

Dissertation training

at

Smile India Dental Clinic

Estimating Standard Time for Common Operating Procedure (Root Canal Treatment) in a Dental Setting.

by

Dr Shalini Jha

PG/23/104

Under the guidance of

Dr Altaf Yousuf Mir

PGDM (Hospital and Health Management)
(2023-25)



**International Institute of Health Management
Research, New Delhi**

Certificate of Approval

The following dissertation titled **Estimating Standard Time for Common Operating Procedure (Root Canal Treatment)** at **IIHMR Delhi** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

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Mukesh

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Completion of the Dissertation from the respective organisation

The certificate is awarded to

Dr Shalini Jha

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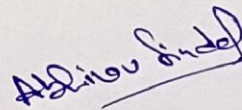
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10th June, 2025

Smile India Dental Clinic

She comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning.

We wish her all the best for future endeavours.



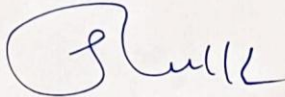
Head Of Department

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr Shalini Jha**, student of PGDM (Hospital & Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at **Smile India Dental Clinic** from **15th April, 2025 to 10th June, 2025**.

The Candidate has successfully carried out the study designated to her during internship training, and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfilment of the course requirements. I wish her all success in all her future endeavours.



Dr. Sumesh Kumar
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi


Mentor
IIHMR, New Delhi

To
The Head of Clinic
Smile India Dental Clinic
Dwarka, New Delhi
Dated: 10th April, 2025

Subject: Request for Permission to Conduct an Observational Study

Dear Dr Jindal,

I am Dr. Shalini Jha, a postgraduate student pursuing my degree under roll number PG/23/104. I am currently conducting a dissertation study titled "Estimating Standard Time for Common Operating Procedure (Root Canal Treatment) in a Dental Setting."

The purpose of this study is to observe and analyse the time required for various stages of root canal treatment (RCT) to establish a standardised timeframe. This data will be crucial in enhancing efficiency, improving scheduling accuracy, and optimising resource utilisation in dental practices.

The study is observational, involving no direct interaction with patients. It consists of time tracking of the different stages of RCT, such as patient preparation, anaesthesia, cleaning and shaping, obturation, and post-treatment instructions.

With due respect, I request your kind permission to conduct this study at Smile India Dental Clinic, Dwarka, New Delhi, between 15th April 2025 and 10th June 2025. I assure you that all observations will be conducted without disrupting routine clinical operations, and confidentiality will be strictly maintained.

Your cooperation in this academic endeavour would be deeply appreciated. Thank you for your time and consideration.

Warm regards,
Dr. Shalini Jha
PG/23/104
IIHMR, Delhi

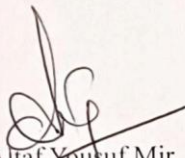
Permitted
Abhinav Jindal
10/4/25
Dr. Abhinav Jindal
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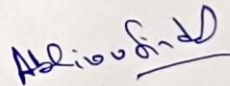
Certificate from Dissertation Advisory Committee

This is to certify that **Dr. Shalini Jha**, a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. She is submitting this dissertation titled "**ESTIMATING STANDARD TIME FOR COMMON OPERATING PROCEDURE (ROOT CANAL TREATMENT) IN A DENTAL SETTING**" in partial fulfilment of the requirements for the award of the **PGDM (Hospital & Health Management)**.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.



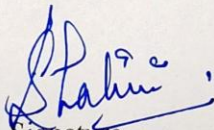
Dr Altaf Yousuf Mir,
Associate Professor



Dr Abhinav Jindal
Head of the dental clinic

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT
RESEARCH, NEW DELHI
CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **Estimating Standard Time for Common Operating Procedure (Root Canal Treatment) in a Dental Setting** and submitted by **Dr Shalini Jha** Enrolment No. **PG/23/104** under the supervision of **Dr Altaf Yousuf Mir** for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from **15th April, 2025 to 10th June, 2025** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.


Signature

FEEDBACK FORM

Name of the Student: Dr Shalini Jha

Name of the Organisation in Which Dissertation Has Been Completed:
Smile India Dental Clinic

Area of Dissertation: Dental domain

Attendance:

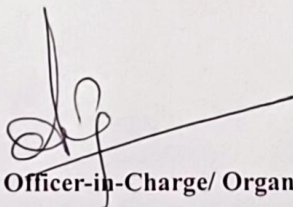
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Suggestions for Institute (course curriculum, industry interaction,
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Signature of the Officer-in-Charge/ Organisation Mentor (Dissertation)

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CERTIFICATE ON PLAGIARISM CHECK

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Course Specialization (Choose one)	Hospital Management ☒	Health Management	Healthcare IT
Name of Guide/Supervisor	Dr./Prof.: ALTAF YOUSUF MIR		
Title of the Dissertation/Summer Assignment	ESTIMATION OF STANDARD TIME FOR A COMMON OPERATING PROCEDURE (ROOT CANAL TREATMENT) IN A DENTAL SETTING.		
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Acknowledgement

This report is an outstanding opportunity to convey my gratitude to those many people whose timely help and guidance went a long way in finishing this project.

I would like to express my sincere thanks to the Smile India Dental Clinic for giving me an opportunity to conduct an observational study on the topic of estimating standard time for root canal procedure.

This dissertation could not have been completed without the guidance and support of my mentor, **Dr. Altaf Yousuf Mir**, Associate Professor and **Dr Punit Yadav**, Professor, IIHMR Delhi

I am grateful to **Dr Abhinav Jindal**, Head of the Smile India Dental Clinic, for guiding me in my dissertation.

Last but not least, I would like to thank my friends, family members and all those people who helped me with the completion of my dissertation.

Working on this project has proved to be an enlightening experience for me.

Estimating Standard Time for Common Operating Procedure (Root Canal Treatment) in a Dental Setting.

SECTION- I

INTRODUCTION

ABOUT THE DENTAL CLINIC

Smile India Dental Clinic, located in Sector 19, Dwarka, New Delhi, is a private dental setting with two dental chairs.

It was established in 2010 by Dr. Abhinav Jindal.

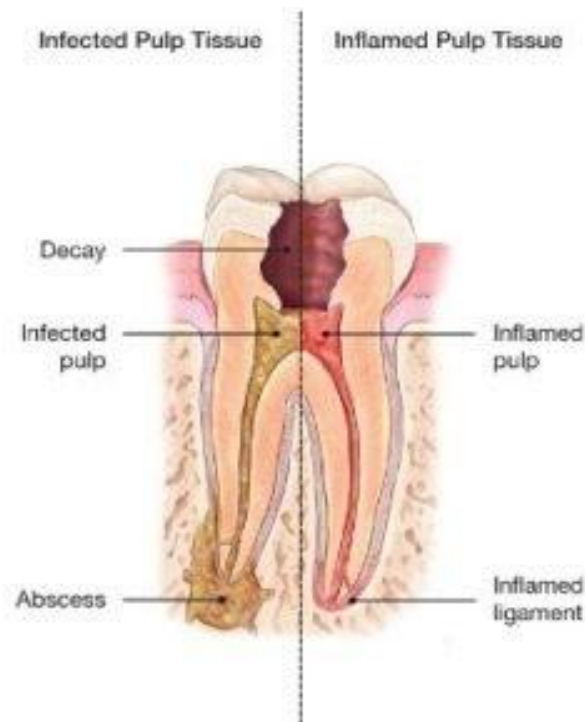
Currently, the doctors working here, along with Dr. Abhinav Jindal, are Dr. Shalini Jha and Dr. Shahid.

The clinic utilises the latest technologies in root canal treatments to provide painless procedures for patients.

The motto of the dental clinic is to give painless and satisfactory treatment to the patients

INTRODUCTION ABOUT ROOT CANAL TREATMENT

A root canal treatment is a dental procedure to remove inflamed or infected pulp on the inside of the tooth which is then carefully cleaned and disinfected, then filled and sealed. Root canal treatment is designed to eliminate bacteria from the infected root canal, prevent reinfection of the tooth and save the natural tooth.



Inside your tooth, beneath the white enamel and a hard layer called dentin, is a soft tissue called pulp. This tissue contains blood vessels, nerves and connective tissue, which help grow the root of your tooth during its development. A fully developed tooth can survive without the pulp because the tooth continues to be nourished by the tissues surrounding it.

Advantages of root canal treatment

- Efficient chewing
- Normal biting force and sensation
- Natural appearance
- Protects other teeth from excessive wear or strain

There are a few symptoms that mean you might need a root canal- (“What Happens If You Leave A Root Canal Untreated?”)

- Severe pain while chewing or biting
- Pimples on the gums
- A chipped or cracked tooth
- "Lingering sensitivity to hot or cold, even after the sensation has been removed" (“Understanding Root Canals | 8 Things You Should Know”)
- Swollen or tender gums
- Deep decay or darkening of the gums

A root canal typically takes between 90 minutes and 3 hours. It can sometimes be done in one appointment, but may require two.

PROBLEM STATEMENT

There is a lack of standardised time estimation for RCT procedures, leading to scheduling inefficiencies, increased patient wait times, and variability in clinical workflows.

ABSTRACT

This study aims to establish a standardised time estimate for root canal treatment (RCT) procedures in a dental setting. By analysing various stages of the procedure, including patient preparation, anaesthesia administration, canal shaping, obturation, and post-treatment care, the study will provide a standardised timeframe for efficiency and patient scheduling. The findings will help optimise clinical workflows, reduce patient wait times, and improve resource allocation in dental practices.

OBJECTIVES

1. To analyse the time required for different stages of root canal treatment
2. To provide suggestions for optimising procedure efficiency.

SIGNIFICANCE OF STUDY

The findings will assist dental practitioners in better scheduling, improving patient satisfaction, and optimising resource utilization.

INCLUSION & EXCLUSION CRITERIA

INCLUSION:

- Age- 18 to 65 years.
- Primary RCTs.
- Includes Anterior, Premolars and 1st & 2nd molars.
- Teeth diagnosed with Irreversible Pulpitis, Symptomatic/ Asymptomatic apical periodontitis, Pulp necrosis.
- Cases manageable by general dental practitioners and do not require specialist referral.
- Patients who provide their written consent to participate in the study and allow the recording of procedure duration.

EXCLUSION:

- Re-RCTs.
- Wisdom Tooth RCTs.
- Non- cooperative patients.
- Emergency visits such as a Hot tooth.

SECTION- II

MATERIALS AND METHODS

STUDY DESIGN

A cross-sectional observational study in a dental clinic.

SAMPLE SELECTION:

Purposive Sampling.

SAMPLE SIZE

A minimum of 30 RCT procedures.

DATA COLLECTION

Breakdown of procedure stages:

1. Patient Preparation & Aesthesia
2. Access Cavity Preparation
3. Canal Cleaning & Shaping
4. Obturation & Sealing
5. Post-Operative Instructions

Time tracking through direct observation.

Consideration of influencing factors (e.g., tooth type, complexity, operator experience).

ANALYSIS TOOLS

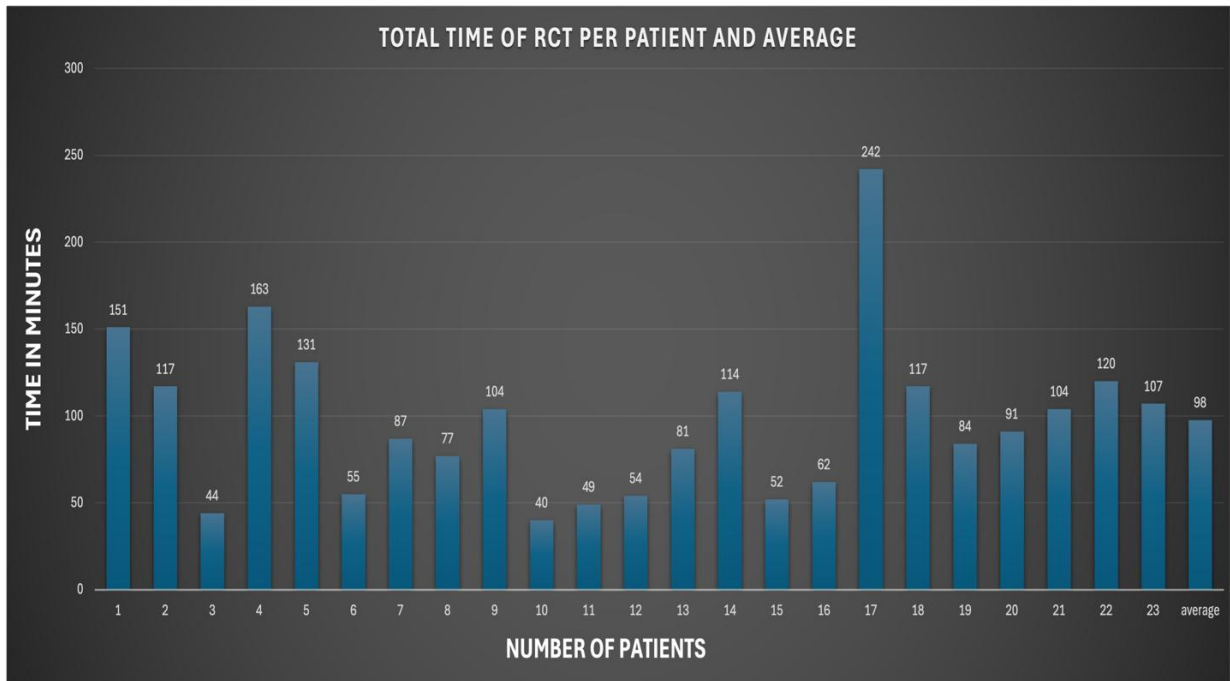
MS Excel for calculating TAT.

Pareto Chart to categorise potential causes of delay.

EXPECTED RESULTS AND CONTRIBUTION

- Identification of an average time for RCT procedures.
- Recognition of significant factors affecting treatment duration.
- Practical suggestions for optimising treatment efficiency.

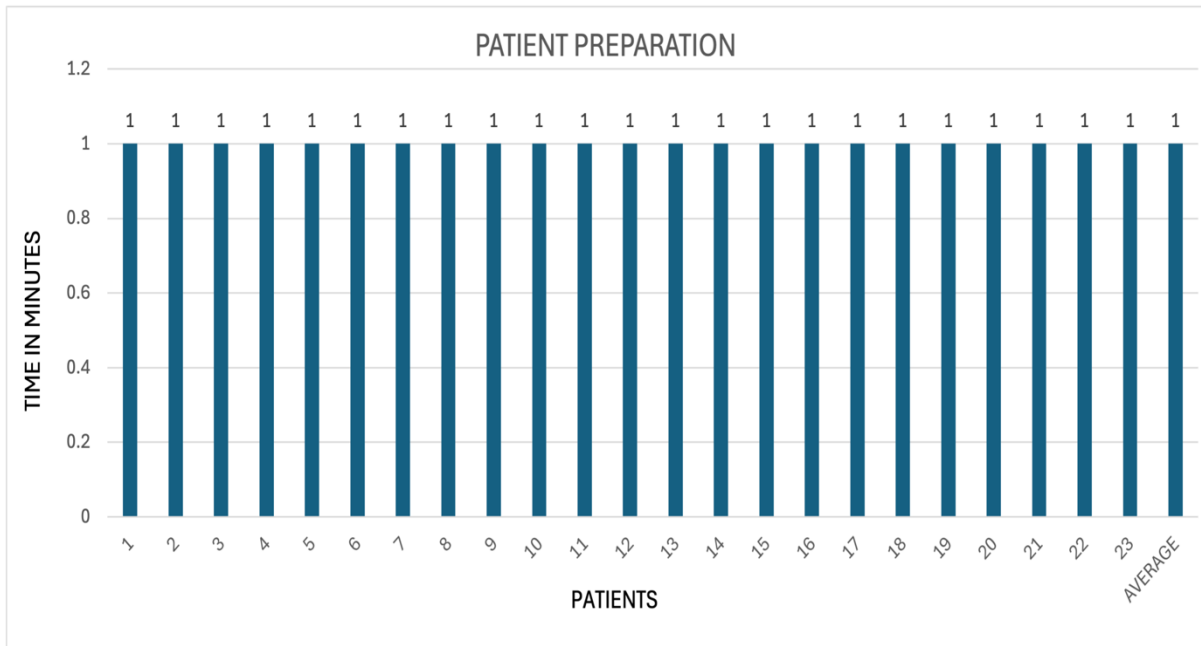
DATA ANALYSIS & INTERPRETATION



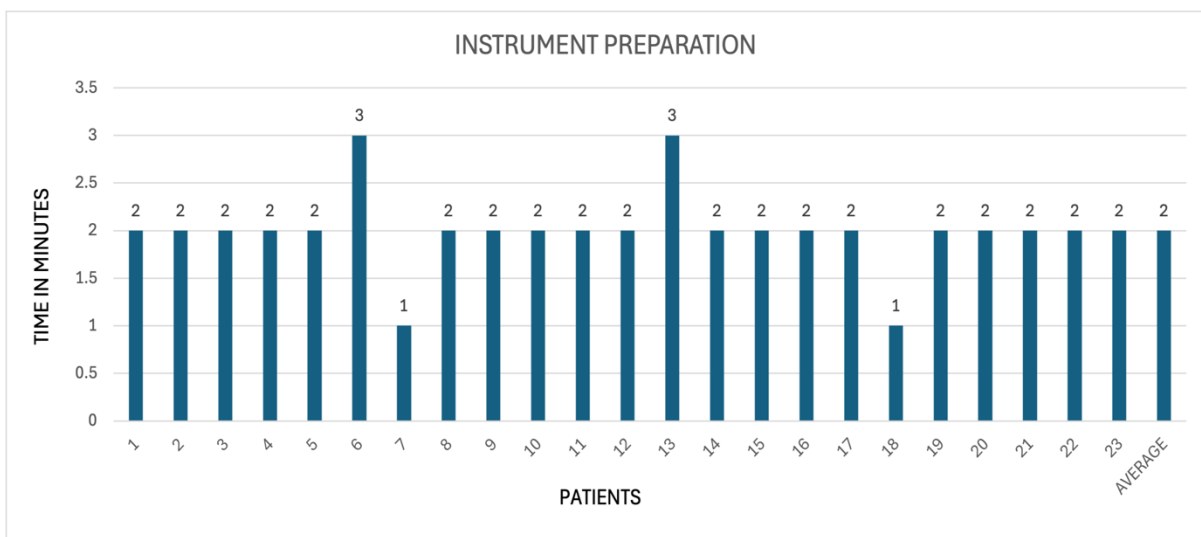
INTERPRETATION:

- The total number of patients observed was 23
- The average time taken to complete one root canal treatment is 98 minutes.
- The maximum time was 242 Minutes, that is 4 hours. Tooth No.27 (First molar)
- The minimum time was 40 minutes. Tooth No. 43 (Canine)

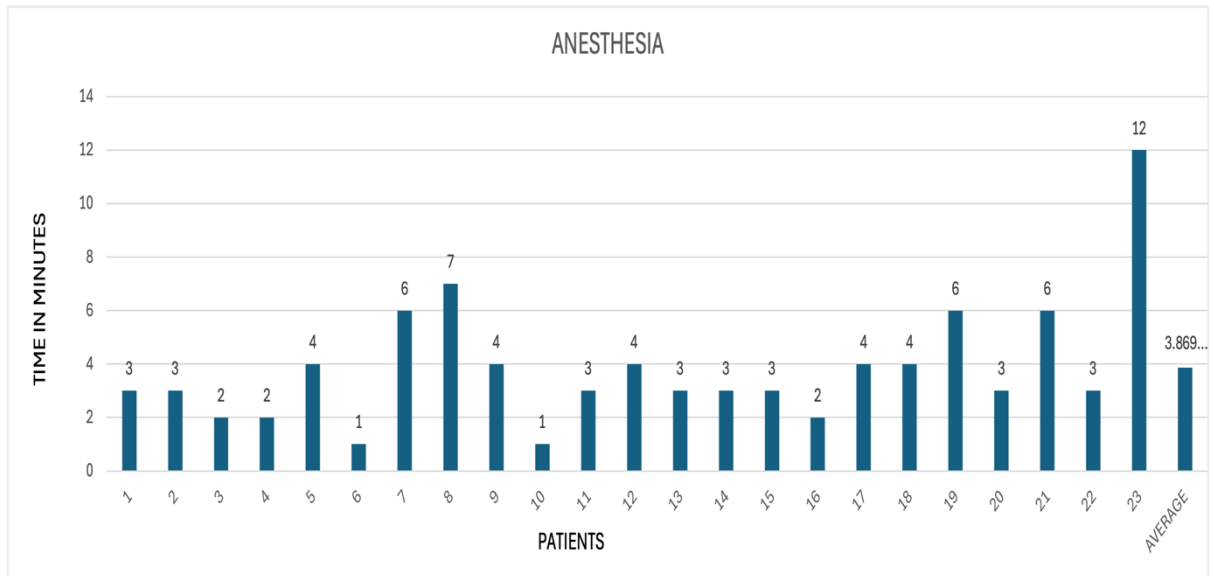
RESULTS & INTERPRETATION OF EACH PROCEDURE



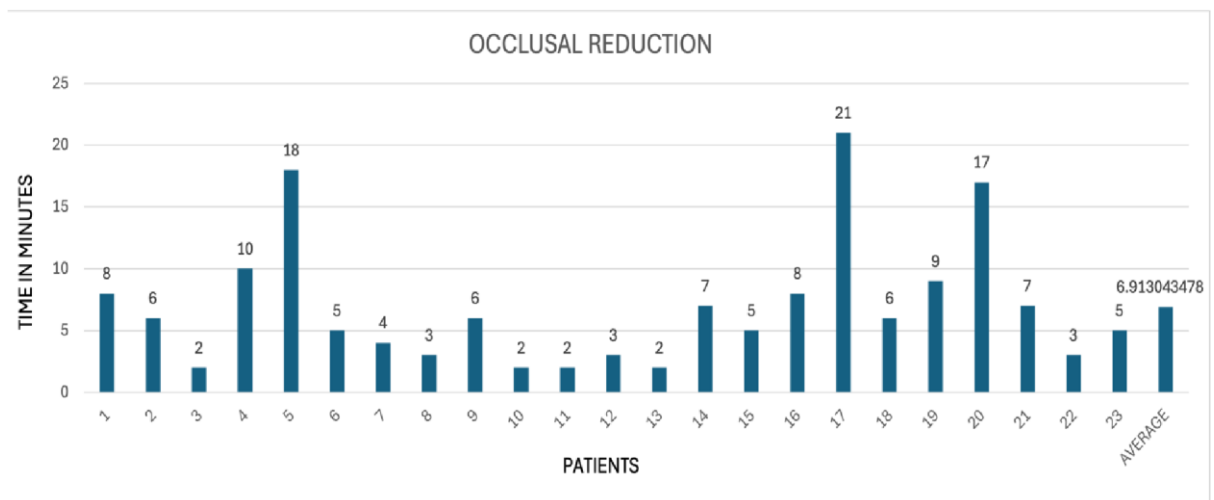
Interpretation: Patient preparation mostly takes one minute—**reasons:** Trained attendants. Just patient draping is required.



Interpretation: The average time required to prepare the instruments was 2 minutes.
Reasons: preparing the instruments beforehand in case of appointments.

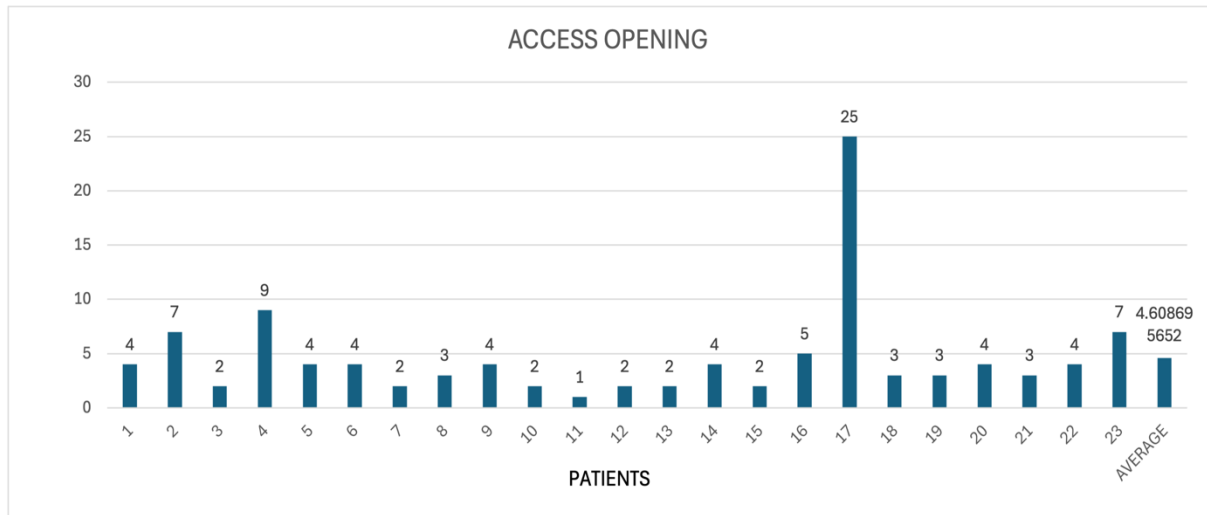


Interpretation: The average time taken to give anaesthesia was 4 minutes.- **Reasons:** it depends on the area to be anaesthetized.

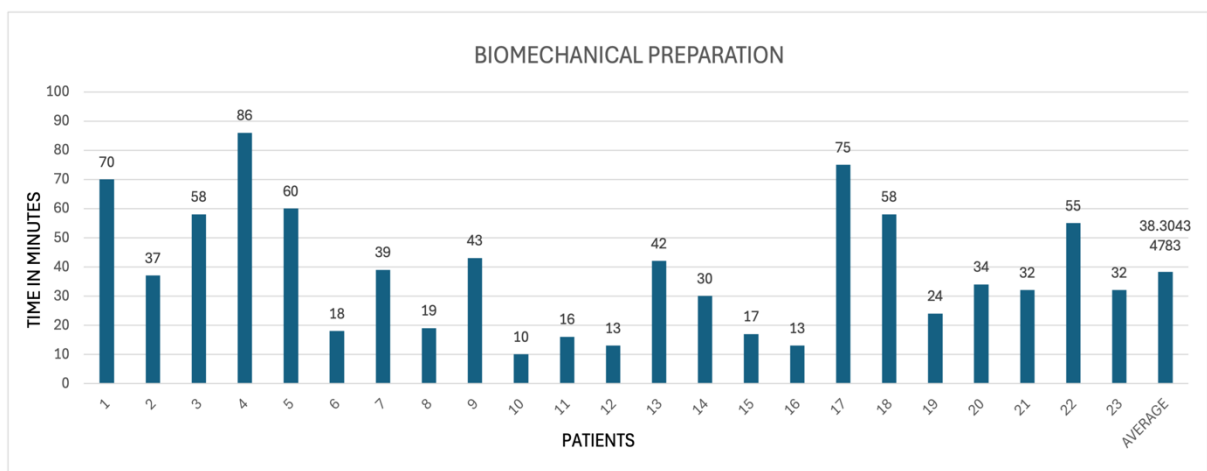


Interpretation: The average time taken to reduce the occlusal or incisal contacts was 7 minutes.

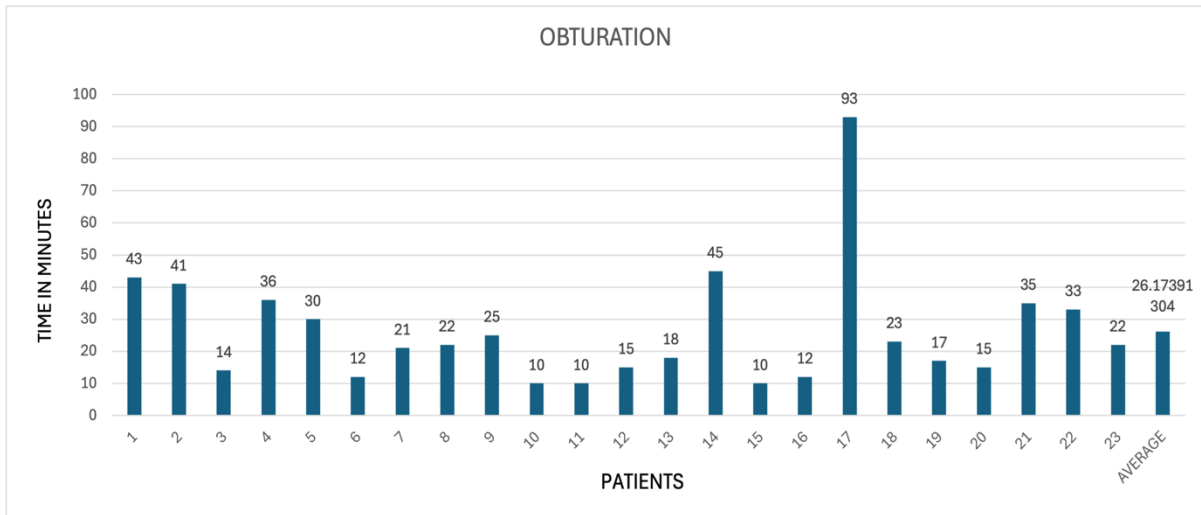
Reasons: OR is affected by patients' cooperation, pain, and non-carious diseases such as attrition.



Interpretation: The average time taken to open the canals in the tooth was 5 minutes.
Reasons: The AO depends on the tooth being treated, pain and accessibility and number of canals.

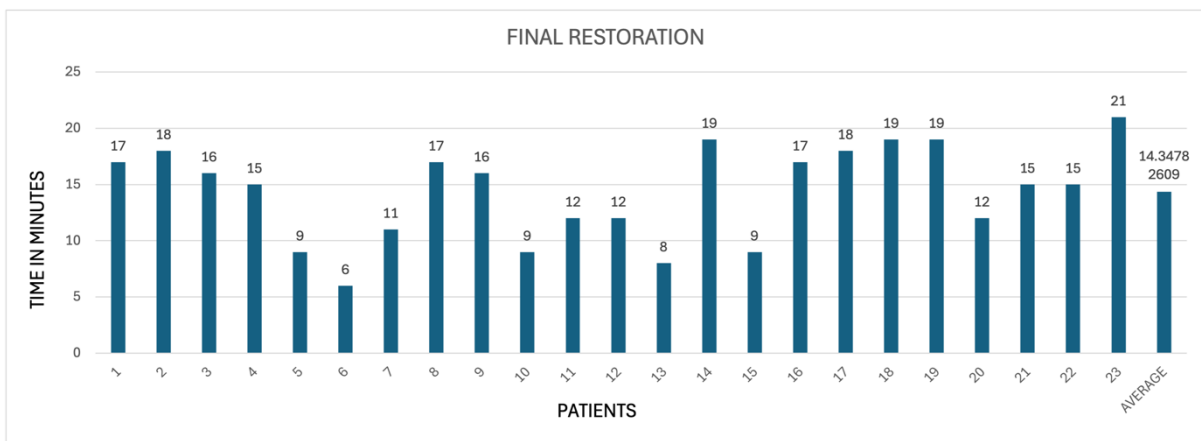


Interpretation: The average time taken for biomechanical preparation was 38 minutes.
Reasons: BMP is affected by the number of canals, accessibility, shape of canals, infection in the canals.



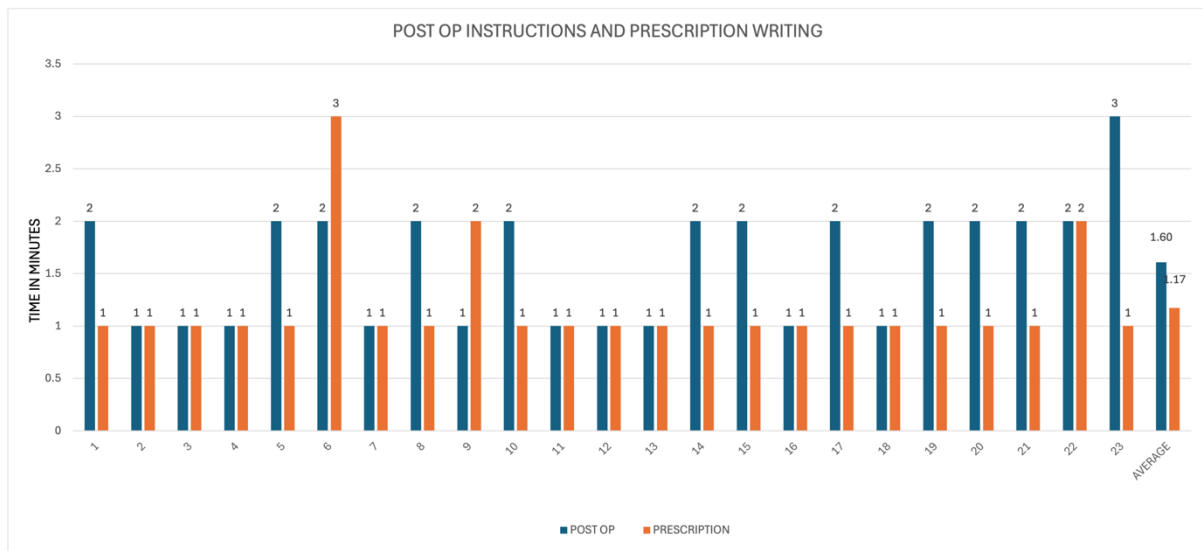
Interpretation: the average time for obturation was 26 minutes.

Reasons: the obturation is affected by the no. of canals, repetition of X- rays, and heating the instruments for sealing.



Interpretation: The average time taken for final restoration was 14 minutes.

Reasons: depends on the tooth size, the type of restorative material used, and isolation to prevent contact with the saliva.



Interpretation: the average time taken to write the prescription and give post operative instructions to patients was 1 minute and 2 minutes, respectively.

Reasons: the prescriptions were prepared by the doctors who were not attending the patients at that time and the post op instructions were given at every step as soon as it was completed.

SUGGESTIONS FOR OPTIMISING PROCEDURE EFFICIENCY.

- Make appointment scheduling simpler based on each case's complexity.
- To cut down on waiting times for patients and the number of times they miss appointments, use digital scheduling systems.
- Make use of loupes or dental microscopes to improve precision and visibility during procedures.
- Adopt four-handed dentistry techniques and provide staff training to improve efficiency and assistance.
- Inform patients about the significance of timely visits and follow-up appointments.
- Ensure continuous professional development through regular training and workshops for both staff and dentists on new materials, technologies, and techniques.
- Immediately replace equipment to avoid malfunctions.
- After a predetermined amount of time has passed, replace the files to prevent instrument breakage in the canal.

CONCLUSION

- One RCT typically takes between 90 and 3 hours to complete.
- The greater number, shape, and accessibility of canals make the posterior teeth take longer to clean than the anterior teeth.
- According to the study, RCT takes an average of 98 minutes to complete.
- But one of the cases took 4 hours to complete.
- The cause of the delay includes the severity of infection, pain, patients' cooperation, effectiveness of anaesthesia, and patients not coming on appointed days, doctors on leave, leading to cancellation of the appointment of the patients.
- Medical conditions such as diabetes, hypertension, patients taking blood thinners, Periapical abscesses, perforations, difficult access to posterior teeth, and patients' reduced mouth opening are additional potential causes of delay.
- The time taken to complete the RCTs also depends on the doctors' expertise and experience. Because it is crucial to manage the patient in the dental chair in addition to providing treatment, a newly practicing doctor would require more time than an experienced one.

DISCUSSION

This study demonstrates how different root canal treatments' (RCTs') durations might be in a normal dental office. Although some cases required up to 242 minutes, the average procedure duration for the 23 cases seen was 98 minutes, which is in line with the literature's range of

90 minutes to three hours. This demonstrates how the complexity of each case can have a big impact on how long a treatment takes.

The two processes that took the longest were obturation (26 minutes) and biomechanical preparation (38 minutes on average). These results are consistent with the knowledge that various elements, including operator skill, canal shape, and tooth anatomy, influence these operations.

Additionally, posterior teeth required more time than anterior teeth due to their intricate anatomy. Procedure times were also affected by patient cooperation, the efficiency of the anesthetic, and unforeseen complications. As a result, managing expectations and minimizing delays necessitate thorough preoperative assessments and patient education. The efficiency of trained support staff can be seen in the short amount of time required for minor tasks like patient preparation and instrument setup. The study recommends adopting four-handed dentistry, timely equipment upgrades, and regular staff training to enhance clinic productivity.

REFERENCES

- <https://www.aae.org/patients/root-canal-treatment/what-is-a-root-canal/>