responses		
Do you know about RCT?	No, I do not know anything about RCT (proceed to Q. 6)	200	102	51%
	Not really, have heard about it from sources such as internet, TV, radio, relatives/friends but I don't know details (proceed to Q. 6)		40	20%
	Yes, I have previous RCT experience		58	29%

Table 3: Experience of previously root canal-treated patients about RCT				
Questions Response No. of patients questioned	No. of responses	% of responses		
Have you experienced pain during the RCT or inter-appointment phase?	Yes No	58	45 13	77.6% 22.4%
Do you experience persistent pain in root canal-treated tooth after ≥6 months after the RCT got completed?	Yes No	58	10 48	17.2% 82.8%
What was the number of visits required for RCT done?	1 visit 2-3 visits 4 visits or more	58	14 35 9	24.2% 60.3% 15.5%
Have you got a post-endodontic (RCT) restoration and crown placement done?	Yes No	58	25 33	43.1% 56.9%

Table 4: Patient's perceptions regarding RCT				
Questions Response No. of patients questioned	No. of responses	% of responses		
When do you think RCT is indicated for a tooth?	Only when pain associated with the tooth is present	200	143	71.5%
	The tooth might need RCT, even if it doesn't hurt		57	28.5%
After what duration of pain have you reported for treatment?	Within 1-3 days	200	44	22%
	Within 1-3 weeks		97	48.5%
	More than 1 month		59	29.5%
Do you self-medicate to resolve any tooth infections?	Yes	200	175	87.5%
	Pain killers alone		107	61.1%
	Antibiotics alone		25	14.3%
	Painkillers and antibiotics			
	No		43	24.6%
			25	12.5%
What you think is the role of antibiotics in RCT	Resolve endodontic infection so mandatory during or after RCT	200	155	77.5%
	Not mandatory		45	22.5%

Table 5: Patient's attitude toward RCT				
Questions Response No. of patients No. of % of questioned Response Response				
Are you concerned about the treatment time?	Single-visit treatment preferred regardless of the quality of treatment Quality of treatment matter and not no. of visits	200	162 38	81% 19%
Do you think teeth become weaker after RCT?	Yes No	200	140 60	70% 30%
What are your most unpleasant or anxiety-arousing aspects associated with the RCT?	Pain during or after root canal therapy Local anaesthetic injection Sensation of files worked in root canals The need to remove the tooth despite undertaken treatment	200	95 53 15 37	47.5% 26.5% 7.5% 18.5%
Do you prefer a specialist or a general practitioner for RCT?	Root canal specialist General Dentist	200	80 120	40% 60%
Do you think getting RCT is too expensive?	Yes No	200	138 62	69% 31%
Will you undergo RCT, if indicated or will you prefer extraction?	RCT Extraction	200	65 135	32.5% 67.5%

DISCUSSION

In a broader perspective when an individual's health is compromised, the quality of life also gets affected to a large extent. Though, now a days younger and middle aged people are giving importance to selfcare and are pro-active in getting even a slightest symptom checked with the doctor but on the other hand, people in rural areas in India, still consider prioritising their health as a luxury which they cannot afford

In present study, 51% patients disclosed that they were hearing about RCT for the first time. This is a relatively high percentage in comparison to a study by Habib et al (2017)[18] and Bansal and Jain (2020)[17] where 25.3% and 24.44% of the respondents respectively had no knowledge about RCT. This high percentage in the present study might be attributed to the fact that this study was conducted in rural part of Solan district where majority of people are village inhabitants and minimally educated. In the present study 20% of the respondents revealed that they have heard about RCT from relatives/friends or other sources such as internet, TV, radio, etc., but lack adequate knowledge about the procedure [Table 2]. This finding is consistent with the study by Parirokh M et al, 2015[19]. The percentage is relatively low because middle aged and elderly people in rural areas still lag behind in terms of internet usage owing to lack of knowledge and limited means. 29% of patients admitted that they knew about this treatment modality due to their own previous RCT experience.

In the present study 77.6 % patients who had undergone RCT earlier in life reported having experienced pain at some point during or after RCT. This finding is consistent with that of Bansal and Jain (2020)[17] [Table 3]. Postoperative pain, induced by RCT is severe in nature and is more frequent than any other dental procedures[20]. The etiology comprises of mechanical, chemical, and/or microbial injury to dental tissues induced or exacerbated during RCT[21].In addition, psychological factors too influence pain perception[22]. It often requires non scheduled emergency visit for urgent care. Informing patients about expected Post Endodontic Pain (PEP) and prescribing medications to manage it can increase patient confidence in their dentists, increase patients' pain threshold, and improve their attitude toward future dental treatment[23].

However, persistent pain, is different from Post Endodontic Pain in the sense that it is present ≥ 6 months after completion of endodontic treatment. The causes may be either odontogenic or non -odontogenic[24]. In our study, 17.2% of patients with previous RCT experience revealed that they feel persistent pain in RCT treated tooth [Table 3].

According to a study conducted in 2013 by Gaikwad et al[25] 52.4% of practioners complete RCT in three visits. The reason behind is that dentist is better able to assess how the tooth reacts to the treatment during the interappointment phase by means of patient experiencing any discomfort or pain during that phase. It provides a better judgement regarding the clinical outcome. Our study also revealed that the majority (60.3%%) patients with previous RCT experience got their treatment completed in 2–3 visits, whereas 24.2% patients had single visit endodontics followed by 15.5% patients who paid ≥4visits for treatment [Table 3]. Now a days, with the advent of technology in every field including endodontics combined with high precision tools and automated gadgets younger dentists opt for single visit endodontics compared to traditional multiple visit protocol thus saving both time and energy.

In the present study, only 43.1 % of patients with previous RCT experience got a post-endodontic restoration and crown placement done [Table 3]. Gillen et al[26] reported that appropriate coronal coverage after RCT is as critical as high-quality RCT for the integrity of the periapical tissue. Another study by Aquilino and Caplan[27] reported that Endodontically Treated Teeth (ETT) not crowned are 6 times more likely to get extracted than teeth crowned after RCT. In a study conducted by Saunders et al[28] crown fracture (60%) was considered the main factor for carrying out extractions of the majority of patients, which could probably have been prevented by the timely placement of a crown after RCT. Also, a well-sealed restoration such as full coverage crown could prevent potential microleakage, which has long been considered a major cause of endodontic failure and tooth loss after RCT. Therefore, it is imperative that post endodontic restoration and crown placement must be done after RCT in order to increase the longevity of the treated tooth.

Many a times in case of long-standing infection the affected tooth creates a tunnel through the tissue to drain pus since it has no other way to drain. This tunnel presents as a draining fistula. It prevents the pressure from building up and hence the patient does not experience any pain. In such scenario pain is not the criterion but still tooth is indicated for RCT[29]. Also, dental pulp may be affected by traumatic dental injuries. In such cases, tooth loses its vitality, may present with coronal discoloration but still remain asymptomatic[30]. Absence of pain does not always mean that tooth does not require endodontic treatment. However, our study revealed that 71.5% patients think tooth has to be associated with pain if indicated for RCT [Table 4]. This can be attributed to lack of knowledge and awareness among participants of the study.

In the present study majority participants 48.5% revealed that they wait for the dental pain to get relieved by itself and go to dentist only if pain doesn't subside within 1–3 weeks. While 22% patients reported that they don't delay and go to dentist within 1–3 days of feeling dental pain. However, 29.5% patients revealed that they wait for about a month's duration for pain to settle on its own and go to dentist only if it doesn't stop bothering them. Pain is an essential defense mechanism that ensures a healthy life. Where teeth are concerned, pain is the alarm that warns us of threatening situations, such as invasion by cariogenic bacteria, or dental fracture[31]. Moreover, if carious tooth is left untreated; bacteria from the infected tooth pulp can travel into periapical tissues to cause a painful, pus-filled abscess, which will require urgent treatment. So, dental pain should not be ignored and required treatment should not get delayed[17].

In today's hectic life style every person wants to save money and time. Patients using analgesics on their own to treat dental pain is a classic example that supports this statement. Studies have also indicated high prevalence of self-medication among females considering that they have lower threshold towards pain and tend to seek medical help more promptly as compared to males[32,33]. Our study results are in consistence with other studies demonstrating self- medication being highly prevalent (87.5 %) among dental patients with almost 61% patients taking pain killers on their own to get relief from dental pain. However, it becomes imperative pharmacists should stop prescribing drugs to the patients without consultation in order to avoid any harm.

Antibiotics are used both systemically and topically in order to treat infections related to root canal system[34]. But clinically, thoroughly debriding the diseased root canal and providing a passage for abscess to drain forms the basis for successfully managing the endodontic infection[35]. However, earlier study suggest that patients lack knowledge and consider dental pain and facial swelling would get subsided if they self-medicate with antibiotics and analgesics[36].Our study is also in close relation to this finding. Results showed that 77.5% patients considered use of antibiotics mandatory for resolving endodontic infection whereas 22.5% of patients think antibiotics are not mandatory. It is important for the public to acknowledge the fact that every dental problem does not necessitate the use of antibiotics. Over and improper use of antibiotics often leads to antimicrobial resistance which can pose a serious threat to public health.

In our study, 81% of patients preferred single- over multiple-visit treatment regardless of the quality of treatment [Table 5]. This is fairly high percentage as compared to study by Bansal and JAIN[17]. It may be attributed to the fact that in the present study mostly participants belonged to rural areas. They livelihood depends upon taking care of their fields and cattle. They consider going to dentist multiple times for their own health shear wastage of time and resources so much so that they don't even bother about the quality of treatment. Moreover according to another study multiple-visit treatment is not associated with a better quality of RCT compared to single-visit treatment[37].

When questioned whether RCT makes tooth weaker, majority (70%) of the participants agreed to it and remaining 30% denied it. According to a study by Reeh et al[38] there is no difference in the rate of fracture between endodontically and non-endodontically treated teeth. However, teeth requiring root canal treatment are quite often structurally compromised as a result of caries, previous restorations, or trauma. As a result, they require extensive post and core build up in order to retain a full coverage coronal restoration. This requires additional removal of dentin and probably serves to further weaken the tooth, which may account for the increased occurrence of tooth fracture[39]. So, it would be wrong to say that RCT weakens the tooth. There are many factors responsible for causing tooth fracture.

It has been observed in the past that anxiety and fear for dental procedures have been considered the common reasons among patients for avoidance in seeking dental treatment[40].The mere sight of needle and various sounds in dental operatory are enough for some patients in declining any dental services offered. In the present study, fear of pain was stated as the most common reason (47.5%) which aroused anxiety among patients followed by fear of local anaesthetic injection (26.5%), the need to remove the tooth despite undertaken treatment (18.5%), and the sensation of files being worked in root canals was quoted as the least common factor arousing stress among participants of the study (7.5%) [Table 5]. According to a study by Logia ML et al[41] patients' psychological status, their emotions and anxiety may sometimes lead them to overestimate the pain they felt. Also, another study reported that young and adult patients feel more pain than older adults[42]. Considering all these factors patients should be counselled well regarding pain management, practice deep breathing and relaxation techniques prior to starting of any treatment.

In the present study, only 40 % patients prefer specialist over general dentist for RCT [Table 5]. This is a rather surprising finding and is not in accordance with earlier studies[1,17] which revealed 86.6% and 92% patients of respective study preferred a root canal specialist over general dentist for RCT. This may be attributed to the low educational background and lack of knowledge of the patients in the present study which hinders them from seeking quality dental treatment from a specialist. People of rural areas do not prioritise their health. Moreover, they are of the opinion that specialist would charge more money for the same treatment than the general dentist. It is very important that health awareness reaches every nook and corner of villages in India so that even if people are not educated but they should be wise enough to make fair decisions for their better health.

In our study, 69%% patients agreed that they find RCT too costly [Table 5]. The result is close to the study by Bansal and Jain[17]. RCT is a technique sensitive procedure. It requires patience, skill and more time of the dentist. It usually takes 2-3 visits to complete the procedure rather than restorations or extraction which can be accomplished within a single visit. So, it is justifiable for RCTs to be on the bit costly side. Moreover, if a person gets his tooth extracted and get it replaced with implant or prosthesis, it would cost him more than RCT. Also, the fact cannot be ignored that RCT saves the inherent dentition. So, it can be considered a long- term investment.

In the present study, majority 67.5%) participants preferred extraction over RCT [Table 5]. Reason behind making such a choice may be that people in this study are not properly educated nor motivated enough to undertake any treatment. Moreover, it might be possible that some of them might have had a painful experience while undergoing dental treatment in the past. This fear of pain might be responsible for such avoidance behaviour for RCT[43].If anyhow, patient experiences sudden pain during treatment which has not been explained before, patient tend to lose confidence in operating dentist. Therefore, patients should be accurately informed before hand, about the pain associated with endodontic therapy. Prescribing medication for pain management helps to foster a positive attitude among patients. The literature suggests that people with good dental health knowledge show more likelihood of seeking dental care[44].Thus, there is a need for educating and motivating patients to save their natural dentition by means of RCT.

CONCLUSION

Our study provided an understanding of patient's perceptions, opinions and level of awareness regarding RCT and helped in getting an insight about the fears and misconceptions attached to the treatment procedure. Our study revealed that there is an urgent need of addressing the issue of lack of awareness about dental health services in rural areas. People in villages need not only be made aware about the health facilities but also need to be motivated to overcome the mental hurdles, come forward and get treated for the health which they truly deserve.

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