

# Effect of Vocal Anesthesia on Adult Dental Patients during Covid-19 pandemic period

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## Abstract

**BACKGROUND:** Pain is as a major concern with dental patients. The dentist-patient interaction can reveal the presence of anxiety and fear, which may result in rise of pain. This study aimed to assess vocabulary communication as support to dental anesthesia on the adult dental patient.

**MATERIALS AND METHODS:** This is a prospective, randomized clinical study, conducted from February 2020 through March 2021. Two hundred individuals (112 males, 88 females) of the age range (16 to 84 years) were separated into two groups for testing the level of pain during dental local anesthesia, with vocal communication and without vocal communication.

**RESULTS:** While the control group showed no difference between males and females, there was a difference between the sexes in the experimental group with past dental visits, VAS and injection type having less anxiety ( $p=0.0001$ ) while with education/VAS having ( $p\leq 0.01$ ) as appear in sex to age ( $p\leq 0.05$ ). There was no difference when data were compared by age, or type of anesthesia (inferior alveolar nerve block or infiltration technique).

**CONCLUSION:** Dental anxiety can be alleviated by talking to the patients before the procedure, which could reduce the amount of pain.

**KEYWORDS:** Anesthesia; Local; Dental Anxiety; Vocabulary; Communication

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## Introduction

Most dental procedures require pain control [1]. Pain in its traditional sense can be considered as an indicator or alarm for potential tissue damage. Pain response varies based on psychological state, social stratum, age, and other factors. Hence, one can say that pain loses some efficiency, and no longer is a reliable indicator of tissue damage [2].

The site of the dental needle injection, the thickness of the tissue to be pierced by a dental needle, and the degree of tissue adherent to deeper structures are strongly related to the patient's pain sensitivity and anxiety [3].

The interaction between the dentist and the patient can reveal the presence of anxiety and fear [4]. It is not uncommon that dental injection

is used as intimidation for children [5].

Patients with generalized anxiety disorder exposed to changing in talk used as treatment ended with significantly different levels of response according to the severity of the case [19]. To demonstrate that vocal anesthesia can improve analgesia in dental procedures this study aimed to assess vocabulary

communication as support to dental anesthesia on adult dental patients.

**Material and Methods**

This is a prospective, single-blinded, randomized observational prognostic controlled clinical study. The study was conducted through the Covid-19 pandemic, from February 2020 through March 2021, at Al-Bayan university, college of dentistry, in Bagdad, Iraq. Approval by the local ethics committee according to the Declaration of Helsinki guidelines was obtained. Two hundred (112 males, 88 females) of the age range (16 to 84 years) participated in the study. All participants had a Covid-19 infection and recovered from the disease. The individuals were separated into two groups for testing the level of pain due to dental local anesthesia.

Written consent was obtained from patients, explaining that information asked was only for research purposes. The treatment modality (with vocal communication vs. without vocal communication) was decided by tossing a coin, where 'face' was the experimental side and 'back' for control.

The study was performed using the "single injection method" to remove acquiescence bias. This is where only one injection of local anesthesia was performed on the patient after a vocabulary communication with the patient to explain the pain pattern before injection (study group, N=94),

and direct injection of local anesthetic agent to patient without any verbal communication (control group, N=106). Patients were numbered from 1 to 200. Excluded patients from the study were the ones that had uncontrolled systemic diseases or a clinically significant medical history, or if they regularly used analgesic medications or anti-inflammatory medication in the last 24 hours prior the day of the experiment. We also excluded pregnant women or women breast-feeding. Tobacco smokers using ten or more cigarettes per day were also excluded. All areas that were injected were free from infection, inflammation, and the patient did not seek emergency treatment because of pain. All patients were injected with 2% lidocaine with 1:80000 adrenalin dental local anesthetic solution through dental needle gauge 27. Six different dentists were operating in this study with different days and times through the day and different degrees of experience from general practitioners, orthodontists, prosthodontists, and oral surgeons. IBM SPSS Statistics V.26 statistical analysis software program was used

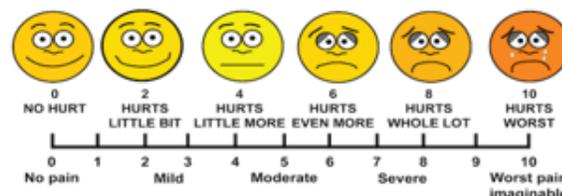
to evaluate the experiment through t test using p-value  $\leq 0.05$  as statistically significant for rejection of the null hypothesis. Every patient experience was recorded using a questionnaire.

Pain was assessed by a 10 mm visual analog scale (VAS) with the two ends assigned as no pain and worst pain ever. When the pain was present, the patient was asked to select a category from 1 to 10. Then, the score was recorded in the case sheet used in this study (Appendix 1).

**Appendix 1.** Study instrument.

Name:	Age:	Gender:	Mobile no:
Occupation:	Education:	Maternal status: <input type="checkbox"/> single <input type="checkbox"/> married	Id:
Mx Hx:			
Previous injection	<input type="checkbox"/> IV	<input type="checkbox"/> IM	<input type="checkbox"/> SC
Prev. Dental operation	null	Little(once/year)	Frequent(once/3months) Usual(monthly)
Prev. other operations	Yes (number)		no
Vocal anesthesia	<input type="checkbox"/> yes	<input type="checkbox"/> No	VAS score
Procedure	site	injection type	

**PAIN MEASUREMENT SCALE**



Baker faces pain rating scale (WBFRS)

Dentist: \_\_\_\_\_

Date: \_\_\_\_\_

Pain sensitivity differences between sexes was assessed. Patient age was tested for compliance to dental work and dental-injection despite anxiety. Type of injection was recorded. Infiltration of almost all the maxillary teeth and some of the mandibular injections or block anesthesia mainly for the inferior alveolar nerve block were used for treating the study participants.

Past dental procedures and patient regular visits to the dentist were recorded as null, little, frequent, and usual. Frequency of dental visits was

recorded as first-time the patient seeking a dental office, once in a year, once a month, and if he the patient went to the dentist on a monthly basis or even less. Education level, procedures, and marital status were also recorded.

## Results

Table 1 summarizes the 200 study participants. Table 2 describes the distribution of the sex of the participants by ethnicity.

Differences were found when age was compared to the sex of the

participants. Samples were tested according to age and VAS score, as well as the distribution of samples according to age and marital status and VAS score, appeared statistically significant ( $P \leq 0.05$ ) (Tables 2, 3 and 5). Several differences were detected when looking at the distribution of the sample by sex and VAS score, education and VAS score, past dental office visits and VAS score. Other comparisons included distribution of the sample by injection of anesthesia type and VAS, which appeared to be statistically significant different (Tables 4, 6, 7, 8 and 9).

**Table 1.** Distribution of variables in the sample studied.

Variable	N	Chi-square (p-value)
Male	112	2.88
Female	88	(0.09)
Young Adults	41	51.6
Middle Age	114	(0.0001)
Elderly	45	
Single	116	5.12
Married	84	(0.02)
Low	15	71.06
Mid	111	(0.0001)
High	74	
Null	4	186.72
Little	130	(0.0001)
Frequent	44	
Usual	22	
IADB	67	21.78
Infiltration	133	(0.0001)
Control	106	0.49
Experiment	94	(0.48)
No Pain	22	95.4
Mild	61	(0.0001)
Moderate	79	
Severe	37	
Worst Pain	1	

**Table 2.** Distribution of sample according to age and sex.

Age Group	15-25	26-35	36-45	46-55	56-65	66-75	76-85	Totals
M (no.)	23	10	17	20	16	12	14	112
F (no.)	18	12	17	10	12	12	7	88
Total	41	22	34	30	28	24	21	200
Chi-Square $\chi^2$ (P-value)	5.29* (0.05)							
* (P≤0.05).								

**Table 3.** Distribution of sample according to age and VAS/E&C.

Age	15-25		26-35		36-45		46-55		56-65		66-75		76-85		Totals	
VAS	E	C	E	C	E	C	E	C	E	C	E	C	E	C	E	C
Never	6	0	4	0	4	0	4	0	2	0	1	0	1	0	22	0
Mild	11	0	7	0	7	0	10	1	10	1	8	0	6	0	59	2
Moderate	2	13	2	6	3	12	1	9	1	6	2	9	2	11	13	66
Sever	0	8	0	3	0	8	0	5	0	8	0	4	0	2	0	38
Worst	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	20	22	13	9	14	20	15	13	13	15	11	13	8	12	95	106
Percent %	21.1	20.7	13.7	8.5	14.7	18.9	15.8	12.3	13.7	14.2	11.6	12.3	8.4	11.3	100%	
Chi-Square $\chi^2$ (P-value)	6.38* (0.02)															---
* (P≤0.05).																

**Table 4.** Distribution of sample according to sex and VAS/E&C.

Sex	Male		Female		Totals	
VAS	E	C	E	C	E	C

<b>Never</b>	4	0	18	0	12	0
<b>Mild</b>	22	2	37	0	59	2
<b>Moderate</b>	1	53	12	13	13	66
<b>Sever</b>	0	30	0	7	0	37
<b>Worst</b>	0	0	0	1	0	1
<b>Total</b>	27	85	67	21	94	106
<b>Percent %</b>						
<b>Chi-Square <math>\chi^2</math> (P-value)</b>	<b>34.69 ** (0.0001)</b>				<b>---</b>	

**Table 5.** Distribution of sample according to marital status and VAS/E&C.

<b>Marital status</b>	<b>Single</b>		<b>Married</b>		<b>Totals</b>	
	<b>E</b>	<b>C</b>	<b>E</b>	<b>C</b>	<b>E</b>	<b>C</b>
<b>VAS</b>						
<b>Never</b>	8	0	14	0	12	0
<b>Mild</b>	39	0	20	0	59	0
<b>Moderate</b>	6	38	7	22	13	60
<b>Sever</b>	0	24	0	21	0	45
<b>Worst</b>	0	1	0	0	0	1
<b>Total</b>	53	63	41	43	94	106
<b>Percent %</b>	<b>56.38%</b>	<b>59.43%</b>	<b>43.72%</b>	<b>40.57%</b>	<b>100%</b>	
<b>Chi-Square <math>\chi^2</math> (P-value)</b>	<b>5.87* (0.0277)</b>				<b>---</b>	

**Table 6.** Distribution of sample according to Education/VAS/E&C.

Education	Pre-school		Primary- high school		university		Higher		Totals	
	E	C	E	C	E	C	E	C	E	C
<b>VAS</b>										
<b>Never</b>	2	0	13	0	6	0	1	0	22	0
<b>Mild</b>	2	0	30	0	21	2	6	0	59	0
<b>Moderate</b>	1	7	8	38	4	18	0	3	13	66
<b>Sever</b>	0	3	0	21	0	9	0	4	37	0
<b>Worst</b>	0	0	0	1	0	0	0	0	0	1
<b>Total</b>	5	10	51	60	31	29	7	7	94	106
<b>Chi-Square -<math>\chi^2</math> (P-value)</b>	<b>35.02 (<math>p=0.0001</math>).</b>								<b>---</b>	
<b>(<math>P \leq 0.01</math>).</b>										

**Table 7.** Distribution of sample according to past dental visits.

Past Dental. Procedures	Null		little		frequent		Usual		Totals	
	E	C	E	C	E	C	E	C	E	C
<b>VAS</b>										
<b>Never</b>	0	0	14		7	0	1	0	22	0
<b>Mild</b>	1		34	1	16	1	8	0	59	2
<b>Moderate</b>	0	2	8	46	4	10	1	8	13	66
<b>Sever</b>	0	0	0	27	0	6	0	4	0	37
<b>Worst</b>	0	1	0	0	0	0	0	0	0	1
<b>Total</b>	1	3	56	74	27	17	10	12	94	106

<b>Percent %</b>	<b>1.06%</b>	<b>2.83%</b>	<b>59.57%</b>	<b>69.81%</b>	<b>28.72%</b>	<b>16.04%</b>	<b>10.64%</b>	<b>11.32%</b>	<b>100%</b>
<b>Chi-Square <math>\chi^2</math> (P-value)</b>	<b>39.205 ** (0.0001)</b>								<b>---</b>

**Table 8.** Distribution of sample according to VAS/E&C.

<b>VAS Group</b>	<b>Never</b>	<b>Mild</b>	<b>Moderate</b>	<b>Sever</b>	<b>Worst</b>	<b>Totals</b>
<b>Control</b>	0	2	66	37	1	106
<b>Experiment</b>	22	59	13	0	0	94
<b>Total</b>	<b>22</b>	<b>61</b>	<b>79</b>	<b>37</b>	<b>1</b>	<b>200</b>
<b>Chi-Square <math>\chi^2</math> (P-value)</b>	<b>95.400 ** (0.0001)</b>					<b>---</b>

**Table 9.** Distribution of sample according to injection type/VAS/E&C.

	<b>IANB</b>		<b>Infiltration</b>		<b>Totals (mean)</b>	
	<b>E</b>	<b>C</b>	<b>E</b>	<b>C</b>	<b>E</b>	<b>C</b>
<b>Never</b>	7	0	15	0	22	0
<b>Mild</b>	16	1	44	0	60	1
<b>Moderate</b>	2	24	11	34	13	58
<b>Sever</b>	0	16	0	29	0	45
<b>Worst</b>	0	1	0	0	0	1
<b>Total</b>	<b>25</b>	<b>42</b>	<b>70</b>	<b>63</b>	<b>95</b>	<b>105</b>
<b>Chi-Square <math>\chi^2</math> (P-value)</b>	<b>23.483 ** (0.0001)</b>				<b>---</b>	

## Discussion

Age, sex, and the surroundings are just a few of the many factors that might have an impact on how people

experience pain [20]. The results of the current study showed that injection with the aid of vocabulary anesthesia caused statistically less

pain in comparison with the conventional method in males and females. In comparison to men, women reported more pain and had

a lower pain threshold. This difference was not seen for the other variables. The mechanism underlying this disparity may be due to that neuro-perception processes of pain and pain inhibition correlates with sex differences (20,23). Although needle phobia is a common phobic condition and over 20% of adults aged 20–40 years old have fear of needles [24,25]. Age differences in pain perception were less consistent in our study and the results were insignificant. Some studies implied that pain sensitivity is higher in older adults, whereas others suggest a decrease in sensitivity with age [26]. Pain is commonly under recognized and undertreated in older adults compared to younger adults [27].

There was a significant difference in the experience of pain between the single and married patients who received vocal anesthesia and the effect of marital status on pain. There is a report describing the relation of marriage and chronic pain (29), which stated that marital status was not associated with immediate pain-related unpleasantness.

In contrast to a previous study from the United States [30], which stated that adults with higher levels of education generally report less pain our results were did not show differences.

Kaufman et al. [31] reported that the inferior alveolar nerve block was more painful than local infiltration or another dental nerve block. However,

differences in our study results were insignificant. Another study [32, 33] also found no difference between injection techniques. Previous dental experience likely prepares patients for pain associated with injections [33].

The majority of patients in this study had previous dental procedures and hence injections. Pain perception during the past dental injection is associated with anxiety for the next injections. This result is consistent with other studies that reported the presence of an association between the amount of pain felt during injection and the progressive level of anxiety for injection within subsequent dental visits [34-36].

### Conclusion

Dental anxiety and phobia can be alleviated by simply talking to the patients before the procedure. which could reduce the amount of pain felt by the patient.

The dentist should take the time needed to communicate with the patient before the dental procedure. even before explaining the procedure needed for treatment, to reduce anxiety before interventions requires the identification of their fears and any social conflict or previous bad experiences.

All successful treatment will rest on dentist-patient acceptance, and thus a relaxed patient will result in a less

stressful environment for the dental team and lastly treatment outcomes.

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