QLL-114

REDUCING THE PERCENTAGE OF ADULT PATIENTS EXPERIENCING MODERATE OR SEVERE PAIN DURING LOCAL ANAESTHESIA ADMINISTRATION OF MAXILLARY DENTAL EXTRACTION PROCEDURE IN KLINIK PERGIGIAN CHEMOR

Yusraa A[2], Khairul Fikri H[1], Nur Maziah M[1], Fatin Nabihah Z[1], Darshinthini P[1], Wan Nur Nadia WM[1]
[1]Klinik Pergigian Chemor, Perak
[2]Klinik Pergigian 1 Malaysia UTC, Perak

KEMENTERIAN KESIHATAN MALAYSIA

INTRODUCTION

Klinik Pergigian Chemor is a main dental clinic in Perak. According to daily records, 42% of adult patients had dental extractions under local anesthesia (LA) in a year. However, feedback from a customer satisfaction survey showed that some patients felt pain during the LA administration. A recent survey found that 77% of adult patients experienced intolerable pain during LA

1.0 SELECTION OF OPPORTUNITIES FOR IMPROVEMENTS

1.1 PROBLEM PRIORITIZATION- SMART

PROBLEM	S	M	A	R	T	TOTAL
Frequent occurence of unreffered impacted maxillary canines among school children under Dental Therapists in SJK(C) POILAM & SEK MEN POILAM	11	12	10	10	8	51
Low rate of antenatal dental check up in Klinik Pergigian Chemor	9	11	10	9	7	46
3. High Percentage number of patients experience pain during Local Anaesthesia(LA) for Maxillary Dental Extraction Procedures in Klinik Pergigian Chemor	15	13	12	14	12	66

REASON FOR SELECTION

S — Data collection showed that 77% of patients have intolerable pain during local anaesthesia.

M — Can obtain data from clinical assessment and survey after the dental procedure.

A — Local anaesthesia (LA) is used daily in dental clinics, especially for extractions. However, it is often the main cause of fear and discomfort for patients.

R — Remedial action could be implemented to improve the working process.

T — Managing pain and anxiety in patients has always been an essential part of dentistry. Hence, it is about time to implement pain-free dental care. Can be completed within a year.

1.2 LITERATUE REVIEW

Pain experienced during LA administration for dental procedure is almost a universal concern. Previous studies identified various factors that cause pain during LA administration & some of method to relief pain have been introduced. These include applying of slow injection, hide needle technique, vibration technique, cold application to buccal mucosa and others.

1.3 PROBLEM STATEMENT

Managing pain and anxiety in dentistry is crucial. Local anesthesia (LA) is commonly used to minimize pain, but the fear and discomfort of the injection itself can be a significant barrier for many patients. At Klinik Pergigian Chemor, from October to December 2019, a high percentage of adults reported moderate to severe pain (pain scores of 4 or above) during LA injections. This pain can increase fear and anxiety, making patients reluctant to receive necessary dental treatments. Factors contributing to this issue include an unsuitable clinic environment, inadequate preparation, patient pain thresholds, and differences in LA administration techniques. The goal is to reduce the number of adults experiencing moderate to severe pain during local anesthesia at Klinik Pergigian Chemor.

2.0 KEY MEASURES OF IMPROVEMENT

### 2.1 CAUSE EFFECT ANALYSIS
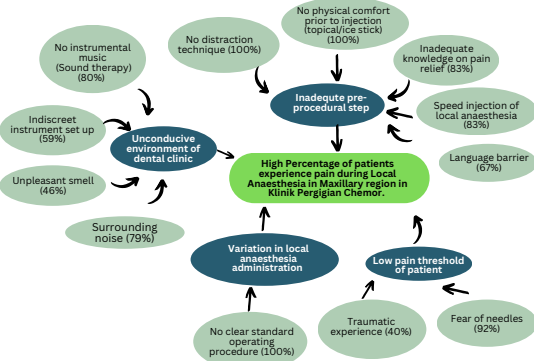
2.2 STUDY OBJECTIVE

OBJECTIVE

To reduce the percentage of adult patients experiencing moderate or severe pain during local anaesthesia (LA) administration in KlinikPergigianChemor

SPECIFIC OBJECTIVE

- To identify the magnitude of pain in patients during local anaesthesia.
- To identify the contributing factors of pain in patients during local anaesthesia.
- To formulate remedial actions that could help to reduce pain during local anaesthesia.
- To evaluate the effectiveness of remedial measures in reducing pain during local anaesthesia.

2.3 PROCESS OF CARE
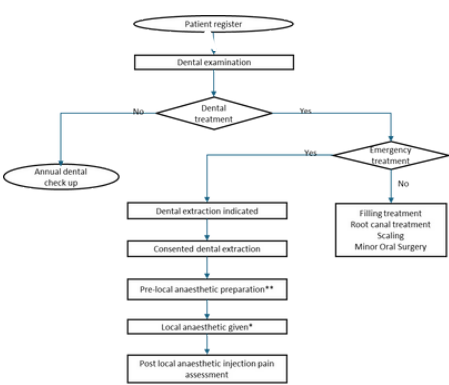
2.4 INDICATOR AND STANDARD

Indicator : Percentage of patients with pain score 4 to 10 during local anaesthesia prior to maxillary dental extraction.

FORMULA:

$$\frac{\text{Number of patients with pain scores of 4 to 10 during LA}}{\text{Number of patients subjected to maxillary dental extraction under LA}} \times 100\%$$

Standard: ≤ 20% of patients having pain during local anaesthesia.

3.0 PROCESS OF GATHERING INFORMATION

3.1 METHODOLOGY

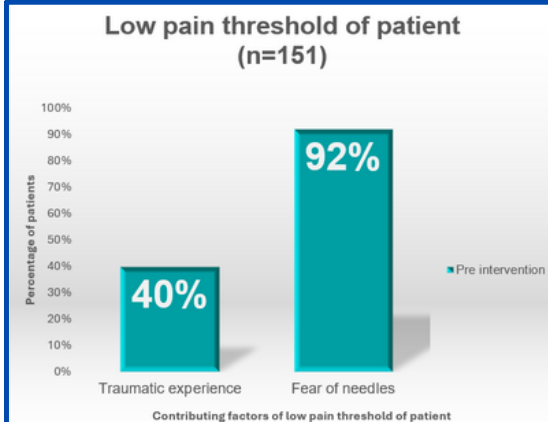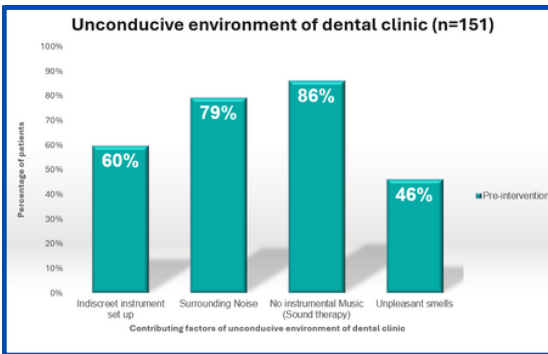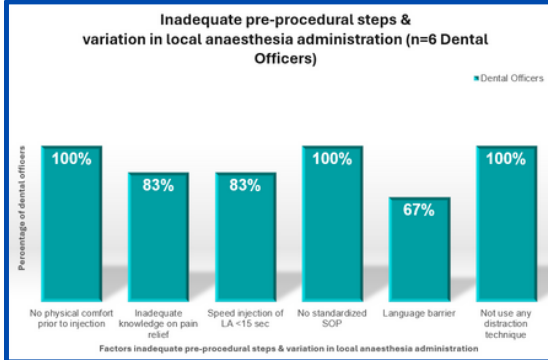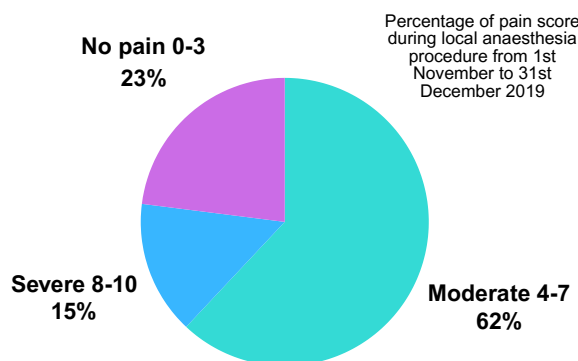| Study Design	Quality improvement study	
Study period	Pre-intervention	1st Nov – 31st Dec 2019
	Intervention	1st Jan – 30th March 2020
	Post-intervention	1st Apr – 30th Jun 2020
	2nd Post-intervention	1st Jan – 30th March 2022
Sample population	All adult patient who require LA injection for extraction of maxillary teeth	
Sampling method	Purposive sampling	
Sample size	151 (Pre-intervention) , 82 (post-intervention) & 76 (2nd Post-intervention)	
Study tools	LP8, Questionnaire, Practical Assessment Form, Daily report of P5VS, Pain scale.	

INCLUSION CRITERIA

All adult patients (above 18 years old) who require LA injection for maxillary dental extraction and are willing to be enrolled

EXCLUSION CRITERIA

1. Mentally challenge / uncooperative patient
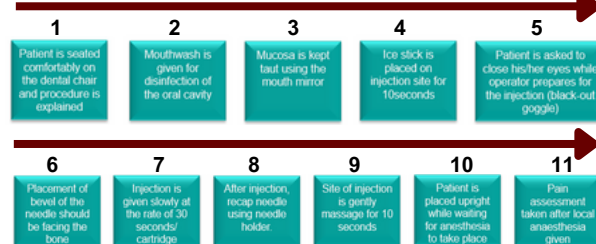2. Uncontrolled hypertension / diabetes
3. Physically disabled patient

4.0 ANALYSIS AND INTERPRETATIONS

PRE-INTERVENTION RESULTS, N=151 PATIENTS

Percentage of pain score during local anaesthesia procedure from 1st November to 31st December 2019

- No pain 0-3: 23%
- Severe 8-10: 15%
- Moderate 4-7: 62%

Inadequate pre-procedural steps & variation in local anaesthesia administration (n=6 Dental Officers)

Unconducive environment of dental clinic (n=151)

Low pain threshold of patient (n=151)

5.0 STRATEGIES FOR CHANGES

INADEQUATE PRE-PROCEDURAL STEP

1. Innovative ice sticks
2. Clinical training for dental officers to apply slow injection technique and hide-needle-technique

2 STANDARDIZATION OF LOCAL ANAESTHESIA PROCEDURE

A new standardization of local anesthesia (LA) administration procedure was introduced under supervision of by Oral Maxillofacial Surgeon (OMFS) Hospital.

1. Patient is seated comfortably on the dental chair and procedure is explained
2. Mouthwash is given for disinfection of the oral cavity
3. Mucosa is kept taut using the mouth mirror
4. Ice stick is placed on injection site for 10seconds
5. Patient is asked to close his/her eyes while operator prepares for the injection (black-out goggle)
6. Placement of bevel of the needle should be facing the bone
7. Injection is given slowly at the rate of 30 seconds/ cartridge
8. After injection, recap needle using needle holder
9. Site of injection is gently massage for 10 seconds
10. Patient is placed upright while waiting for anesthesia to take place
11. Pain assessment taken after local anaesthesia given

3 LOW PAIN THRESHOLD OF THE PATIENT

1. Calm the patient with the hide-needle technique
2. Patient wears a black-out goggle.

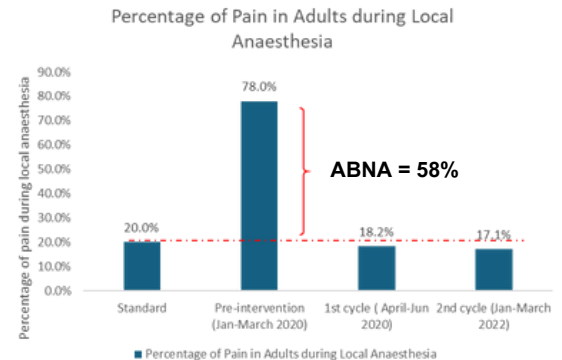❌ PRE-INTERVENTION   ✅ POST-INTERVENTION

4 UNCONDUCIVE ENVIRONMENT OF THE DENTAL CLINIC

1. Turn on the radio while treating the patient
2. Discreet instruments set-up

6.0 EFFECT OF CHANGES

Percentage of Pain in Adults during Local Anaesthesia

- Standard: 20.0%
- Pre-intervention (Jan-March 2020): 78.0%
- 1st cycle (April-Jun 2020): 18.2%
- 2nd cycle (Jan-March 2022): 17.1%

ABNA = 58%

POST-INTERVENTION PAIN ASSESSMENT AFTER GIVING LOCAL ANAESTHESIA IN KLINIK PERGIGIAN CHEMOR (CYCLE 1 & 2)

	Pre-intervention	Post-intervention (cycle 1)	Post-intervention (cycle 2)
No pain (0-3)	22.50%	62.25%	82.27%
Moderate pain (4-7)	15.23%	81.70%	—
Severe pain (8-10)	—	18.29%	17%
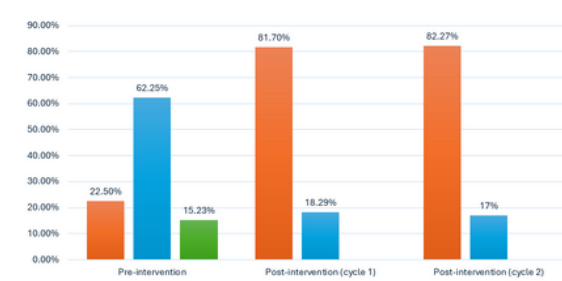
NEW MODEL OF GOOD CARE

	Critical steps	CRITERIA	Standard	Result (PRE)	Result 1st cycle	Result 2nd cycle
1	Consented dental extraction	History and investigation are taken by a dental officer and consent are taken for a following dental procedure such as unrestorable tooth, mobile tooth, abscess, and extraction for orthodontic treatment.	100%	100%	100%	100%
2	Pre-local anesthetic preparation	Application of ice stick on site of injection before local anaesthesia procedure for 10 seconds.	100%	0%	100%	100%
3	Local anaesthesia administration	A new standard operating procedures are performed by a dental officer using a short needle ensuring :- hide-needle technique. - bevel facing bone - slow injection technique within 15s estimated by dental officer	100%	0%	100%	100%
4	Post local anaesthetic injection pain assessment	Pain assessment is taken using The Pain as Fifth Vital sign (P5VS) scale which was recommended by Ministry of Health (MOH) This tool consists of Visual Analog Scale/ Numerical rating scale. (Moderate to severe 4-10). The pain scale was adopted from the International Association for the Study of Pain (IASP) 2017	≤20%	77.50%	18.29%	17.10%

7.0 THE NEXT STEP

1. The Project had been approved in Mesyuarat Pengurusan Daerah Kinta to implement the standardized local anaesthesia steps in other dental health facilities of Kinta district.
2. Sharing sessions of the project with all SDO's of Perak in Mesyuarat hala tuju inisiatif kualiti in the state level.
3. To incorporate into the orientation of the new dental officers that newly joined primary dental clinics and as a regular audit to all the dental officers.

7.0 REFERENCE/ACKNOWLEDGEMENT

1. Malamed SF. Allergy and toxic reactions to local anesthetics. Dent Today. 2003;22:114–116. 118–121.
2. Ghaderi, F., Banakar, S., & Rostami, S. Effect of pre-cooling injection site on pain perception in pediatric dentistry: "A randomized clinical trial". Dent Res J (Isfahan), 2013 ;10(6), 790-794.
3. A. Liinavuori, M. Tolvanen, V. Pohjola, and S. Lahti, "Changes in dental fear among Finnish adults: a national survey," Community Dentistry and Oral Epidemiology.
4. S. K. S. Ng and W. K. Leung, "A community study on the relationship of dental anxiety with oral health status and oral health-related quality of life," Community Dentistry and Oral Epidemiology.
5. Mosby's medical dictionary. (8th ed.). St. Louis, MO: Mosby Elsevier.

We would like to thank the Director General of Health Malaysia for his approval to present this study. We are also grateful to our Perak State Health Director, Deputy Director of Perak State Health Department (Dentistry Division), District Health Officer of Pejabat Kesihatan Pergigian Daerah Kintar for their contribution, commitment and supports during the project

This E-Poster was prepared for presentation at the 12th National QA Convention, 8-10 Oct 2024, Negeri Sembilan