

A SURVEY OF THE UNDERSTANDING ON ROOT CANAL DISINFECTION AMONG DENTAL STUDENTS IN KULLIYAH OF DENTISTRY, IIUM.



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Introduction

- Insufficient evidence in root canal disinfection contributes to differences in clinical practice.
- Previous surveys have been conducted on:
 - i. endodontists [1, 2]
 - ii. general dental practitioners [3]
- Lack on the undergraduate dental students.
- This study aimed to assess the understanding on root canal disinfection among IIUM dental students.





Introduction

- Successful root canal treatment depends on:
 - i. understanding of the root canal disinfection protocols [4]
 - ii. adequate grasp on the properties of irrigants [4]
- Therefore, it is important to comprehend the knowledge on root canal disinfection procedure so that the effective root canal treatment can be achieved.





Null hypothesis

Clinical experience among dental students has no influence on level of understanding on root canal disinfection.

Research question

Does clinical experience among dental students influence level of understanding on root canal disinfection?



General objective

To assess the understanding on root canal disinfection among clinical year dental students.

Specific objectives

1. To explore knowledge on the following aspects :
 - i. selection of root canal irrigant
 - ii. concentration of root canal irrigant
 - iii. removal of smear layer and
 - iv. the use of adjunct to root canal disinfection
2. To identify the relation between the number of root canal treatment (RCT) undertaken and the understanding on root canal disinfection.



Methodology

1. Study design

Cross sectional study (Survey).

2. Inclusion criteria

- Clinical year students (combination of year 4 and 5).
- Primary RCT.

3. Exclusion criteria

- Immature permanent teeth.
- Secondary RCT.


4. Definition of clinical experience

- The number of complete RCT undertaken.
- Incomplete RCT will be considered as 0 RCT.



5. Sampling method

- Non-probability sampling (convenience sample)
- Yamane sample calculation


$$n = \frac{N}{1 + N * (e)^2}$$

n - the sample size

N - the population size

e - the acceptable sampling error

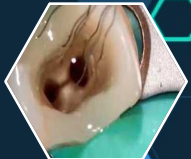
** 95% confidence level and p = 0.5 are assumed*

6. Survey tool

- A set of questionnaire consists of various aspects related to root canal disinfection.
- A pilot test of the questionnaire was done before conducting the actual survey and the results from the pilot test were not included in the actual survey.
- Slight changes were made on the questionnaire based on the feedback gathered from pilot test particularly the terminology.

7. Data analysis

- Chi square test by using SPSS version 16.0



Results

- Sample size calculation :
 - i. Based on Yamane calculation
 - ii. We need 91 subjects

$$n = \frac{117}{1+117(0.05)^2} = 90.5$$





Figure 1: Year of study

- 49% and 51% participants were fourth and fifth year dental students respectively.
- The majority of participants were female which was 75%.



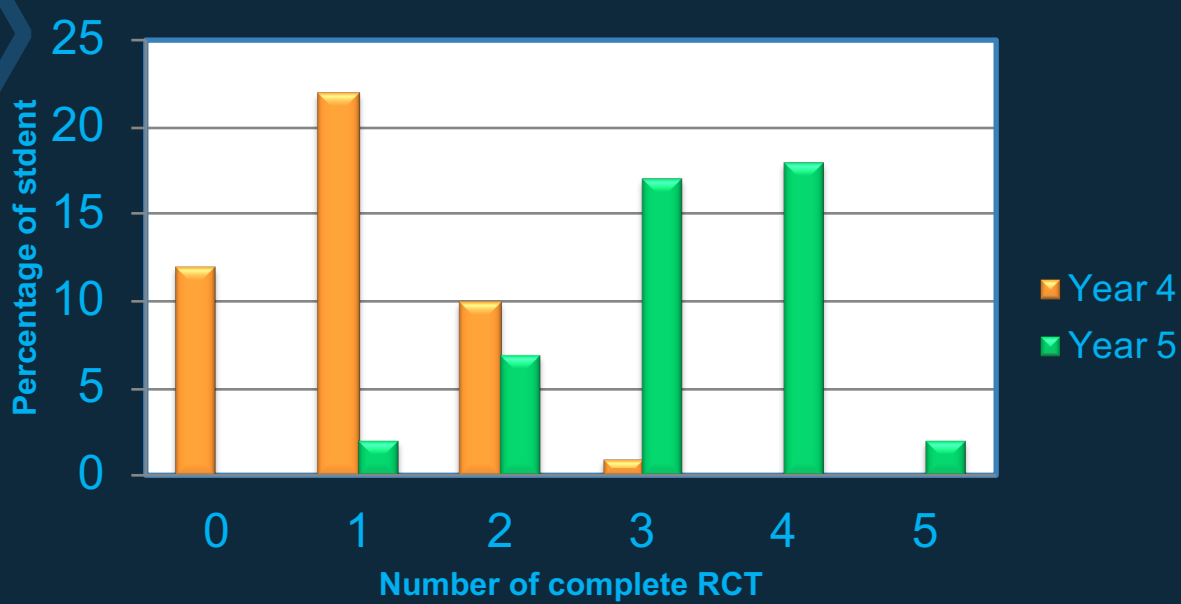


Figure 2: Number of complete RCT

- Fourth year dental students : completed 1 RCT, 12 participants had not completed any.
- Fifth year dental students : completed at least 1 RCT, the majority of them had completed 4 RCT.

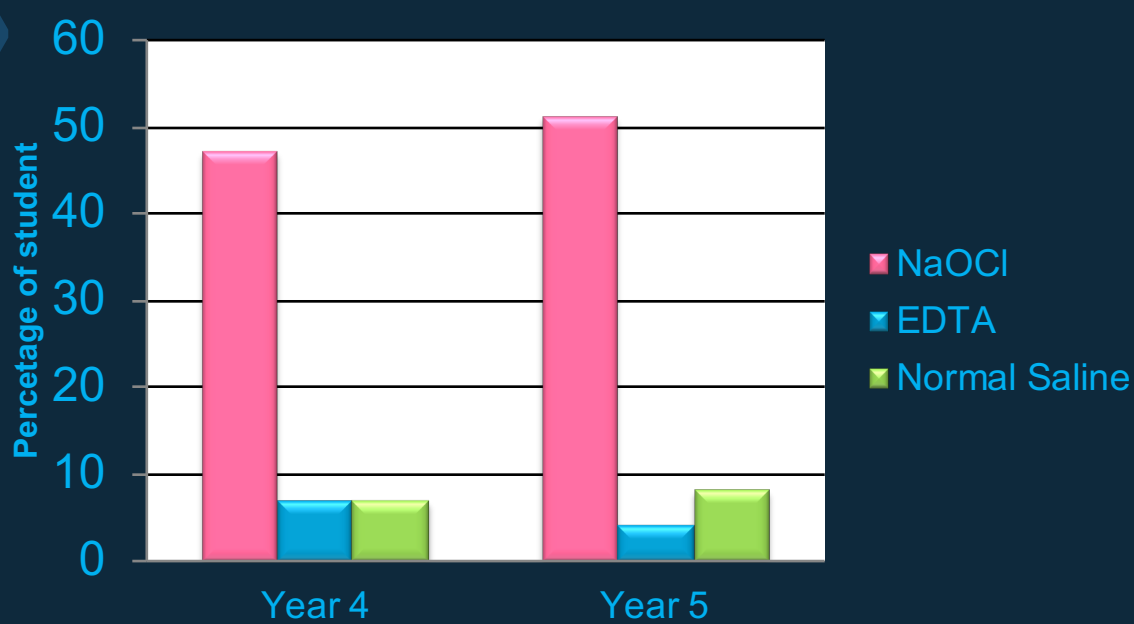


Figure 3: Root canal irrigants used in clinical practice of Year 4 and Year 5

- 89% of the participants used NaOCl.
- Some of them use normal saline.
- Approximately 2/3 of them has knowledge on other root canal irrigants and the rest knew only the most common one.

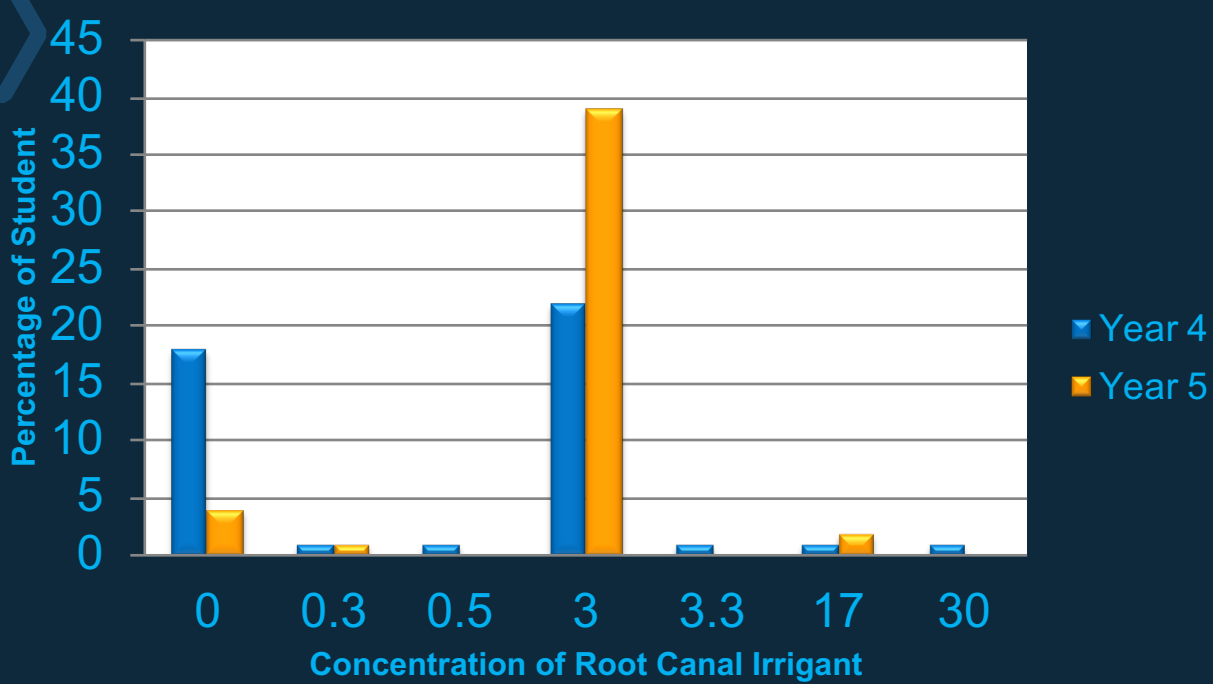


Figure 4: Concentration of root canal irrigants

- 67% of the participants knew the concentration of root canal irrigants and the rest had no idea about it.
- Most of fifth year dental students knew the concentration of root canal irrigants compared with fourth year.



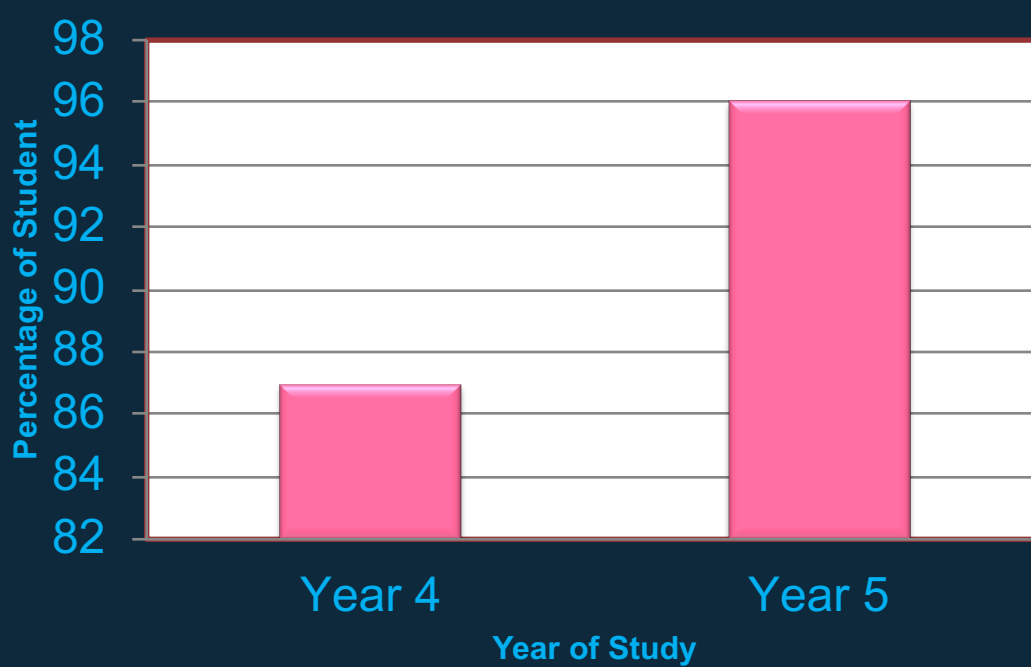


Figure 5: Removal of smear layer

- 83% of the participants removed smear layer.
- Most of fifth year dental students removed smear layer if compared with fourth year dental students.

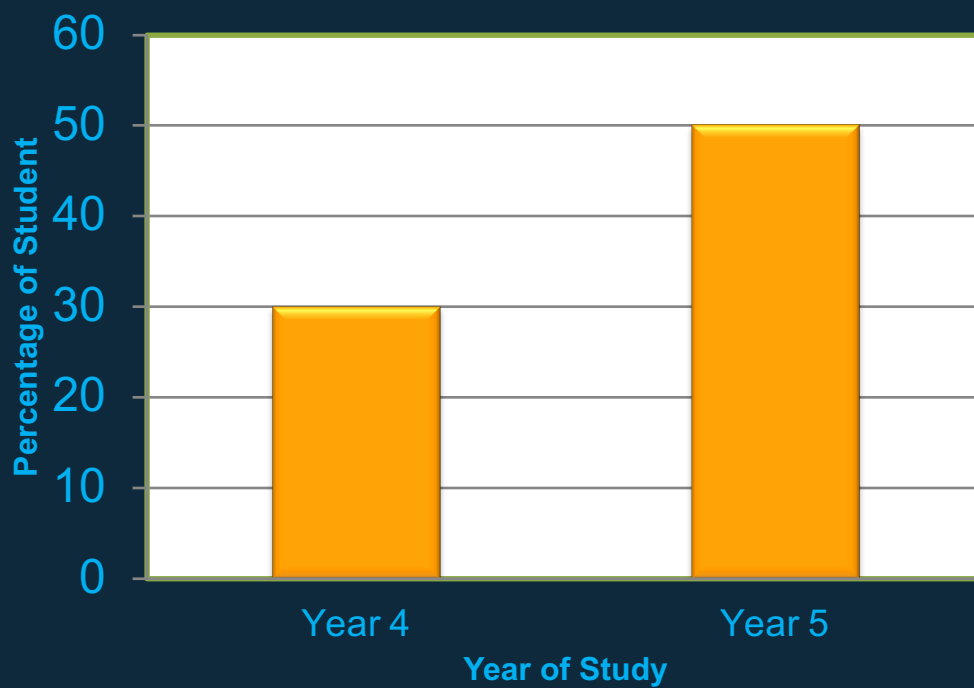


Figure 6: Agitation of root canal irrigant in clinic by Year 4 and Year 5 students.

- 42% of the participants used adjunct to root canal disinfection.
- Most of fifth year dental students practiced this method if compared with fourth year dental students.

Table 1: Result of p value of four aspects in root canal disinfection between fourth and fifth year dental students by using Chi square test.

Aspects in root canal disinfection	Dental students (knowledge, attitude and practice)				p value
	Fourth year		Fifth year		
	Yes	No	Yes	No	
Selection of root canal irrigant					
i. Normal saline	7%	93%	8%	92%	0.479
ii. EDTA	7%	93%	4%	96%	0.797
iii. NaOCl	47%	53%	51%	49%	0.148
Concentration of root canal irrigant	22%	78%	39%	61%	0.009
Removal of smear layer	87%	13%	96%	4%	0.001
The use of adjunct	30%	70%	50%	50%	0.039

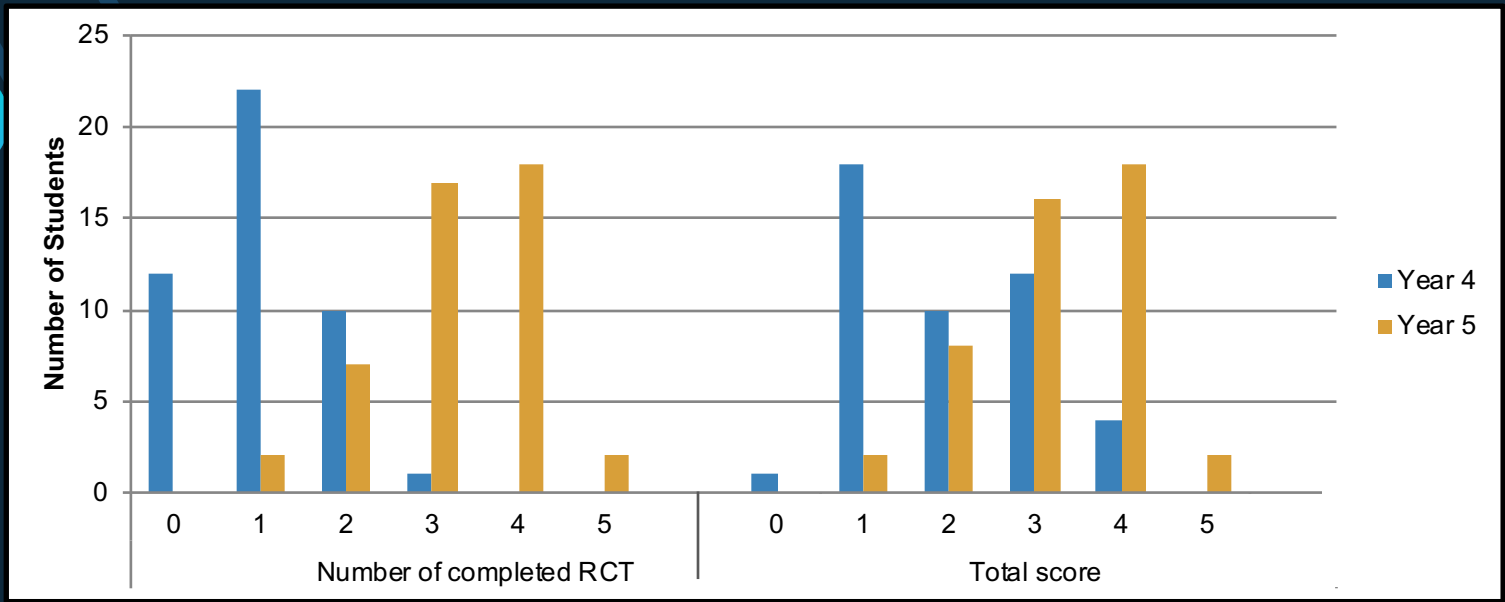


Figure 7: Relation between number of complete RCT and total score of the understanding on root canal disinfection.

- Fourth year : minimum score was zero, the maximum number of students scored 1.
- Fifth year : minimum score was 1, the maximum number of students scored 4.
- Most of fifth year students had a better understanding on root canal disinfection compared with fourth year dental students.

Table 2: Relation between total score of the understanding on root canal disinfection and the number of complete RCT as well as the year of study.

Criteria	P value
Relation between the total score of the understanding on root canal disinfection and the number of complete RCT	0.009
Relation between the total score of the understanding on root canal disinfection and year of study	0.000

- There were significant differences between the total score of the understanding on root canal disinfection and the number of complete RCT as well as the year of study.

Discussion

- The use of NaOCl as RCI:

- i. The results of this study showed that NaOCl was the main root canal irrigant in students practice even though some of them used nonantimicrobial root canal irrigant.
- ii. This corroborated with previous surveys that demonstrated the use of NaOCl as the root canal irrigant of choice [1, 2].

- The use of EDTA for removal of smear layer:

- i. Most students used EDTA as their irrigant of choice.
- ii. The use of NaOCl and EDTA was in agreement with other studies that stated NaOCl and EDTA as the effective root canal irrigants [5, 12, 19].



Discussion

- The frequency of removing smear layer:
 - i. The majority of students in this survey removed it.
 - ii. The result corresponded with previous studies on GDPs that the majority of them removed smear layer [1, 3, 21].
- Agitation of RCI:
 - i. Less than half of the participants practiced manual agitation of root canal irrigant by using gutta percha pumping technique as the adjunct of root canal disinfection procedure.
 - ii. Due to lack of awareness and limited evidence on the use of adjunct in root canal disinfection, it was less implemented by the students and this was in agreement with other studies [1, 2].





Conclusion

Within the limitation of this study, the conclusion that can be drawn was:

- Students who had more experience on RCT procedure had better understanding on root canal disinfection protocol.



Recommendation

- To come out with a guideline for root canal disinfection protocol in student clinic.



Acknowledgement



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References

1. De Gregorio C, Arias A, Navarrete N, Cisneros R, Cohenca N. Differences in disinfection protocols for root canal treatments between general dentists and endodontists: a Web-based survey. *The Journal of the American Dental Association*. 2015 Jul 31;146(7):536-43.
2. Dutner J, Mines P, Anderson A. Irrigation trends among American Association of Endodontists members: a web-based survey. *Journal of endodontics*. 2012 Jan 31;38(1):37-40.
3. Savani GM, Sabbah W, Sedgley CM, Whitten B. Current trends in endodontic treatment by general dental practitioners: report of a United States national survey. *Journal of endodontics*. 2014 May 31;40(5):618-24.
4. Paul J. Recent trends in irrigation in endodontics. *Int. J. Curr. Microbiol. App. Sci*. 2014;3(12):941-52.
5. Haapasalo M, Shen Y, Qian W, Gao Y. Irrigation in endodontics. *Dental Clinics of North America*. 2010 Apr 30;54(2):291-312.
6. Basrani B, Haapasalo M. Update on endodontic irrigating solutions. *Endodontic topics*. 2012 Sep 1;27(1):74-102.
7. Park E, Shen Y, Haapasalo M. Irrigation of the apical root canal. *Endodontic Topics*. 2012 Sep 1;27(1):54-73.
8. Haapasalo M, Shen Y, Wang Z, Gao Y. Irrigation in endodontics. *British dental journal*. 2014 Mar 21;216(6).
9. Plotino G, Cortese T, Grande NM, Leonardi DP, Di Giorgio G, Testarelli L, Gambarini G. New technologies to improve root canal disinfection. *Brazilian dental journal*. 2016 Feb;27(1):3-8.
10. Fedorowicz Z, Nasser M, Sequeira-Byron P, de Souza RF, Carter B, Heft M. Irrigants for non-surgical root canal treatment in mature permanent teeth. status and date: New, published in. 2012(9).
11. Eliyas S, Briggs PF, Porter RW. Antimicrobial irrigants in endodontic therapy: 1. Root canal disinfection. *Dental update*. 2010 Jul 2;37(6):390-7.
12. Torabinejad M, Handysides R, Khademi AA, Bakland LK. Clinical implications of the smear layer in endodontics: a review. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*. 2002 Dec 31;94(6):658-66.



References

13. Violich DR, Chandler NP. The smear layer in endodontics—a review. *International Endodontic Journal*. 2010 Jan 1;43(1):2-15.
14. Asnaashari M, Safavi N. Disinfection of contaminated canals by different laser wavelengths, while performing root canal therapy. *Journal of lasers in medical sciences*. 2013;4(1):8.
15. Koçani F, Kamberi B, Dragusha E, Mrasori S, Haliti F. The cleaning efficiency of the root canal after different instrumentation technique and irrigation protocol: A SEM analysis. *Open Journal of Stomatology*. 2012 Jun 12;2(02):69.
16. Gulabivala K, Ng YL, Gilbertson M and Eames I. The fluid mechanics of root canal irrigation. *Physiological Measurement* 2010; 31: R49-R84.
17. Stojicic S, Zivkovic S, Qian W, Zhang H, Haapasalo M. Tissue dissolution by sodium hypochlorite: effect of concentration, temperature, agitation, and surfactant. *Journal of endodontics*. 2010 Sep 30;36(9):1558-62.
18. Borse S, Sanap A, Mehta V, Borse N, Bhosale S, Oswal P. Effect of Different Irrigation Devices on Removal of Smear Layer-A Systematic Review. *Journal of Contemporary Medical Research*. 2017;4(6):1371-7.
19. Zehnder M. Root canal irrigants. *Journal of endodontics*. 2006 May 31;32(5):389-98.
20. Wang HH, Sanabria-Liviak D, Sleiman P, Dorn SO, Jaramillo DE. Smear layer and debris removal from dentinal tubules using different irrigation protocols: scanning electron microscopic evaluation, an in vitro study. *Evidence-Based Endodontics*. 2017 Dec 1;2(1):5.
21. Gopikrishna V, Pare S, Kumar AP, Narayanan LL. Irrigation protocol among endodontic faculty and post-graduate students in dental colleges of India: A survey. *Journal of conservative dentistry: JCD*. 2013 Sep;16(5):394.



Appendix

Ethical consideration

- Ethical approval from research ethical committee of International Islamic University Malaysia (IIUM) (IREC) was received on 28th February 2017 with ID Number IREC 724.



Appendix

A SURVEY OF UNDERSTANDING ON ROOT CANAL DISINFECTION AMONG DENTAL STUDENTS IN KULLIYAH OF DENTISTRY IUM

A. Demographic background

1. Year of study
 Year 4
 Year 5
2. Gender
 Male
 Female

B. Number of root canal undertaken

3. How many root canal treatment have you completed until obturation?

4. How many of them have not been completed?

C. Selection of root canal irrigant

6. Do you use root canal irrigant in root canal treatment procedure?
 Yes
 No
7. If yes, what type of root canal irrigant that you currently use in the clinic?

8. Do you know other root canal irrigants for root canal disinfection?
 Yes
 No
9. If yes, please state other root canal irrigants apart from the one(s) that you mentioned in no. [7]. You can write more than one.

D. Concentration of root canal irrigant

10. Do you know the concentration of root canal irrigant that is currently used in your practice?
 Yes
 No
11. If yes, please write the concentration.

E. Properties of root canal irrigant

12. Do you know the properties of root canal irrigant that you use in your practice?
 Yes
 No
13. If yes, what are the properties? You can select more than 1.
 Antimicrobial
 Tissue dissolution
 Smear layer removal

F. Removal of smear layer

14. Do you remove smear layer following the completion of root canal preparation?
 Yes
 No
15. If yes, what type of root canal irrigant do you use?

16. Do you know the concentration of root canal irrigant for removal of smear layer that is currently used in your practice?
 Yes
 No
17. If yes, please write the concentration.

18. How often do you remove smear layer in your practice?
 Never
 Sometimes
 Always

G. The use of adjunct to root canal disinfection (agitation of root canal irrigant)

19. Do you know about the agitation of root canal irrigant?
 Yes
 No
20. If yes, what type of agitation method that you know? You can write more than one.

21. Do you agitate root canal irrigant during root canal treatment procedure?
 Yes
 No
22. If yes, what type of agitation method that you utilise in the clinic?

23. How often do you agitate root canal irrigant in your practice?
 Never
 Sometimes
 Always

Personal Opinion (Optional)

What do you think of our Kulliyah need to do to improve the level of understanding regarding root canal disinfection?

H. Regarding root canal disinfection knowledge

24. How did you obtain the knowledge and information regarding root canal disinfection? You can select more than one.
- Text books
 Lectures
 Journals/Articles
 Seminars/Conferences
 Clinical Supervision

Figure 1 : Questionnaire