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KNOWLEDGE AND AWARENESS OF ROOT CANAL TREATMENT THERAPY IN THE EASTERN INDIAN POPULATION: A CROSS-SECTIONAL STUDY.

Conocimiento y conciencia de la terapia de
tratamiento del conducto radicular en la población
de la India oriental: un estudio transversal.

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ABSTRACT:

Objective: To evaluate the awareness of root canal treatment therapy in the rural population of Eastern India.

Introduction: The most common reason for which a patient visits any dental setup is tooth pain. Most people in the rural population are not aware of root canal treatment therapy nor of medications that are used for tooth pain management in case of emergency. Lack of adequate knowledge of root canal therapy leads to tooth pain and swelling which lead to worsening issues. This is further complicated by self-management at home by taking clove and essential oils. Hence this study was conducted to evaluate the knowledge and awareness of the rural population of Eastern India regarding root canal therapy and medications used during tooth pain and the course of root canal treatment.

Material and Methods: A pre-structured, closed-ended questionnaire was applied to patients visiting the Department of Dentistry, Fakir Mohan Medical College and Hospital, Balasore, Odisha (India). The questionnaire consisted of twenty multiple-choice questions. The questions were framed to understand the level of awareness of the sample population. The data was collected and analyzed for descriptive statistics such as mean and percentages.

Results: 72% had firsthand experience of tooth pain at some point in time. Around 34% of the responders who had been treated in the past replied that they did not have any knowledge and awareness about root canal treatment, whereas the remaining 66% reported they had treatment done from a dentist before and were advised over the counter analgesics like paracetamol and ibuprofen. The majority of the patients were unaware of root canal treatment and antibiotics used during the treatment such as metronidazole, amoxicillin, and amoxicillin-clavulanate.

Conclusion: There is a lack of awareness and knowledge regarding root canal treatment and medication used during tooth pain and its course of treatment.

KEYWORDS:

Root canal therapy; awareness; surveys and questionnaires; rural population; pain management; anti-bacterial agents.

RESUMEN:

Objetivo: Evaluar el conocimiento de la terapia de tratamiento del conducto radicular en la población rural del este de la India.

Introducción: La razón más común por la cual un paciente visita cualquier instalación dental es el dolor. La mayoría de las personas en la población rural no conocen la terapia de tratamiento del conducto radicular ni los medicamentos que se utilizan para el manejo del dolor de dientes en caso de emergencia. La falta de un conocimiento adecuado de la terapia del conducto radicular provoca dolor e hinchazón que empeoran los problemas. Esto se complica aún más con el automanejo en casa utilizando clavo de olor y aceites esenciales. Por lo tanto, este estudio se realizó para evaluar el conocimiento y la conciencia de la población rural del este de la India con respecto a la terapia del conducto radicular y los medicamentos utilizados durante el dolor de muelas y el curso del tratamiento del conducto radicular.

Material y Métodos: Se entregó a los pacientes que visitaban el Departamento de Odontología, Fakir Mohan Medical College and Hospital, Balasore, Odisha (India) un cuestionario pre-estructurado y cerrado, que constaba de veinte preguntas de opción múltiple. Las preguntas se enmarcaron para

comprender el nivel de conciencia de la población muestral. Los datos fueron recolectados y analizados con estadísticas descriptivas como media y porcentajes.

Resultados: El 72% tuvo experiencia de primera mano con el dolor de dientes en algún momento. Alrededor del 34 % de los que respondieron que habían sido tratados en el pasado respondieron que no tenían ningún conocimiento ni conciencia sobre el tratamiento del conducto radicular, mientras que el 66 % restante informó que se había realizado un tratamiento con un dentista anteriormente y que se les aconsejó analgésicos de venta libre como paracetamol e ibuprofeno. La mayoría de los pacientes desconocían el tratamiento de conducto y los antibióticos utilizados durante el tratamiento, como metronidazol, amoxicilina y amoxicilina-clavulanato.

Conclusión: Existe una falta de conciencia y conocimiento sobre el tratamiento de conducto y la medicación utilizada durante el dolor de muelas y su curso de tratamiento.

PALABRAS CLAVE:

Tratamiento del conducto radicular; concienciación; encuestas y cuestionarios; población rural; manejo del dolor; antibacterianos

INTRODUCTION.

One of the most common reasons a patient visits a dental center is toothache. However, toothache can be due to a variety of reasons, with the most common reason being pulpal involvement due to caries.¹ Upon presentation of a patient with toothache, the question arises as to the cause and whether the tooth can be saved through root canal treatment and restoration or needs to be properly extracted and replaced. Each presentation is unique and there is no perfect answer.²

Root canal treatment or therapy (RCT) refers to a procedure, wherein the infected dental pulp is removed to allow healing of periapical tissues, thereby restoring form, function, and esthetics.^{3,4} Lack of root canal treatment leads to excessive destruction of the tooth to a non-restorable state, and eventual

loss of the tooth. Sequelae of tooth loss includes drifting of teeth, collapsed occlusion, opening up of contacts, loss of masticatory efficiency, and loss of esthetics.^{5,6}

Most patients are unaware of the root canal treatment procedure and fear it because it is presumed to be painful.^{7,8} Various studies in the past had emphasized the need to increase the level of awareness about root canal treatment.⁹ Although RCT is prevalent in urban cities, there is a lack of awareness about it in rural areas, which ultimately results in tooth loss, poor esthetics and loss of function.¹⁰

All these factors contribute to a loss of patient self-confidence and self-esteem. Thus, the present study aimed to assess the level of knowledge and awareness about root canal therapy in the rural

population in the state of Odisha in India. This will not only benefit the rural population but will also enable the government to bring these treatments closer to rural populations.

This study will also aid in reforming health policies for rural populations with special emphasis on dental treatment.

MATERIALS AND METHODS.

This cross-sectional questionnaire study was conducted for fourteen months, from December 2018 to February 2020, in the Department of Dentistry, Fakir Mohan Medical College and Hospital, Balasore, Odisha (India).

Ethical clearance was obtained from the institutional ethics committee. Study participants for the present study were selected based on the following inclusion and exclusion criteria:

Inclusion Criteria

1. Patients over 18 years old, with permanent teeth erupted and exposed to the oral cavity over some time.
2. Patients providing informed consent and willing to participate in the study.

Exclusion Criteria

1. Patients who did not provide consent.
2. Uncooperative patients.
3. Patients below the age of eighteen years.
4. Patients who were mentally not stable.
5. Patients belonging to the field of medicine or dentistry.

A pre-structured, closed-ended questionnaire consisting of twenty items was given randomly to patients visiting the department, in their local language for easy understanding. The study was explained to the patients and informed consent was obtained. The questionnaire used was based on the questionnaire from a study by Janczarek *et al.*,¹¹ with some minor modifications.

The questionnaire consisted of twenty multiple-choice questions. The questions were framed to understand the level of awareness of the sample population regarding root canal therapy, their experience, cost, and concerns. Also, the criteria

for choosing a particular dental set up for the said treatment were evaluated. The data was collected and analyzed for descriptive statistics such as mean and percentages.

RESULTS.

A total of 1000 study participants responded to the questionnaire and after evaluation of the appropriateness of the responses, they were subjected to statistical analysis. Of the total participants, 574 were male and 426 were female. The most common age group that responded was between 18 to 40 years. In the present study, 72% of patients disclosed that they were learning about RCT for the first time. Twenty-eight percent of the responders, who were aware of RCT, owed it to their own firsthand experience. (Table 1)

Seventy two percent had had first-hand experience of tooth pain at some point in time. Around 34% of the responders who had been treated in the past, answered that they did not have any knowledge about root canal treatment, whereas the other 66% reported they had received the treatment from a dentist and were advised over the counter analgesics like paracetamol and ibuprofen. The majority of the patients were unaware of the antibiotics used during the treatment like metronidazole, amoxicillin, and amoxicillin-clavulanate. Our study reveals that 76% of responders equated tooth pain with extraction, irrespective of the treatment options available or proposed. Around 25% of respondents answered they primarily depended on over the counter analgesics. (Table 1)

Around 62% of the respondents believed that the tooth has to eventually be extracted despite any medication prescribed and treatment performed. Whereas 27% of patients were concerned regarding the pain that might be felt during the treatment, the remaining 11% were concerned about the high cost of treatment. The fear of pain during needle puncture for anesthesia was the primary concern while discussing the need to provide anesthesia.

The vast majority of patients (83%) agreed that they believed that teeth that were treated became

Figure 1. Study participants' criteria for selecting dental clinic in percentage (N = 1000).

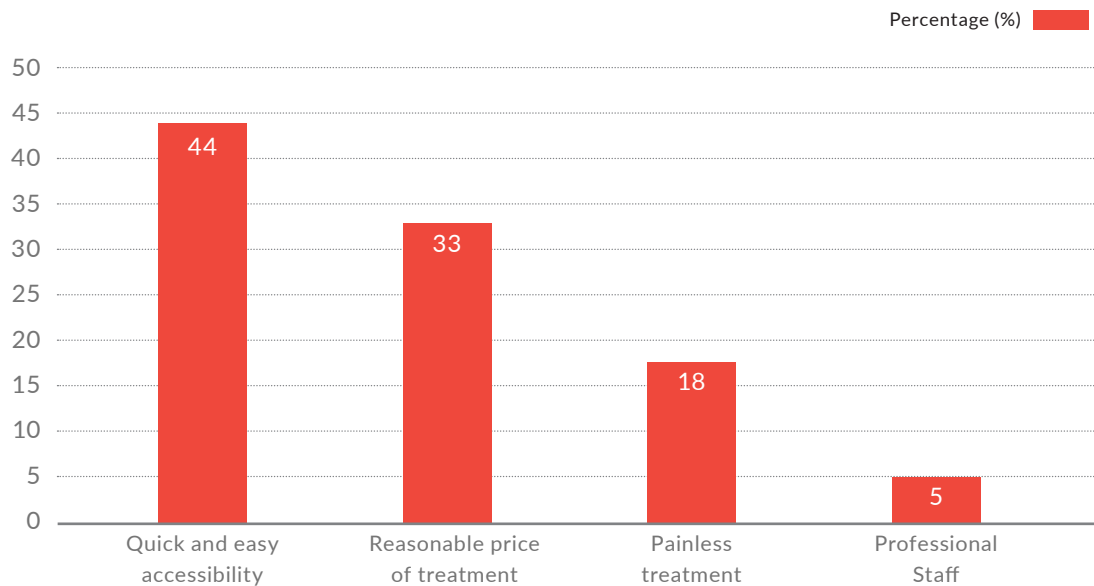


Table 1. Characteristics frequency of Cone-Beam Computed Tomography (CBCT) included in this study.

Gender	Male	57.4 (574)
	Female	42.6 (426)
AWARENESS OF ROOT CANAL TREATMENT		(N) %
Heard Root Canal Treatment for the first time		72 (720)
Heard Root Canal Treatment before (experience)		28 (280)
Experienced pain during Root Canal Treatment?	Yes	72.1 (202)
	Do not remember / don't know	27.8 (78)
Was RCT performed by a specialist?	Don't Know	34 (95)
	From BDS doctor	66 (185)
Cost of Root Canal Treatment?	Too expensive	78.2 (219)
	Could Manage / affordable	21.8 (61)
Aware of harmful effects of radiation?	Yes	10.7 (30)
	No	89.3 (250)

Table 2. Perception and beliefs related to toothache and its treatment among study participants (N = 1000).

FACTORS	(N) %
Associate tooth pain with extraction	76 (760)
Depend on Over the Counter pain killers	25 (250)
Tooth has to go be extracted, irrespective of treatment	62 (620)
Might experience pain during treatment	27 (270)
High cost of treatment	11 (110)
Tooth becomes weak after treatment	83 (830)

weaker and on suggestion may require crowns. (Table 1)

In our study, 78% of the responders found the treatment and medications too expensive. Quick and easy access was the primary criterion (44%) for selecting a dental clinic, followed by reasonable price (31%), painless treatment (18%), and professional staff (7%).

Among patients of poorer economic background, free of charge treatment was the primary criterion. (Figure 1)

DISCUSSION.

Oral health in India and more importantly in states like Odisha, has suffered due to lack of awareness. Various dental procedures such as endodontic therapy, oral prophylaxis, and even basic restorations are looked upon with dread and apathy by the general public and even much of the medical community due to lack of knowledge and awareness.¹²⁻¹⁴

The result is that most of the teeth that could be saved by existing dental treatments, particularly RCT that can save decayed teeth, are subjected to extraction.^{15,16} Root canal therapy helps in the preservation of the periodontal fibers, which play an important role in proprioception and hence help in the preservation of the temporomandibular joint.^{17,18}

Factors affecting the treatment modality being decided not only on diagnosis but also on the dentist's judgment on the expected outcome, patient's awareness of the procedure, socioeconomic status, expectations and attitude towards the treatment, and also the patient's past experiences whether subjective or objective. Only when we understand the level of awareness regarding RCT, can we give more emphasis to patient education and motivate patients to undergo RCT rather than extraction of teeth.

In this study, a vast majority of patients disclosed that they were hearing about RCT for the first time and most of those who had heard about RCT before only knew about it vaguely. The familiarity with the terminology among those who responded positively to being aware of RCT was due to the passive

reception of information from their friends, family, and acquaintances. Though, there is an upswing in the level of awareness primarily in the under-thirty-year age group, which may be credited to increased access to the internet.

The present study disclosed that the majority of respondents equated tooth pain with extraction, irrespective of the treatment options available or offered. This can in part be attributed to a very low level of awareness and preconceived notions of lack of competence among practitioners.

Many of the study participants hailed from rural and semi-rural areas, where quackery is quite prevalent. Such service providers either guide patients towards extraction or some form of medication. This may be due to the understanding that despite being aware that the tooth can be saved with root canal treatment, the dental providers lack the necessary skills, hence an easier way out with extraction is chosen.

Some of the respondents indicated they depend on over the counter analgesics to avoid visiting the dentist until the pain becomes unbearable. The same group of respondents sometimes also resort to home remedies such as applying mustard oil on the overlying cheek region along with heat to relieve pain or applying clove oil in the adjacent buccal mucosa and doing warm saline rinses. Few patients may place the analgesics directly adjacent to the affected tooth. The most common reason for self-medication was to avoid treatment altogether and to save money.

The majority of the respondents believed that the tooth has to eventually be extracted despite any treatment performed, hence they want to avoid treatment such as RCT altogether and move on directly to extraction. Lack of knowledge and awareness about root canal treatment leads to excessive destruction of the tooth to a non-restorable state, and eventual loss of the tooth. Sequelae of tooth loss include drifting of teeth, collapsed occlusion, opening up of contacts, loss of masticatory efficiency, and loss of esthetics, resulting in patient low self-esteem and confidence.

If teeth are left untreated, pulpal infection may spread to periapical tissues and lead to severe com-

plications. In some patients, due to progression to a chronic condition, there might be a sinus tract, which leads to a state of reduced pain with occasional flare-ups.^{18,19} In patients with a history of trauma, the tooth might have turned non-vital with a chronic periapical infection, the only sign of which is discoloration. In such cases, the tooth needs RCT even if there is no pain.^{20,21}

In this study, a vast majority of participants found RCT too expensive. There was a lack of awareness regarding the complexity of the treatment. It is a difficult myth to dispel, as every treating doctor fees differ, with RCT being more expensive than routine dental restorative procedures.^{22,23}

The patients need to be made aware of the level of complexity of the treatment and the higher level of skill required, as well as of the advantages of saving one's teeth from over-extraction and future replacement. The patients need to be made aware of the long term biological and economic benefits of RCT.^{24,25} This not only helps in saving patient teeth but also provides psychological benefit to the patient.^{26,27}

Results of the present study are similar to a previous study conducted in 2018 in Saudi Arabia by Ahamed et al. They are also in accordance with a recent study by Bansal *et al.*¹⁶ This suggests that there is lack of knowledge and awareness regarding root canal treatment across regions but the situation is worse in rural areas due to financial constraints and low education. This study helps us to assess the knowledge of community and understanding patient attitude towards root canal treatment. This is of high importance in countries like India where oral health is often neglected.

Limitations of the study

As this study is based on a questionnaire survey it has a possibility of response bias. This study only represents the views of patients visiting the department of dentistry at Fakir Mohan medical college and hospital, Balasore, Odisha, India, thus generalization of data is limited.

People from other parts of Odisha and India may have different views. Further studies should be undertaken on a larger scale, taking into consideration a possible variability in responses among populations of different socioeconomic strata and different regions of the country, in order to develop a better understanding of attitude levels toward root canal treatment procedure.

CONCLUSION.

There is a lack of awareness and knowledge regarding root canal treatment and medications used for tooth pain and its course of treatment.

Therefore, there is a need to extensively educate the general public regarding the importance of saving their teeth by root canal treatment and medications available to reduce their pain and infection. Involving professionals who may bring these treatments to people through non-profit organizations or changes in public policies is crucial.

Conflict of interests:

The authors declare no conflict of interest.

Ethics approval:

Study was approved by the Institutional review committee of Fakir Mohan Medical College and Hospital, Balasore, Odisha (India).

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Authors' contributions:

Both authors contributed equally to the manuscript.

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