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Role of Encouraging Words in Reducing Anxiety and Pain During Tooth Extraction

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الخلاصة

الأهداف: تهدف الدراسة الى إختبار تأثير الكلمات التشجيعية التي يقدمها طبيب الأسنان في مستويات القلق والألم الذي يعاني منها المرضى بعد قلع الأسنان. **المواد وطرائق العمل**: تم اختيار المرضى وتقسيمهم عشوائيا إلى مجموعة السيطرة ومجموعة أخرى تخضع للتشجيع قبل عملية القلع من خلال لقاء لمدة عشر دقائق مع طبيب الاسنان المعالج، حيث تحدد مصادر القلق خلال اللقاء ويعطى كل مريض ضمن هذه المجموعة تشجيعا وفقًا لاحتياجاته. يتلقى المرضى في مجموعة السيطرة تطمينات عامة قبل الجراحة. أكمل جميع المرضى استبيانات عدة لقياس مدى القلق والألم. **النتائج**: المناقشة مع المرضى فضلا عن تشجيعهم يؤثر بشدة على مستويات القلق والألم عند المرضى بعد قلع الأسنان. **الاستنتاجات**: يجب على أطباء الأسنان إعتماد ممارسة تشجيع المرضى خلال فترة زمنية قصيرة قبل قلع الأسنان.

ABSTRACT

Aims: The present study tests the effect of preoperative encouraging words provided by dental clinician on the levels of anxiety and pain experienced by patients after tooth extraction. **Materials and methods:** Patients were randomly assigned to the intervention and the control group. Intervention subjects had pre-operative ten minutes appointment with operating oral surgeon. This appointment identify the sources of anxiety, and participants given individualized encouragement according to their needs. Control subjects received reassurance immediately before surgery. All patients completed several questionnaires covering measures of anxiety and pain. **Results**: Discussion with patients along with encouragement highly affects patients' levels of anxiety and pain after tooth extraction. **Conclusions**: Dental clinicians should consider the practice of encouraging patients shortly before tooth extraction.

Key words: Dental anxiety; Dental pain; Tooth extraction; Encouraging words

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INTRODUCTION

Anxiety and fear toward unpleasant stimuli are common psychological responses of patients seen in dental practice. Anxiety is a psychological and physiological state that prepare a person for actual or potential threatening situations. Whereas fear is the reaction to the perceived threat [(1)]. However, these terms sometimes used interchangeably.

Researchers found that the prevalence of mild dental anxiety and fear among population were 43% and 19.8% respectively [2,3]. While the severe trait of anxiety, as reported by other researchers, were 11.7%, 14.9%, and ١٦.1% [4-6].

Fear from dental treatment is associated with reduced dental visits, deteriorated oral health, more functional and esthetic impairment, and subsequently a reduced quality of life [7-9].

Different dental procedures have different level of anxiety. For example, dental injection and tooth extraction are in the top list of most frightening dental procedures [10-13]. In spite of dental injections are used to reassure patients by providing painless treatment, these injections are considered a source of anxiety and fear for some patients [14]. Oosterink et al.[6] found that dental patients considered oral surgery to be the most fearful procedure among other dental interventions. Moreover, up to 91% oral surgery procedures were tooth extraction. Tooth extraction is an invasive procedure with pre and intraoperative anxiety and possible postoperative pain [15], so it needs attention from the psychological point of view.

A strong relationship was found between anxiety and pain [15-17]. Researchers found that lowering of dental anxiety was associated with reduced levels of fear of dental pain and ultimately lower levels of perceived pain [18].

As it is difficult for dentists to deal with anxious patients, evaluation of the patient's psychology along with special preparation and mood modification are required [19]. Many medical and non-medical modalities were used to reduce anxiety and pain related to dental surgery. Pre-emptive analgesia [20,21] is effective way in reducing postoperative pain. Conscious sedation and general anesthesia [22,23] are useful to improve the psychological status of patients, but they need to specialist selection according to the clinical situation [24].The non-medical ways like music therapy [25,26], fragrance therapy [27], and hypnosis [28] were found to reduce patients' intraoperative anxiety.

The aim of the present study is to test whether the individualized encouraging wards can affect the patients' beliefs and attitudes concerning dental injection and tooth extraction.

MATERIALS AND METHODS

Subjects:

Patients at the Department of the Oral Surgery, Al-Nour Specialized Dental Centre, Mosul, Iraq, were taken for tooth extraction. A local ethics committee approved the study (18/50-175), and all the patients provided written informed consent.

Exclusion criteria were surgical/difficult tooth extraction, patients <18 years old, cognitive or mental disability, illiteracy, and those who refused to participate.

Procedure:

Two research assistants, with a request to participate, approached subjects in the waiting room. Candidates asked to rate the amount of their inventory dental anxiety and fear of dental pain, in addition to their attitude toward previous dental injections, by answering questions of the Arabic-language version of the following questionnaires: Short version of Dental anxiety inventory questionnaire (s-DAIQ) [(29)]. It comprised 9 items, rated on a Likert type scale scored from 1 (no anxiety at all) to 5 (extreme anxiety), yielding a total score ranging from 9 to 45.

Short version of Fear of dental pain questionnaire (s-FDPQ) [(30)]. It consists of 5 items, each rated on a 5-point Likert type scale, with a total score range of 5-25.

The previous experience of patients with dental injections were evaluated through 4 questions (PEDIQ) [(31)] with responses scored from 1-5, giving a total score of 5-20. Answers were given on a 5-point answer scale. After questionnaires were filled out, patient enrolled randomly by random-number table in to a control group and intervention group. In the first group, extraction performed without any discussion regarding the sources of related anxiety. In the second group, participants had pre-operative ten minutes appointment with operating oral surgeon. This appointment identify the sources of anxiety, and participants given individualized encouragement according to their needs. In addition to question and answer discussions with the patient and explaining the procedure.

Anxiety and pain measurement:

Just before surgery, A 0 (no anxiety/pain) to 10 (extreme anxiety/pain) Numeric Rating Scale (NRS)[(32)] was used to measure patients' pre-injection and pre-extraction anxiety, in addition to the expected pain because of the injection and tooth extraction.

Patients also asked to rate the experienced anxiety and pain during the injection and extraction immediately at the end of the related procedure using the 11-point NRS. Rating of these parameters done under the supervision of a research assistant. A single experienced oral surgeon did all procedures under local anesthesia using a standard technique.

Statistical analysis:

The mean scores and standard deviations for each questionnaire and NRS were computed. Then, the independent samples t-tests were used to compare the means between and within the two groups of study. For all statistical analysis, the level of significance was set at $P = 0.05$. In addition,

Spearman correlation was used to study the relation between different questionnaires and the anxiety and expected pain values recorded by patient before surgery.

RESULTS

Of the 80 patients enrolled only 71 filled-out the questionnaires completely, 58 (81.7%) of whom were female and 13 (18.3%) male. Their mean age (SD) was 33.97(10.43) years, range18-70.Questionnaires used in this study were reliable with Cronbach alpha values of 0.766, 0.753, and 0.674 for s-DAIQ, s-FDPQ, and PEDIQ respectively. There were no significant differences in the mean scores between the two groups of study regarding the s-DAIQ, s-FDPQ, PEDIQ, pre-extraction anxiety, and the expected post-injection/extraction pain. An exception is the pre-injection anxiety where fewer values recorded in control group (Table 1).

Table (1): Mean scores of different questionnaires, pre and expected post-treatment anxiety and pain of the study groups.

	Mean (SD) scores Intervention group (N=37)	Mean (SD) scores Control group (N=34)	*P* value
s-DAIQ	25.95(6.7)	24.74(7.21)	.947
s-FDPQ	13.62(4.03)	13.18(4.02)	.643
PEDIQ	10.53(2.87) [$]	9.79(3.85) [$$]	.153
Pre-injection anxiety	5.11(2.51)	3.76(2.4)	.024[*]
Expected post-injection pain	4.54(2.49)	3.65(2.19)	.114
Pre-extraction anxiety	5.65(2.61)	4.77(2.7)	.165
Expected post-extraction pain	5.01(2.63)	4.77(2.57)	.691

s-DAIQ: Short version of Dental anxiety inventory questionnaire.
s-FDPQ: Short version of Fear of dental pain questionnaire.
PEDIQ: The previous experience of patients with dental injections.
[$] N=32(PEDIQ not obtained in 5 patients with first experience with injection).
[$$] N=33(PEDIQ not obtained 1 patient with first experience with injection).
[*] Significant at 0.05 level.

A high positive correlation existed between the PEDIQ with pre and expected post-injection anxiety and pain scores of all patients (Table 2). Similarly, a positive correlations were also found between the s-DAIQ and s-FDPQ with pre and expected post-extraction anxiety and pain scores (Table 3).

Table (2): Spearman correlation of PEDIQ with pre and expected post-injection anxiety and pain scores of all patients.

	PEDIQ	Pre-injection anxiety	Expected post-injection pain
PEDIQ	1	.651**	.492**
Pre-injection anxiety	.651**	1	.632**
Expected post-injection pain	.492**	.632**	1

PEDIQ: The previous experience with dental injection questionnaire.
**Correlation is significant at the 0.01 level (2-tailed).

Table (3): Spearman correlation of s-DAIQ and s-FDPQ with pre and expected post-extraction anxiety and pain scores of all patients.

	s-DAIQ	s-FDPQ	Pre-extraction anxiety	Expected post-extraction pain
s-DAIQ	1	.295*	.326**	.266*
s-FDPQ	.295*	1	.593**	.267*
Pre-extraction anxiety	.326**	.593**	1	.454**
Expected post-extraction pain	.266*	.267*	.454**	1

s-DAIQ: Short version of Dental anxiety inventory questionnaire.
s-FDPQ: Short version of Fear of dental pain questionnaire.
**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

After application of local anesthesia and teeth extraction, a significant reduction in post-injection/extraction anxiety and pain was found in intervention group only (Table 4).

Table (4): Comparison between the pre-treatment/expected post-treatment and post-treatment anxiety and pain mean scores (SD) of the study groups.

	Pre-injection anxiety	Post-injection anxiety	*P* value
Intervention group	5.11(2.51)	3.57(2.85)	.016*
Control group	3.76(2.4)	3.06(2.34)	.223
	Expected post-injection pain	Post-injection pain	*P* value
Intervention group	4.54(2.49)	3.05(2.58)	.014*
Control group	3.65(2.19)	3.56(2.27)	.871
	Pre-extraction anxiety	Post-extraction anxiety	*P* value
Intervention group	5.65(2.61)	4.3(2.91)	.039*
Control group	4.77(2.7)	4.85(3.45)	.907
	Expected post-extraction pain	Post-extraction pain	*P* value
Intervention group	5.01(2.63)	2.6(2.95)	.000*
Control group	4.77(2.57)	3.85(3.32)	.210

* Significant at 0.05 level.

DISCUSSION

The fear from dental procedures ranked fourth in prevalence among other humans' fear and phobia subtypes [6].Teeth extraction is a known patients' anxious procedure due to not only possible associated pain, but also the fact of losing a tooth is another important anxiety-provoking stimulus [33]. Information can affect patients' knowledge and beliefs. In addition, people who do not have experience with certain dental procedures still form expectations about it, but the problems exist when beliefs are based on inaccurate information [14]. In this study, six patients (8.45%) had never experienced dental injection but the mean of their scores of pre-injection anxiety was 4.67 (SD 1.75).

In dental practice, there are different anxiety and fear measurement scales. In our study, the s-DAI was used as it is easier to use in general dental practice than the original 36-item DAI, and has shown to be reliable and valid [34].

The s-FDPQ was used since it is valid and reliable and quickly screen patients with respect to FDP [35]. It contains three items that is particularly relevant here and concerns fear of pain associated with dental injection and tooth extraction. This fact may explain why s-FDPQ was more correlated with Pre-extraction anxiety than s-DAIQ, and we can consider this questionnaire the best preoperative predictor of anxious patients. All questionnaires used in this study were tested for reliability and showed high Cronbach alpha values. NRS were used to assess the level of anticipated and experienced anxiety and pain. It is simple, quick, widely used, and its scores are suitable for parametric analysis [36].

A good distribution of participants over the groups of study were noticed since there were no significant differences between the two groups regarding the almost all-preoperative measured parameters. Despite, a fewer values of pre-injection anxiety were recorded in control group, a significant reduction in injection- related anxiety were seen in the intervention group which explain the positive effects of encouraging words.

The present study found a positive correlation of pre-injection and pre-extraction anxiety with expectations about pain rather than the actual experience itself. These results were in line with other studies [14]. Researchers [16] suggest that anxious patients generally feel more pain as result of a dental injection, compared with less anxious patients. These findings are compatible with ours. Moreover, propensity to anxiety and pain experience or expectations were found to be associated with tooth extraction anxiety without any conflicts amongst the different studies [1].

The preoperative individualized encouragement in addition to discussions with the patient showed a significant effect ($P < 0.05$) on patient anxiety and pain. This finding could be explained by the fact that the doctor–patient communication is considered an important factor in building trust and confidence between the patient and clinician[37]. In contrast, other studies showed that the levels of patients' anxiety who received verbal information [38] or separate

consultation [39] did not differ. Clinical implications of this study that patients can be encouraged and informed about tooth extraction procedure, so, behavior that is more compliant may occur. In addition, patients became less anxious with more at ease before and during treatment.

CONCLUSIONS

In the present study, patients expected significantly more pain than they experienced. However, these unpleasant sensations could be significantly reduced by providing individualized encouraging wards before dental treatment.

REFERENCES

1. van Wijk AJ, de Jongh A, Lindeboom JA .Anxiety Sensitivity as a Predictor of Anxiety and Pain Related to Third Molar Removal. *J Oral Maxillofac Surg.* 2010; 68:2723-29.
2. Armfield JM, Heaton LJ. Management of fear and anxiety in the dental clinic: a review. *Aust Dent J.* 2013;58:390–407.
3. Agras S, Sylvester D, Oliveau D. The epidemiology of common fears and phobia. *Community Dent Health.* 1969; 10:151–156.
4. Gatchel RJ, Ingersoll BD, Bowman L, Robert-son MC, Walker C. The prevalence of dental fear and avoidance: a recent survey study. *J Am Dent Assoc.* 1983;107:609–10.
5. Thomson WM, Stewart JF, Carter KD, Spencer AJ. Dental anxiety among Australians. *Int Dent J*. 1996;46:320-24.
6. Oosterink FM, de Jongh A, Hoogstraten J. Prevalence of dental fear and phobia relative to other fear and phobia subtypes. *Eur J Oral Sci*. 2009;117:135-43.
7. Armfield JM, Slade GD, Spencer AJ. Dental fear and adult oral health in Australia. *Community Dent Oral Epidemiol.* 2009;37:220–30.
8. Vermaire JH, de Jongh A, Aartman IH. Dental anxiety and quality of life: the effect of dental treatment. *Community Dent Oral Epidemiol.* 2008; 36: 409-16.
9. Eitner S, Wichmann M, Paulsen A, Holst S. Dental anxiety–an epidemiological study on its clinical correlation and effects on oral health. *J Oral Rehabil.* 2006;33:588–93.
10. Liu Y, Huang X, Yan Y, Lin H, Zhang J, Xuan D. Dental fear and its possible relationship with periodontal status in Chinese adults: a preliminary study. *BMC Oral Health*. 2015; 15:18.
11. Oosterink FM, de Jongh A, Aartman IH. What are people afraid of during dental treatment? Anxiety-provoking capacity of 67 stimuli characteristic of the dental setting. *Eur J Oral Sci.* 2008;116:44–51.
12. Yusa H, Onizawa K, Hori M, Takeda S, Takeda H, Fukushima S, Yoshida H. Anxiety measurements in university

students undergoing third molar extraction. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2004; 98:23-7.

13. Earl P: Patients' anxieties with third molar surgery. *Br J Oral Maxillofac Surg*. 1994; 32:293-7.
14. van Wijk A, Lindeboom JA, de Jongh A, Tuk JG, Hoogstraten J. Pain related to mandibular block injections and its relationship with anxiety and previous experiences with dental anesthetics. *Oral Surg Oral Med Oral Pathol Oral Radiol.* 2012;114:S114-9.
15. McNeil DW, Helfer AJ, Weaver BD, Graves RW, Kyle BN, Davis AM. Memory of Pain and Anxiety Associated with Tooth Extraction. *J Dent Res*. 2011; 90: 220-24.
16. van Wijk AJ. , Makkes PC..Highly anxious dental patients report more pain during dental injections. *Br Dent J.* 2008;205:E7.
17. van Wijk AJ, Lindeboom J. The effect of a separate consultation on anxiety levels before third molar surgery. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2008;105:303-7.
18. van Wijk AJ, Hoogstraten J. Experience with dental pain and fear of dental pain. *J Dent Res.* 2005; 84, 947–50.
19. Brahm CO, Lundgren J, Carlsson SG, Nils-son P, Hultqvist J, Ha¨gglin C. Dentists' skills with fearful patients: education and treatment. *Eur J Oral Sci.* 2013;121:283–91.
20. Yamagchi A, Sano K. Effectiveness of pre-emptive analgesia on postoperative pain following third molar surgery: review of literatures. *Jpn Dent Sci Rev*. 2013;49:131– 8.
21. Gopalraju P, Manikarnike Lalitha R, Prasad K, Ranganath K. Comparative study of intravenous Tramadol versus Ketorolac for preventing postoperative pain after third molar surgery – A prospective randomized study. *J Craniomaxillofac Surg*. 2014;42: 629–33.
22. Bennett JD, Kramer KJ, Bosack RC. How safe is deep sedation or general anesthesia while providing dental care? *J Am Dent Assoc.* 2015;146:705–8.
23. Juodzbalys G, Giedraitis R, Maciulskiene V, Huys LWJ, Kubilius R. New method of sedation in oral surgery. *J Oral Implantol.* 2005;31:304–8.
24. Astramskaitė I, Juodžbalys G. Scales used to rate adult patients' psycho-emotional status in tooth extraction procedures: a systematic review. *Int J Oral Maxillofac Surg.* 2017;46:886-98.
25. Kim YK, Kim SM, Myoung H. Musical intervention reduces patients' anxiety in sur- gical extraction of an impacted mandibular third molar. *J Oral Maxillofac Surg.* 2011;69:1036–45.

26. Leardi S, Pietroletti R, Angeloni G, Neco-zione S, Ranalletta G, Del Gusto B. Ran-domized clinical trial examining the effect of music therapy in stress response to day surgery. *Br J Surg*. 2007;94:943–7.
27. Hasheminia D, Kalantar Motamedi MR, Ahmadabadi FK, Hashemzehi H, Haghighat A. Can ambient orange fragrance reduce patient anxiety during surgical removal of impacted mandibular third molars? *J Oral Maxillofac Surg.* 2014;72:1671–6.
28. Glaesmer H, Geupel H, Haak R. A controlled trial on the effect of hypnosis on dental anxiety in tooth removal patients. *Patient Educ Couns*. 2015;98:1112–5.
29. Stouthard MEA: Fear of Dental Treatment (thesis). Amsterdam, Academic Centre for Dentistry Amsterdam, University of Amsterdam, 1989.
30. van Wijk AJ, McNeil DW, Ho CJ, Buchanan H, Hoogstraten J. A short English version of the fear of dental pain questionnaire. *Eur J Oral Sci*. 2006;114:204-8.
31. Matthews DC, Rocchi A, Gafni A. Factors affecting patients' and potential patients' choices among anaesthetics for periodontal recall visits. *J Dent*. 2001;29:173-9.
32. Turk DC, Melzack R: Handbook of Pain Assessment. New York, Guilford Publications, 1992.
33. Siegel K, Schrimshaw EW, Kunzel C, Wolf- son NH, Moon-Howard J, Moats HL, et al. Types of dental fear as barriers to dental care among African American adults with oral health symptoms in Harlem. *J Health Care Poor Underserved*. 2012;23:1294–309.
34. Aartman IHA. Reliability and validity of the short version of the dental anxiety inventory. *Community Dent Oral Epidemiol.* 1988;26: 350–4.
35. van Wijk AJ, McNeil DW, Ho CJ, Buchanan H, Hoogstraten J. A short English version of the Fear of Dental Pain questionnaire. *Eur J Oral Sci*. 2006; 114: 204–208.
36. Al-Samman A A, Al-Nuaime OS, Othman HA. Validity and Reliability of Full Cup Test in Pain Evaluation after Dental Surgery: A Comparison with Four Pain-Rating Scales in a Sample of Iraqi Patients. *JODR.* 2016; 3:2-7.
37. Ha JF, Anat DS, Longnecker N. Doctor–patient communication: a review. *Ochsner J.* 2015;10:38–43.
38. Kazancioglu HO, Tek M, Ezirganli S, Demirtas N. Does watching a video on third molar surgery increase patients' anxiety level? *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2015;119:272–7.

39. Astramskaitė I, Poškevičius L, Juodžbalys G. Factors determining tooth extraction anxiety and fear in adult dental patients: a systematic review. *Int J Oral Maxillofac Surg.* 2016;45:1630-43.