

# Pain perception for implant and actual pain experienced after surgery

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**Abstract:** The aim of this review was to evaluate the pain perception for implant and actual pain experienced after surgery and success and failure of the implant. Placement of implant is generally believed to be a painful procedure which is the main reason contributing to refusal of implant hence, this study focuses to improve the acceptance of implant therapy by overcoming surgical fear.

**Aim:** A dental implant (also known as an endosseous implant or fixture) is a surgical component that interfaces with the bone of the jaw or skull to support a dental prosthesis such as a crown, bridge, denture, facial prosthesis or to act as an orthodontic anchor.

**Keywords:** Implant, dental pain, pain perception, surgery

## Introduction

An unpleasant sensation that can range from mild, localized discomfort to agony. Pain has both physical and emotional components. The physical part of pain results from nerve stimulation. Pain may be contained to a discrete area, as in an injury, or it can be more diffuse, as in disorders like fibromyalgia. Pain is mediated by specific nerve fibers that carry the pain impulses to the brain where their conscious appreciation may be modified by many factors. A dental implant (also known as an endosseous implant or fixture) is a surgical component that interfaces with the bone of the jaw or skull to support a dental prosthesis such as a crown, bridge, denture, facial prosthesis or to act as an orthodontic anchor. Implant placement is a surgical phase, hence requires administration of local anesthesia which is also an important factor of anxiety.

## Material and methods

Eligibility criteria.

Inclusion criteria: human clinical trials where dental implant was place

Exclusion criteria: in vitro studies and review articles excluded

## Flowchart 1

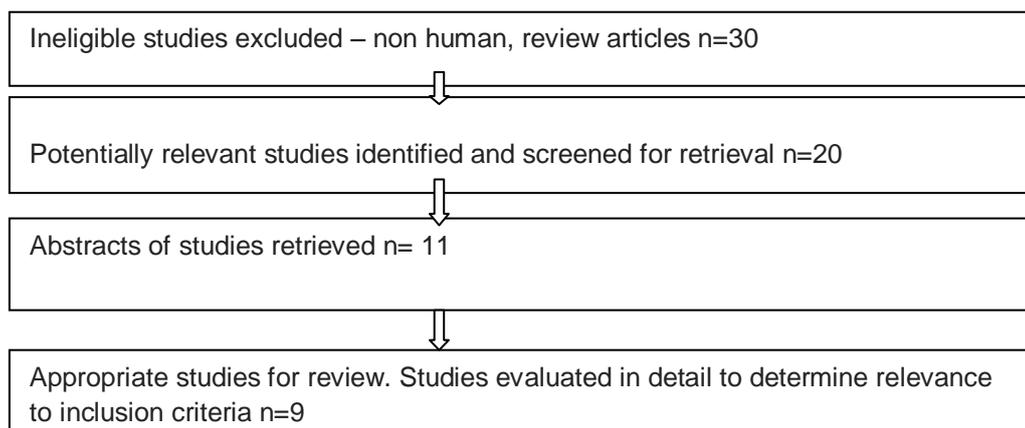


Table 1

Year of the study and design study	number of patients	method used	clinical conclusion
Sungtae Kim et al -2013 Randomized study trial(1)	89 pts	Das scaled were used  Patients completed questionnaires just before surgery (T0), immediately after surgery (T1), 1 day after surgery (T2), and 1 week after surgery (T3).	Average pain perception was highest at T2, followed by T1 and T3. analysis showed that pain perception w
Candido MC et al 2015 Randomized study trial(2)	55 patients	General anxiety (STAI) and dental anxiety (Corah-DAS) were assessed at three different time points. Appointment prior to clinical procedures (T1), day of procedures (just before the procedures; T2), and first post-procedure appointment (T3). The data were analyzed using analysis of variance followed by the Duncan test or Student's t-test.	State anxiety increased on the day of surgery (T2), whereas trait anxiety was higher at T1 .Women (n = 41) presented higher state anxiety at T2 than men (n = 14).
Fardal et all 2012 randomized study trial(3)	102 patients	visual analog scale (VAS) scores and by interview of patients undergoing implant therapy	patients with high pretreatment anxiety scores reported that and implant surgery were more uncomfortable than patients with low anxiety scores .Females recorded significantly higher anxiety scores than males
Dao j et all 2014 randomized study trial (4)	80 patients	Visual Analogue Scale (VAS) and Present Pain Intensity (PPI) Questionnaire were used to assess the pain sensation in patients immediately after the operation. According to the assessment results of STAI, the patients were divided into little or no (score range 20-37) anxiety group (L group), moderate (38-44) anxiety group (M group), and high (45-80) anxiety group (H group) to analyze the effect of state anxiety and trait anxiety levels on postoperative pain sensation.	Significantly positive correlations were found between preoperative state anxiety, trait anxiety and dental anxiety among the patients (P<0.01). Postoperative VAS score was positively correlated with trait anxiety score (P<0.01) and differed significantly between different trait anxiety groups (P<0.01). Compared with the patients in M and L groups, those in H group showed a significantly higher VAS score after the surgery

Amin Ur Rahman et al Randomized study trial  (5)	208 patients	the combined word descriptor, graphical and visual analogue scale was used to assess patient response	Patients having high expectations of pain prior to implant placement and little or no pain post-operatively. Females exhibited both more pre surgical perception of pain and actual perceived pain post surgical
Eli 2003 Randomized study trial  (6)	60 patients	visual analogue scales	Patient anxiety and pain evaluation were highest immediately before the surgical procedure (T1) with a significant decrease immediately afterwards
Hasheem 2006 Randomized study trial(7)	18 patients	A visual analog scale (VAS). To assess anxiety, patients completed the Spielberger self-evaluation questionnaire and collected salivary samples to measure cortisol levels. Saliva was collected 1 week before surgery, the day of surgery, and 3 and 6 days postoperatively. A repeated-measure analysis of variance was used to analyze pain and anxiety data.	Worst pain and limitation of daily activities were also highest on the first postoperative day; they also decreased to about half the maximum level by the second or third day. State anxiety, as evaluated by the Spielberger self-evaluation scale, was highest on the day of surgery. The salivary cortisol level did not validate this, as it did not differ with the time of collection
Sharat chandra pani et al 2014(8) Randomized study trial	47 patients	Patients filled out a dental anxiety stressquestionnaire before the procedure. Heart rate and oxygen saturation were recorded at four key intervals; in the waiting room, while seated in the dental chair, during the placement of the implant and five minutes post operatively. The patients were asked to describe their post-operative sensation of pain on a Wong- Baker facial pain scale.	Anxiety does play a role in the perception and reporting of pain by patients undergoing placement of their first dental implant, long term stress; as measured by salivary cortisol, does not. The heart rate in the waiting room seems to be the most accurate physiological predictor of pain in patients.
Muller .E et all 2001 Randomized study trial(9)	75 patients.	Data were recorded following a Pain Data Sheet designed for this particular study. The aforementioned factors were evaluated immediately before surgery and after surgery, at 24 hours	the statistical analysis indicate no correlation between pain and dental implantology procedures, in a private dental practice,Randomised study trial as significantly higher at T1 in women and for a larger number of implant placements, and at T3 when the dental anxiety score was high.

## Conclusion

This review articles includes 9 articles where different methods were used to identify the pain perception and anxiety levels and the results are tabulated in table 1.though implant was considered as a painful procedure, postoperative pain and anxiety level is associated with postoperative sensation .and thus proving that pain perception is affected by level of presurgical anxiety.

## Discussion

Implant though considered as a painful surgical procedure can have long term success rates of 93 to 98 percent for the fixture(10)(12)and 10 to 15 year lifespan for the prosthetic teeth if present in healthy tissues with appropriate biomechanical loads(12). Implant prosthesis is said to be fixed because it cannot be removed by the denture wearer (13) most implant systems have five basic steps for placement of each implant

1. Soft tissue reflection: an incision is made over the crest of bone, splitting the thicker attached roughly in half so that the final implant will have a thick band of tissue around it. The edges of tissue, each referred to as a flap are pushed back to expose the bone. Flapless surgery is an alternate technique, where a small punch of tissue (the diameter of the implant) is removed for implant placement rather than rising flaps.
2. Drilling at high speed: after reflecting the soft tissue, and using a surgical guide or stent as necessary, pilot holes are placed with precision drills at highly regulated speed to prevent burning or pressure necrosis of the bone.
3. Drilling at low speed: the pilot hole is expanded by using progressively wider drills (typically between three and seven successive drilling steps, depending on implant width and length). Care is taken not to damage the osteoblast or bone cells by overheating. A cooling saline or water spray keeps the temperature low.
4. Placement of the implant: the implant screw is placed and can be self-tapping,(14) otherwise the prepared site is tapped with an implant analog. it is then screwed into place with a torque controlled wrench(15) at a precise torque so as not to overload the surrounding bone (overloaded bone can die, a condition called osteonecrosis, which may lead to failure of the implant to fully integrate or bond with the jawbone).
5. Tissue adaptation: the gingiva is adapted around the entire implant to provide a thick band of healthy tissue around the healing abutment. In contrast, an implant can be "buried", where the top of the implant is sealed with a cover screw and the tissue is closed to completely cover it. A second procedure would then be required to uncover the implant at a later date.

There are different approaches to placement dental implants after tooth extraction.<sup>[16]</sup> The approaches are:

1. Immediate post-extraction implant placement.
2. Delayed immediate post-extraction implant placement (two weeks to three months after extraction).
3. Late implantation (three months or more after tooth extraction).

Three to six months of integrating time (depending on various factors) has to be allowed before placing the teeth on implants (restoring them). After an integration period, a second surgery is required to reflect the mucosa and place a healing abutment(17).In most of the cases the bone or soft tissue is deficient that the surgeon needs to reconstruct it either before or during implant placement (18).The dentist will work to restore the vertical dimension of occlusion, the esthetics of the smile, and the structural integrity of the teeth to evenly distribute the forces of the implants. When implants are used to retain a complete denture, depending on the type of attachment, connections need to be changed or refreshed every one to two years. A powered irrigator may also be useful for cleaning around implants. an increased anxiety level during implant surgery can therefore be reduced by proper explanation of procedures ,minimal invasive procedure that can reduce bleeding, pain and no suture and makes patient more comfortable postoperative pain .(19)

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