USAGE AND PERCEPTION OF INTRA-ORAL TOPICAL ANAESTHESIA AMONG DENTISTS IN NAIROBI

NGUGI JOHN GAKER

V28/1951/2010

BDS III

A Community Dentistry Project Report submitted to the School of Dental Science, University of Nairobi in partial fulfillment for the degree of Bachelor of Dental Surgery.

2013
DECLARATION

I NGUGI JOHN GAKERA a Level III Bachelor of Dental Surgery (BDS), UON hereby declare that this is my original work and has not been submitted elsewhere by any other person for research purpose or award of any degree.

Signature……………………………Date…………………………………..
APPROVAL

INTERNAL SUPERVISOR

Dr. B.N Mua BDS (nbi), MPH (nbi), MBA (St. Pauls)

Senior lecturer, Community Health Department, Periodontology and Community Dentistry. School of Dental Sciences. College of Health Sciences, UoN

Signature…………………………………………    Date……………………………………

EXTERNAL SUPERVISORS

Dr. M. Muasya BDS [nbi], MDS [nbi]

Consultant Paediatric Dental Specialist

Signature…………………………………………    Date……………………………………
ACKNOWLEDGEMENTS

I would like to thank the Almighty God for giving me the resolve to see this project to completion.

I would also like to thank my parents for their support and encouragement thus far in my academic journey.

I also want to deeply appreciate my two supervisors, Dr B.N Mua and Dr. M. Muasya for their priceless contributions and assistance throughout the study period.

I acknowledge also my classmates for the light moments that kept me going even when things got tough and last but definitely not least I wish thank all the dentists who took their time to participate in my study.
DEDICATION

To my fellow musketeers, Kamande J and Mukavale T, thanks for the memories.
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DEFINITION OF TERMS

Form- refers to the type of topical anaesthetic e.g. lidocaine, benzocaine, xylocaine

Delivery system- refers to the preparation or presentation of the topical anaesthetic e.g. gel, spray, rinse, patch

Application time- time lapse between applying topical anaesthesia and giving the local injection
ACRONYMS

BDS- Bachelor of Dental Surgery

EXCEL- Microsoft Excel

FIG- Figure

KNH- Kenyatta National Hospital

SPSS- Statistical Package for Social Sciences

UON- University of Nairobi
SUMMARY

**Background:** Pain management is a fundamental goal in the dental practice. Local anaesthesia injection is widely accepted as the gold standard of pain management during dental procedures, be that as it may, many patients are uncomfortable and are fearful of injections. Intra-oral topical anaesthesia offers a solution to this predicament, reducing injection pain as well as pain from several other dental procedures. It is therefore important for the dentist to be aware of the types and uses of intra-oral topical anaesthetics.

**Objective:** The main objective of the study was to assess perception, and usage of intra-oral topical anaesthesia among practicing dentists in Nairobi.

**Study population:** The study population constituted all practicing dentists in Nairobi CBD area and its surrounding neighbourhood.

**Study design:** The study was a descriptive cross sectional study.

**Study area:** The study was conducted in Nairobi CBD and its surrounding environment.

**Data collection:** Data was collected by means of a self-administered questionnaire.

**Data management:** The data once collected was analysed using SPSS (17.0) programme and presented in text, graphs and charts.
Results: A total of 44 participants took part in the study. 20(45.5%) of respondents said they always used topical anaesthesia, 23(52.3%) said they used topical anaesthesia sometimes and 1(2.3%) said they rarely used topical anaesthesia. None of the respondents said they had never used topical anaesthesia.

The most popular form of topical anaesthesia used were Benzocaine 21(47.7%), Lidocaine 22(50%), Xylocaine 8(16.3%), with (33)75% of respondents preferring gel form as the delivery system of choice. On the question of effectiveness of topical anaesthesia, 9(20.9%) of respondents considered topical anaesthesia Very effective, 22(51.2%) considered it effective12 (25.6%) considered it adequate,1 (2.3%) considered it ineffective.

The most popular uses of topical anaesthesia among the respondents were extraction of primary teeth, suture removal and scaling and root-planning, the procedures where topical anaesthesia was most under-utilized were orthodontic procedures and relieving of gag reflex.

Conclusion: Within limitations of the study the survey revealed that topical anaesthetic was not yet established as a standard pain management modality during dental procedures. The study also showed that use of intra-oral topical anaesthesia is varied but is under-utilized in some dental procedures. The study also revealed that benzocaine and lidocainewere the most popular forms of intra-oral topical anaesthesia used by dentists in Nairobi.

Recommendations: Dentists should be sensitized during their training and continuous development programmes towards using topical anaesthetics as a standard modality of pain management.
More detailed research on utilization as well as application techniques of intra-oral topical anaesthetic should be undertaken.
CHAPTER ONE: INTRODUCTION AND LITERATURE REVIEW

1.1 INTRODUCTION

Pain is one of the most common causes of dental fear. It leads to avoidance of treatment by dental patients, owing to the fact that past traumatic dental experiences create a ‘pain memory’ that is triggered whenever the patient contemplates seeking dental treatment as revealed by a study done at the university of Queensland in Australia\(^1\).

In much as local anaesthetic injections are effective in managing the ‘main pain’, that is to say pain during the procedure itself, indeed most patients will testify that, the sight and sensation of the injection is in itself a source of pain and dental anxiety\(^2\).

Patients often express concern about the discomfort experienced during injection. Although short lived, the pain of LA administration in some patients is severe enough for them to decline future surgery. In the same breath it also follows that there are certain dental procedures that illicit mild pain that doesn’t warrant the use of local anaesthetic injection, and therefore require a more subtle mode of pain management\(^3\).

Topical anaesthetics are one of the modes of reducing injection pain, they can also be used in a variety of other dental procedures that illicit pain of lower magnitude such as suture removal, extraction of mobile primary teeth and rubber dam\(^4\)\(^-\)\(^6\).

There are varying forms of topical anaesthetic both in terms of pharmacological constituent and physical form each with its own pros and cons. Their mode of action is similar to that of injectable local anaesthetic and entails penetrating the mucosa or disrupted skin to a depth of
about 2-3mm, binding to the sodium gated ion channels of C nerve fibres thereby inhibiting nerve depolarization and blocking the transmission of pain sensation to the brain$^7$-$^8$.

Some of the types of topical anaesthesia in the market currently include:

I. Benzocaine Hydrochloride 14-20%
II. Lidocaine Hydrochloride 5%
III. Xylocaine Hydrochloride gel 5%
IV. Tetracaine Hydrochloride 14-20%
V. Eutectic Mixture of Local Anesthetic (EMLA- Prilocaine and lidocaine mixture)
VI. Dyclonine hydrochloride

These come in various forms including: patches, ointment/gel rinses, non-injectable syringes (Oraqix), sprays as well as in different flavours including mint, bubble gum, and fruit$^5$.

There is need to understand the use of topical anaesthetic from a dentist’s point of view in order to give proper guidelines on the use of topical anaesthetic in day to day dental procedures to the benefit of both the patient and the dentist.
1.2 LITERATURE REVIEW

1.2.1 Fear associated with dental injections

Local anaesthetic injection is one of the main causes of dental phobia\textsuperscript{1}, a study carried out in the University of Washington USA revealed that more than 25\% of adults surveyed expressed at least one clinically significant fear of injections. Almost one in 20 respondents indicated avoiding, cancelling or not appearing for dental appointments because of fear of dental injections\textsuperscript{2}. The situation becomes worse when patients have had a past dental experience with injections leading to anxiety, a study carried out in the university of Queensland in Australia on dental phobia revealed that the highly anxious patients expected more pain than they actually experienced during the procedure, and also required more time for chairside management than did patients with low levels of anxiety\textsuperscript{1}.

There is therefore need to reduce if not eliminate injection pain as a way of abating patients’ dental phobia, so that the dentist is able to be more effective in his procedure.
1.2.2 Efficacy of topical anaesthetic

The efficacy of topical anaesthetic, despite the view of some dentists, is well proven. Comparative studies have also been carried out on the various types of topical anaesthetics, a study done in Australia at the University of Melbourne on paediatric patients found a significant drop in the Visual Analogue Pain Scale in those patients who had 20% benzocaine applied as compared to those who received placebo of Vaseline gel before receiving the injection\(^9\). Many comparative studies between different topical anaesthetics have also been carried out, one such study compared efficacy of 20% benzocaine to a topical mixture of tetracaine, lidocaine and phenyl-epinephrine in placing a temporary orthodontic appliance and found the mixture to be more efficacious\(^{10}\).

Another comparative study done in India between two topical anaesthetics concluded that Lignocaine hydrochloride 5% was more efficacious as compared to 5% Bupivacaine Hydrochloride gel in extraction of teeth with grade 2 and grade 3 mobility\(^{11}\).

Apart from the type of anaesthetic itself, efficacy is also reliant on application time and the gauge of the needle used, a study done in the university of Toronto in Canada revealed that, increasing time of application did not necessarily result in a significant anaesthetic in effect for either needle insertion only or needle insertion plus injection of local anaesthetic. It did however conclude that application time of less than two minutes did not achieve adequate anaesthesia\(^{12}\).
1.2.3 Uses of topical anaesthetic

The most common use of topical anaesthetic is for pre-local injection soft tissue conditioning, but if applied with the right technique, it has a wide array of other uses. A study done in the United Kingdom through manual and electronic literature review revealed that the use of topical anaesthetics does not guarantee pain-free dental local anaesthesia, however evidence is available that the use of topical anaesthesia alone is sufficient to perform some intra-oral procedures including periodontal manipulations, operative dentistry and oral surgery\textsuperscript{3}.

These uses include: suture removal, scaling and root planning, dry socket dressing, laser-contouring of excess soft-tissue in orthodontics, placement of dental mini-implants, insertion of certain orthodontic appliances, extraction of teeth with grade 2 or grade 3 mobility, relieving teething pain in infants, relieving denture pain especially for new wearers, relieving pain from canker sores, relieving gag-reflex during impression taking\textsuperscript{5-6}. 
1.2.4 Dentists’ perception towards topical anaesthetic

While the use of local anaesthetic injection is routine in any dental practice, the use of topical anaesthetic does not follow suit. The question of to use or not to use topical anaesthetic is a subjective matter. Most dentists as indicated by a study done in the USA will only use topical anaesthetic for paediatric patients, others will use it for very anxious patients as more of psychological form of pain management while a certain percentage do not use it at all based on the fact that they do not believe in its efficacy\textsuperscript{14}.

Different dentists also use different types of topical anaesthetic depending on the efficacy and cost, a study in the USA revealed hurricane topical gel (20% benzocaine) was the most popular brand used by 41\% of dentist followed by Topicale (benzocaine) used by 15\% of dentists, lidocaine ointment gel was used by 12\% while Xylocaine was used by 3\% of the respondents\textsuperscript{14}.

There are also various application techniques utilized by different dentists in administering topical anaesthetic including, direct application with a cotton pellet on the mucosa, spraying, anaesthetic rinse, lidocaine patches and the most recent being by use of non-injectable syringes (Oraqix)\textsuperscript{15}.

With all these variants, it’s no wonder that different dentist offer varying opinions in the use of topical anaesthetic. Currently there is no study carried out locally on intra-oral topical anaesthetics. The present study was therefore aimed at establishing the perception and use of intra-oral topical anaesthetics among dentists locally. The study thereafter has made recommendations on how to enhance the use of topical anaesthesia as a form of non-invasive pain management locally.
CHAPTER TWO: STATEMENT OF RESEARCH PROBLEM AND OBJECTIVES

2.1 Statement of research problem

Pain management should be a primary concern for any good dentist. Efficient pain management lowers patient anxiety and motivates the patient to seek future treatment, more so for pediatric patients whose future attitude towards the practice is moulded by their childhood experience on the dental chair. Achieving pain free dentistry is easier said than done, but the use of topical anaesthetic is a step in the right direction.

There wasn’t any previous study that neither assessed the perceptions nor use of dental topical anaesthetic among practicing dentists in Kenya, it was the aim of this study to do so by investigating the views, preferences and use of topical anaesthetic among dentists in Nairobi.

2.2 Justification of the study

The study was aimed at collecting data from practicing dentists in Nairobi on the attitude, preference and uses of topical anaesthetic. The literature showed that dentists had varying opinions on the efficacy of topical anaesthetic; the study brought to light these views from the practitioner’s perspective and thereafter made recommendations on how to enhance the use of topical anaesthetic as mode of pain management with the primary goal being achieving pain free dentistry.
2.3 Objectives

Main objective:
The main aim of the study was to assess perception, form preference and usage of intra-oral topical anaesthesia among practicing dentists in Nairobi.

Specific objectives

The following were the specific objectives of the study:

1. To determine the attitude of Nairobi dentists towards the use of topical anaesthetic.
2. To establish the criteria used by dentists in Nairobi in selecting which patients to use topical anaesthetic on.
3. To determine the dental procedures where topical anaesthetic is applied among dentists in Nairobi.
4. To determine the form of intra-oral topical anaesthetic used by most dentists in Nairobi.
CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Study area

The study was conducted in various private and public dental practices in Nairobi CBD and surrounding environs. Nairobi is the capital city of Kenya, with a population of over 3 million inhabitants, it harbours most of the medical institutions and healthcare facilities and it therefore follows that it has the majority of dentists in the country. According to a recent survey there are about 700 dentists in Kenya, of which 80% live in urban areas, of this over 50% practice in Nairobi. Nairobi is therefore a good representation of the country’s dental fraternity at large.\textsuperscript{17-19} The study area also included the University of Nairobi Dental Hospital which is the main referral for patients with oral and maxillofacial conditions in Kenya, situated along Ralph buche road, this institution is privileged to have dentists of various calibres in all disciplines of dentistry making it a rich source of analytical data.

Another institution to note in the study area was the Kenyatta National Hospital Dental department, owing to the fact it serves a tremendous number of patients it was also be a good source of data.

3.2 Study population

The study population comprised of all qualified dentist, in either private or public practice within the Nairobi CBD and its neighbourhood.

3.3 Study design

The study was a descriptive cross-sectional study.
3.4 Variables

3.4.1 Socio-demographic variables

1. Gender

2. Years of practice

3.4.2 Independent variables

I. Frequency of use of intra-oral topical anaesthetic

II. Criteria used for patient selection when using topical anaesthetic

III. Time lapse between applying the topical anaesthetic and giving the injection

IV. Percentage of patients who have heard adverse drug reaction as a result of intra-oral topical anaesthetic

3.4.3 Dependent variables

I. Form of intra-oral topical anaesthetic used

II. Delivery system of intra-oral topical anaesthetic used

III. Success rate of topical anaesthetic in pain management prior to giving local injection
3.5 DATA

3.5.1 Data collection tools

The data collection tool was a self-administered questionnaire.

3.5.2 Data analysis presentation

The data collected was entered into a computer and analysed using SPSS 17.0 and MS EXCEL, and then presented in text, bar-graphs and charts.

3.5.3 Inclusion and exclusion criteria

3.5.3.1.1 Inclusion Criteria

1. Any qualified dentist practicing within Nairobi area

2. Dentist who agree to participate in the study.

3.5.3.1.2 Exclusion Criteria

1. Dentists practicing outside Nairobi area

2. Dentists who don’t agree to participate in the study

3.6 Ethical considerations

Approval was sought from the Kenyatta National Hospital/University of Nairobi Research Ethics and Standards Committee.

Permission was also sought from the respective study subjects and a consent form explaining the purposes and intent of the study issued for their signing.

Any information availed by the study subjects was confidential and used solely for purposes of the study.
3.7 Sampling

3.7.1 Sampling unit

A duly qualified dentist practicing within Nairobi CBD and its neighbourhood

3.7.2 Sampling method

Random sampling method was employed to select the dentists to participate in the study.

3.7.3 Sample size determination

A prevalence of 50% was used in the study.

The sample size was calculated using the following formula:

\[ n = \frac{Z^2 P(1 - P)}{C^2} \]

Where:

\( n \) = Study population

\( Z \) value = 1.96

\( P \) = Prevalence 50% (0.50)

\( C \) = Confidence level 95% (0.95)

\[ n = \frac{1.96^2 \times 0.50(1 - 0.50)}{(1 - 0.95)^2} \]

\( n = 384 \)
If $N$ is less than 10,000 then

$$nf = \frac{n}{1 + \left(\frac{n}{N}\right)}$$

Where:

$nf = \text{the desired population size}$

$n = 384$

$N = \text{the estimate population size which is 50 dentists in the study area}^{17-18}$. 

$$nf = \frac{384}{1 + \left(\frac{384}{50}\right)}$$

$nf = 44$
3.8 Perceived benefits

The results from the study would sensitize dentists on the use of intra-oral topical anaesthetic as a standard procedure for pain management during dental treatment. The acquired data would also reveal the various ways which topical anaesthesia can be utilized in the performing dental procedures.

The study would also be submitted in partial fulfilment of the Bachelor of Dental Surgery course at the University of Nairobi.

3.9 Limitations of the study

Some of the participants may not have answered the questions honestly. Others either did not return the questionnaire or declined to participate in the survey all together.
CHAPTER FOUR: RESULTS

4.1 Socio-demographic characteristics

A total of 44 dentists were included in the study. Of these 28(62.8%) were male while 16(37.2%) were females. In terms of years of dental practice, those with experience of up to 5 years were 14(32.6%), those with experience of 6 to 10 years were 12 (27.9%), those with experience of 11 to 20 years were 10 (23.3%), 21 to 30 years were 6(14.0%), and only 1 (2.3%) participant had above 30 years of experience. (Fig 1)
4.2 Attitude of intra-oral topical anaesthesia among dentists in Nairobi

On the question on how often the dentists used the intra-oral topical anaesthesia, 20 (45.5%) of respondents said they always used topical anaesthesia, 23 (52.3%) said they used topical anaesthesia sometimes and 1 (2.3%) said they rarely used topical anaesthesia. None of the respondents said they had never use topical anaesthesia. (Fig 2)

![Pie chart showing frequency of topical anaesthesia use among respondents]

**Figure 2: Percentage of Frequency of use among respondents**
Application time

On application time before giving the injection, 20 (44.2%) of respondents applied the topical for 30 seconds to 1 minute, 17 (39.5%) applied it for 1 minute to 2 minutes, while 7 (16.3%) applied for more than 2 minutes.

Effectiveness of topical anaesthesia

On the question of effectiveness, 9 (20.9%) of respondents considered topical anaesthesia very effective, 22 (51.2%) considered it effective, 12 (25.6%) considered it adequate, 1 (2.3%) considered it ineffective. (Fig 3)

![Effectiveness of Topical Anaesthesia](image)

**Figure 3: Percentages of effectiveness of topical anaesthesia as given by respondents**

Patient dislike of topical anaesthesia
On the question of why their patients disliked intra-oral topical anaesthetic, 22(50%) reported taste as the reason for the dislike, 2(4.5%) attributed the dislike to consistency, another 1(2.3%) attributed it to smell. 16(36.4%) of the respondents said their patients don’t dislike topical anaesthesia. 3(6.9%) respondents gave other reasons given for patient dislike were, mucosal irritation, burning sensation, and throat discomfort if the anaesthesia is swallowed.

**Adverse reaction to topical anaesthesia**

Only 1(2.3%) of respondents reported an adverse reaction to the topical anaesthesia in the last one year.

**Percentage of the time topical anaesthesia is effective**

On how often they thought topical anaesthesia worked, 2(4.5%) of respondents reported topical anaesthesia worked 25% of the time, 11(25.0%) reported it worked 50% of the time, 23(52.3%) reported it worked 75% of the time, while 7(15.9%) reported it worked 100% of the time. (Fig 4)

![Figure 4: Percentage of times respondents thought topical anaesthesia was effective](image-url)
4.3 Criteria for selecting patients to use topical anaesthetic

On which patients dentists use topical anaesthesia on, 19(43.2%) said they use it in all patients, 14(31.8%) used in paediatric patients, 13(29.5%) used in anxious patients, while 8 (18.2%) said they used topical anaesthetic upon patient request. (Fig 5)

![Criteria for Patient Selection](image)

**Figure 5: Percentage of criteria used for patient selection among respondents**
4.4 Form preference of intra-oral topical anaesthesia

The most popular forms of topical anaesthesia used were Benzocaine 21(47.7%) and Lidocaine 22(50%). Those who preferred Xylocaine were 8(16.3%). None of the respondents used other. (Fig 6)

Preferred delivery system

The preferred delivery system for topical anesthetic was gel/ointment form in 33(75%) of respondents, 11(27.3%) preferred sprays while 1(2.3%) preferred patches. None of the respondents preferred oral rinses or non-injectable syringes as delivery systems. (Fig 7)

17(38.6%) of respondents gave better analgesic effect as the main reason for their preferred delivery system, 2(4.5%) gave patient preference, 8(18.2%) gave cost and availability while 6(13.6%) had no specific reason for preferring one delivery system over the other. Of the respondents that opted for gels and ointment delivery 9(12%) said they preferred it due to target delivery and better control of the anaesthetic, 2(4.6%) owed the preference to ease of application, while 1(2.3%) found sprays to be irritating.

30(68.8%) of respondents said they would consider using an alternative delivery system if available in the market while 6(13.6%) said they would not, 8(18.2) said they were undecided.
Figure 6: Percentage of preferred form of topical anaesthesia among respondents

Figure 7: Percentage of Preferred preparation of topical anaesthesia among respondents
4.4 Usage of intra-oral topical anaesthesia

On other uses of intra-oral topical anaesthetics apart from conditioning tissues before injections, the survey produced the following results in descending order.

25 (56.8%) used it in extraction of mobile primary teeth including loose root spicules embedded in the mucosa, 18(40.9%) scaling and root planning, 16(36.4%) reported using topical anaesthesia for suture removal, 13 (29.5%) used it in relieving apthae (canker sores) pain, 11(25%) used it in relieving pain for new denture wearers, 5(11.9%) used it in extraction of mobile secondary teeth, 4(9.1%) use it for dry-socket dressing, 2(4.7%) use it for orthodontic procedures, which included molar band placement and relieving arch-wires embedded in the mucosa, 1(2.3%) used it in relieving gag reflex.(Fig 8)
Figure 8: Percentage Use of Topical Anaesthesia
CHAPTER FIVE: DISCUSSION OF RESULTS, CONCLUSION AND RECOMMENDATIONS

5.1 DISCUSSION

The response rate for the research was 44(100%) which was excellent. The gender and age of the study subjects were chosen randomly, 28(62.8%) of the respondents were male while 16(37.2%) were females. Of these those with upto 5 years were 14 (32.6%), those with experience of 6 to 10 years were 12 (27.9%), those with experience of 11 to 20 years were 10 (23.3%), 21 to 30 years were 6 (14.0%), and only 1 (2.3%) participant had above 30 years of experience which gave a fair representation of the various generation of dentists. The study was aimed at assessing the usage and perception of intra-oral topical anaesthetic among dentists in Nairobi and based on the findings formulate strategies to encourage the use of topical anaesthetic as a mode of non-invasive pain management.

From the results, only 20 (45.5%) of dentists reported using topical anaesthesia always with a majority 23(52.3%) saying they only used it sometimes. In terms of patient selection criteria only 19(42.3%) said they used topical anaesthesia on all their patients, 14(32.6%) used it on paediatric patients, 13(30.6%) used it on anxious patients and 8(18.9%) used it upon patient request. These results differed in comparison to those got from a similar study done by Kohli et al where 89% of respondents reported using topical anaesthetic always. This revealed that the use of topical anaesthetic is not standard procedure for majority of the dentists in Nairobi as should be the case.
The preferred form of topical anaesthetic among dentists were found to be benzocaine and lidocaine, with 33(75%) of respondents preferring gel/ointment form as the preferred preparation. Some of the reasons given for preferring gel were: better analgesic effect, ease of application, good control of anaesthetic in the required area and target delivery.

These results were similar to those got by Kohli et al in Canada where the preferred form of topical anaesthetic was benzocaine gel used by 41% of respondents. The study also found that 30(68.8%) of dentists were willing to try an alternative delivery system if available in the market. Several new alternatives have been developed in the United States including non-injectable syringes (Oraqix) a gel mixture of prilocaine and lidocaine which is dispensed into deep periodontal pockets during scaling and root planning procedures. Another recent development is that of EMLA (Eutectic mixture of Local Anaesthetics) which is a mixture of Lidocaine and Prilocaine, studies have proven it to be more efficacious than Benzocaine. Unfortunately though, these formulations were yet to be introduced into the Kenyan Market at the time of the study.

As for the percentage of times dentists thought topical anaesthesia was effective, majority of respondents 23(52.3%) reported that topical anaesthesia was effective 75% of the time which was similar to the results of a study done by Kohli et al in the USA that found majority of respondents thought topical anaesthesia was effective 75% of the time.

Only 1(2.3%) of the respondents reported an adverse drug reaction to topical anaesthesia in the past one year, this results are consistent with a study done in Canada by Kohli et al which found very low incidence of adverse reactions related to topical anaesthesia.
22(50%) of respondents reported taste as the primary reason why patients disliked topical anaesthesia. Other reasons included mucosal irritation, burning sensation, and throat discomfort if the anaesthetic was swallowed accidentally in a small number of respondents. A survey by the University of Columbia on uses of Topical listed methmoglobinemia as the major but rare adverse drug reaction that can be caused by topical anaesthesia and it was more likely to occur due to swallowing of excess topical anaesthesia. This finding draws caution in using excess amounts of topical anaesthesia amongst elderly patients and very young children\(^5\).

In the study majority (20)44.2%, applied topical anaesthetic for 30 seconds to 1 minute, while only 7(16.3%) applied it for more than 2 minutes as recommended by a study done by Haas et al on effect of time on the clinical efficacy of topical anesthetic\(^13\). This could have been one of the major contributing factors as to why there was varied opinion on the clinical effectiveness of topical anaesthesia among the dentists.

Usage of intra-oral topical anaesthetic for other purposes other than prior to giving local anaesthetic injections was varied. The procedures where topical anaesthetic was most utilized were to be extraction of mobile primary teeth by 25(56.8%) of respondent, scaling and root planning by 18(40.9)% of respondents, and suture removal by 16(36.4%) of respondents. The procedures where use of topical anaesthesia was greatly under-utilized were dry-socket dressing, orthodontic procedures and relieving of gag reflex. Other uses revealed by the survey included relieving pain for new denture wearers, and relieving pain from canker/apthae sores. These uses were similar to those obtained from a research carried out by di Tolla in the USA on creative uses of topical anesthetics\(^10\).
Use of topical anaesthesia for extractions of mobile teeth specifically those of Grade 3 mobility was found to be efficacious for both 5% Bupivacaine and 5% lidocaine gels as demonstrated by a study done in India comparing two forms of topical anesthetic. This evidence was supported by the current survey where the majority of respondents said they used topical anaesthesia for extraction of mobile primary teeth.

Other uses in minority of respondents included Orthodontic procedures by 2(4.7%) of respondents, specifically placing of molar bands and relieving of orthodontic wires lodged in the mucosa. A study done by Derek S. et al in the USA concluded that topical anaesthetic was sufficiently adequate for many orthodontic procedures that involved impinging on the mucosa. Therefore the current study demonstrates that use of topical anaesthesia in orthodontics is grossly diminished among dentists in Nairobi.

Scaling and root-planning was one of the procedures where use of topical anaesthesia was popular. A research carried out by Di tolla in the USA found that a widely used Oral rinse (DYC) was effective in reducing tooth sensitivity experienced during prophy, scaling and root planning. Another formulation Oraqix was found to be efficacious in pain management and enhancing patient comfort during scaling and root planning in deep pockets and is currently widely used in the USA.

Only 1(2.3%) of respondents reported using topical anaesthetic to relieve gag reflex. A survey done at the university of Columbia listed relieving of gag reflex during x-ray taking and impression taking, as one of the major uses of topical anesthetic. The results in the current survey however revealed that topical anaesthesia was grossly underused for this procedure.
5.2 CONCLUSION

Within limitations, of the study the survey revealed that topical anaesthesia was not yet established as a standard pain management modality during dental procedures. The study also showed that use of intra-oral topical anaesthesia was varied and was under-utilized in some dental procedures. The study also revealed that benzocaine and lidocaine were the most popular forms of intra-oral topical anaesthesia used by dentists in Nairobi.
5.3 RECOMMENDATIONS

Based on the findings of this study, the following were the recommendations;

Dentists should be sensitized during their training and continuous development programmes towards using topical anaesthetics as a standard modality of pain management.

Dentists should be made aware of the various forms and delivery systems of intra-oral topical anaesthetic available in the market.

More detailed research on utilization as well as application techniques of intra-oral topical anaesthesia should be undertaken.
REFERENCES


APPENDIX I: CONSENT FORM

I am Ngugi John Gakera a level III Bachelor of Dental Surgery (BDS) student at the University of Nairobi. I am currently conducting a research to find out the knowledge preference and use of intra-oral topical anaesthetics among dentists in Nairobi County.

I wish to request for your participation in this study that would form part of my degree course. It involves filling out a questionnaire.

Any information given will be used strictly for the purposes of my research project. Participation is voluntary and utmost confidentiality is assured.

The results and recommendations made from the study will be beneficial to both clinicians and patients in as far as non-invasive pain management is concerned.

Your participation in this study will be highly appreciated.

I………………………………………………………………………………………………………………………………… Do hereby give consent for………………………………………………………………………………………………………………

to participate in this study.

Sign…………………………………. Date……………………………………
APPENDIX II: QUESTIONNAIRE

USAGE AND PERCEPTION OF INTRA-ORAL TOPICAL ANAESTHESIA AMONG DENTISTS IN NAIROBI

QUESTIONNAIRE

This questionnaire is a constituent of the community dentistry project. The participation in this study is voluntary and any information that you provide will remain solely confidential and used only for purposes of the research project.

Answer the questionnaire by TICKING your response and by filling APPROPRIATELY the spaces where applicable.

1. What is your gender?
   - Male
   - Female

2. Years in dental practice?
   - 0-5
   - > 5 to 10 years
   - >10 to 20 years
   - >20 to 30 years
e) >30

3. Do you use any topical anesthetic gel, spray, etc
   a) always
   b) sometimes
   c) rarely
   d) never
4. What form of topical anesthetic do you use?
   a) Hurricaine (Benzocaine)
   b) Lidocaine Gel/Ointment
   c) Xylocaine
   d) Other (Please Specify in the box below)

5. What criteria do you use to select which patient will need intra-oral topical anesthetic?
   a) I use in all patients
   b) I use only in Pediatric Patients
   c) Upon Patient request
   d) Anxious/ fearful patients

6. Which delivery system do you prefer for intra-oral topical anesthetic?
   a) Spray
   b) Gel/ Ointment
   c) Patches
   d) Oral rinse
   e) Non-injectable syringes
7. What is your reason for the response in (6) above?
   a) Better analgesic effect
   b) Patient preference
   c) Availability/ Cost
   d) No specific reason
   e) Other (please specify in the box below)

8. Would you consider using a different delivery system of topical anesthetic preparation if available in the market?
   a) Yes
   b) No
   c) Undecided

9. How long do you wait after applying a topical anesthetic before you inject?
   a) less than 30secs
   b) 30seconds to 1minute
   c) >1 minute to 2 minutes
   d) More than 2 minutes
10. Do you think topical anesthetics are effective when applied prior to the local anesthesia injection?
   a) Very effective
   b) Effective
   c) Adequate
   d) Poor
   e) Ineffective

11. What do your patients dislike most about the topical anesthetic available in the market today?
   a) Taste
   b) Consistency
   c) Color
   d) Smell
   e) Other please specify below
   f) They do not dislike

12. How many of your patients experienced any adverse drug reaction to the topical anesthetic preparation in the last year?
   a) none
b) 1 to 5

c) >5 to 15

d) >15

13. In your experience, approximately what percentage of the times do topical anesthetics work when applied prior to the local anesthetic injection?

   a) 0%

   b) 25%

   c) 50%

   d) 75%

   e) 100%
14. Apart from prior to giving injections, which other dental procedure(s) do you use Intra-oral topical anaesthetic?

- suture removal
- scaling and root planning
- dry socket dressing
- Orthodontic Procedures (Please Specify in the box below)

- Extraction of mobile primary teeth
- Extraction of mobile permanent teeth
- Relieving pain for new denture wearers
- Relieving pain from canker sores
- Other (Please Specify)
Thank you for participating in my study.