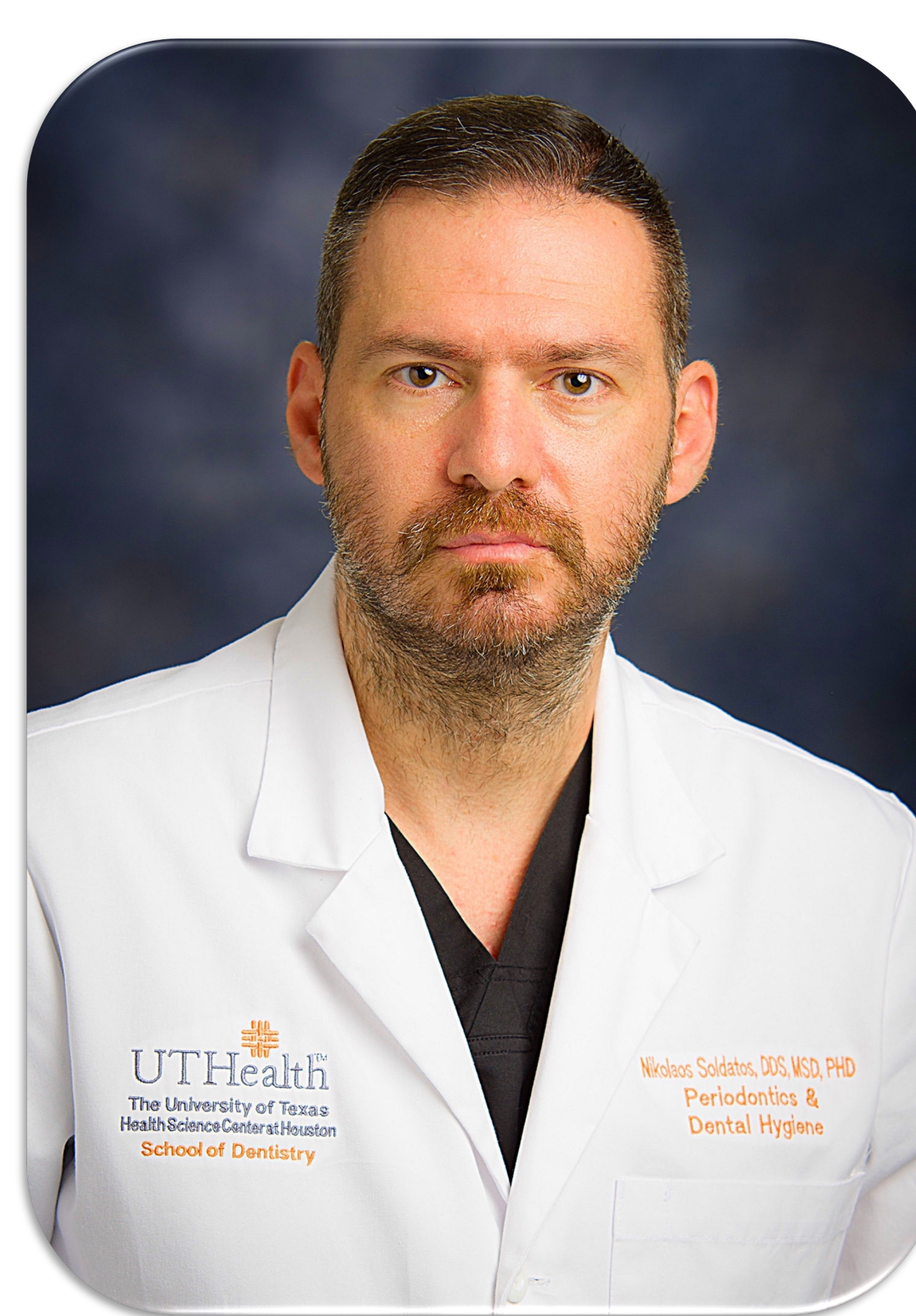
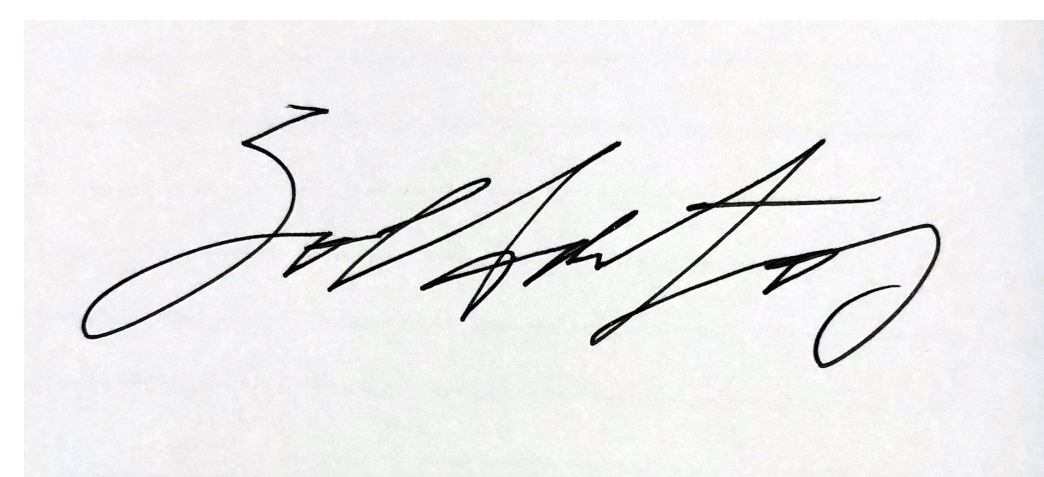


EVALUATION OF THE NEED TO PRESCRIBE OPIOID MEDICATION TO CONTROL POST-SURGICAL PAIN OF DIFFERENT PERIODONTAL/ORAL SURGERIES

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AIM

The two specific aims of this study were: 1) to determine if there is any difference in the level of perceived pain after different types of periodontal/oral surgical procedures, and 2) to determine if there is any difference in patients' selection of pain management protocol (OTC versus prescribed opioid) based on the type of periodontal/oral surgical procedures.

METHODS

This study was approved by the human subject's ethics board of Colorado Multiple Institutional Review Board from the University of Colorado (16-2665) and Institutional Review Board from the University of Texas Health Science Center at Houston (HSC-DB-17-0264). All patients enrolled met the following inclusion criteria: 1) minimum age of 18 years, 2) planned for non-emergent dental treatment and 3) ASA Class I or II.

The study enrolled 104 active, non-emergency patients at the Graduate Periodontics clinic, School of Dental Medicine at the University of Colorado, and 94 patients at the Graduate Periodontics clinic, School of Dentistry at the University of Texas Health Center at Houston, for a total number of 198 participants.

Subjects were asked to complete a surgical pain questionnaire at four time points: 1) before surgery, at the Graduate Periodontics Clinic of both centers, 2) at the first dose of analgesic the day of the surgery at home, 3) 24 hours postoperatively at home, and 4) 72 hours postoperatively at home. The questionnaire consisted of a combination of numerical and descriptive variables to describe the postoperative surgical pain. For pain rate, six numerical variables were used with a scale from 0 to 10 [(Wong Baker FACES Pain Rating Scale (WBS)], and six descriptive pain severity categories 0 to 10 (0-no pain, 2-mild, 4-discomforting, 6-distressing, 8-horrible, 10-excruciating). The patients were also asked to rate their overall pain rate for the last 30 days, to determine their overall state before the periodontal/oral surgical procedure, using the six numerical variables with a scale of 0 to 10 [(Wong Baker FACES Pain Rating Scale (WBS)]. The last page of every time point in the questionnaire consisted of how the patients controlled the pain (OTC or prescribed medication).

Surgical procedures were grouped into five major categories: 1) bone augmentation procedures (BAP): e.g., guided bone regeneration or lateral window sinus lift; 2) teeth extractions (EXT): e.g., surgical extractions with ridge preservation; 3) surgical implant placement (IP); 4) mucogingival surgeries (MGS): e.g., free gingival graft, connective tissue graft, and soft tissue allograft; and 5) pocket elimination procedures (PE): e.g., open flap debridement, guided tissue regeneration, and osseous resective surgery. Statistical analyses were performed using R statistical software and Prism statistical software (version 8.2.1, 2019). The data were treated as a count variable with a generalized linear mixed effects model fit assuming a Poisson distribution. A generalized linear mixed model fit by maximum likelihood (Laplace approximation) was used to determine if there was any significant difference ($P < 0.05$ with 95% confidence interval) in pain level based on the five different types of periodontal/oral surgeries.

RESULTS

A total of 198 patients completed the pain questionnaire and were therefore included in the final analysis. The average age of the patients was 47 years with an age range of 21 to 83 years. There were 98 women and 100 men who participated in the study. Among the types of surgeries, 22 patients received BAP (11%), 51 patients received EXT (26%), 49 patients received IP (25%), 40 patients received MGS (21%), and 33 patients received PE (17%).Generalized linear mixed model fit by maximum likelihood (Laplace approximation) showed that there was a statistically significant difference regarding the perceived pain based on the type of the surgical procedure.

TABLE 1 Fraction of total (%) of subjects taking no medication, OTC, or prescribed medications under each surgical procedure for the 72-hour study period

Pain control (%)	BAP	EXT	IP	MGS	PE
No medication	29.55	34.29	38.05	31.88	34.59
OTC	29.55	32.38	37.56	31.88	24.06
Prescribed	40.90	33.33	24.39	36.25	41.35

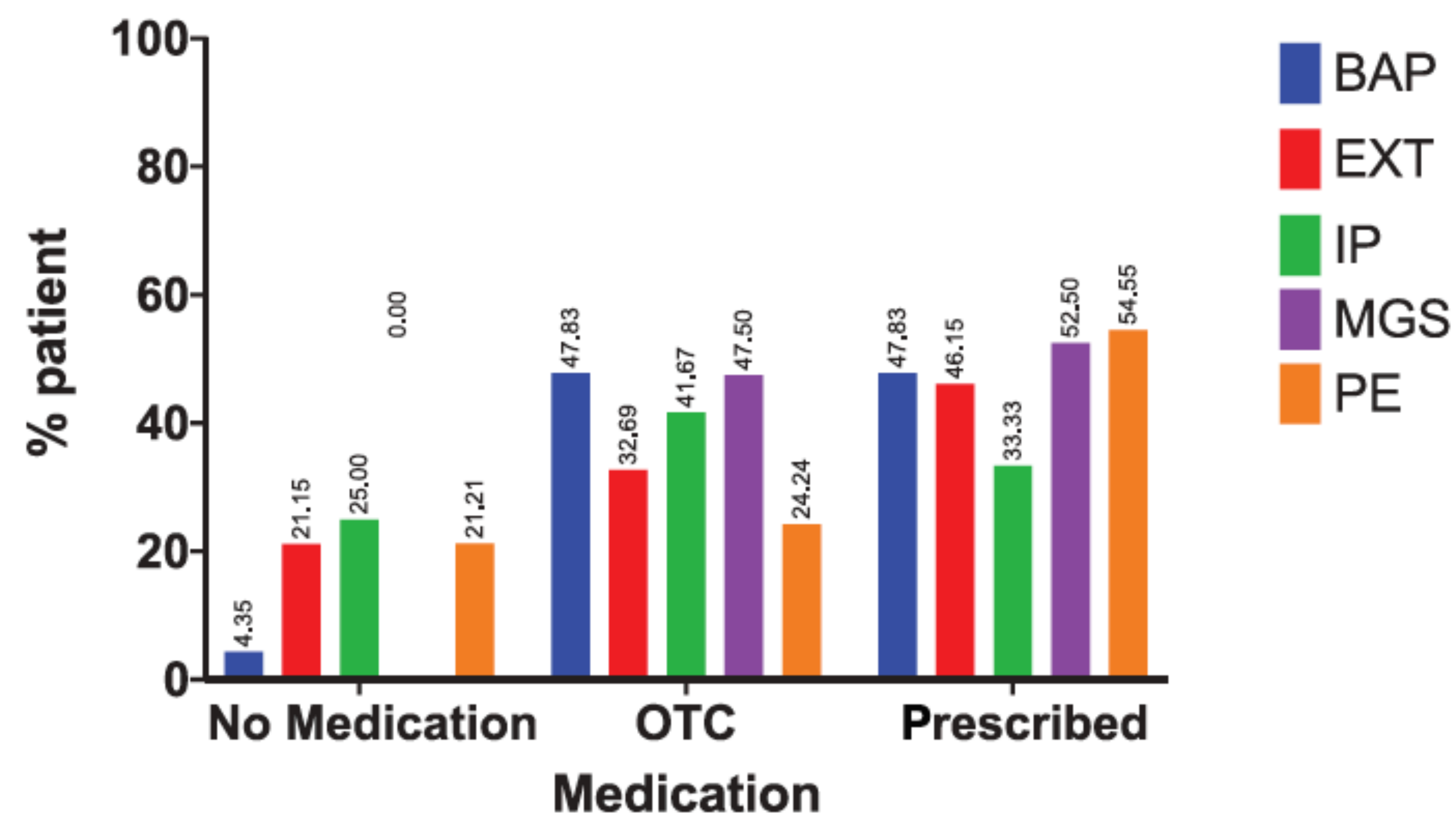
TABLE 2 Total number of patients taking no medication, OTC, or prescribed medications under each surgical procedure, at the 24-hour postoperative period

Pain control	BAP	EXT	IP	MGS	PE	Total (pts)
No medication	1	11	12	0	7	31
OTC	11	17	20	19	8	75
Prescribed	11	24	16	21	18	90
Total (pts)	23	52	48	40	33	196

MGS and **EXT** were associated with significantly higher pain rate and pain severity. **IP** surgery was associated with significant less pain.

Patients who underwent **MGS** were divided in their use of medication, with 52.5% using opioids and 47.5% using OTC medication. For the **IP** group only 33.3% elected to take the opioid medications, while the remaining 66.7% either did not take any medication (25%) or took OTC medication (41.7%). **PE** surgeries showed the highest percentage of patients which took opioid medication at 54.6%. OTC medication was used by 24.2% with 21.2% of patients not taking any medication. The **EXT** group showed 46.2% of the patients took opioid medication, 32.7% OTC medication, and 21.2% no medication. Patients who underwent **BAP** were divided equally between taking the opioid medication and OTC medication at 47.8%, leaving only 4.4% who did not take any medication.

% 24 hr



Bar chart showing percentage of subjects taking no medication, OTC, or opioid medications under each surgical procedure at 24 hours post-surgery

There was a trend seen in the no medication category where within a 72-hour time period the percentage of patients taking no medication increased. At 6 hours post surgically, 16.82% of patients were taking no medications, which increased to 28.97% at 24 hours, and 54.21% at 72 hours. OTC pain medication use remained relatively similar across the time periods (35.56% at 6 hours, 33.33% at 24 hours, 31.11% at 72 hours). The opioid group of patients showed 38.58% taking the medication at 6 hours, 35.43% at 24 hours, and 25.98% at 72 hours. The percentage of patients who elected to control their post-surgical pain Using OTC medication was the highest in IP group at 37.6%, followed by EXT at 32.4%, MGS at 31.9%, BAP at 29.6%, and PE at 24.1%.

CONCLUSIONS

The pain perception varied among patients who underwent different surgical procedures. Mucogingival surgeries and surgical tooth extraction are associated with significantly higher perceived pain compared with implant placement surgery. Implant surgery is less likely to need opioid prescriptions. Analgesic consumption was generally parallel to pain perception. A considerable number of patients elected to control the post-surgical pain using prescribed opioid medication up to 72 hours postoperatively.

Prescribed opioid medication should always be considered on an individual basis, as part of the post-surgical pain management protocol, while considering the type, severity, and duration of the surgical procedure. The findings of this study suggest that a patient would only need an opioid medication to cover the first 72 hours of postoperative pain.