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The Impact of Patient Centered Care Approach on Patient's Pain Perception in Dental Procedure

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ABSTRACT

This scoping review explores the impact of patient centered care approaches on pain perception in dental procedures. By synthesizing evidence from previous studies, the review highlights the role of PCC in improving patient outcomes. The findings suggest that this holistic approach, which integrates pharmacological and non-pharmacological strategies tailored to individual patient needs, significantly reduces pain intensity, enhances patient satisfaction, and promotes recovery. Additionally, the review identifies gaps in current research and offers recommendations for future studies to further develop and implement PCC.

Keywords: Dental Procedure; Pain; Patient Centered Care

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INTRODUCTION

Patient-Centered Care (PCC) is a healthcare approach that positions the patient as the focal point of the care process, integrating their needs, preferences, and values into clinical decision-making (Mills I., *et al*., 2013). Within the field of dentistry, PCC is recognized as a critical component not only for achieving optimal clinical outcomes but also for enhancing the overall patient experience, including the effective management of post-procedural pain (Lee H., *et al.*, 2018). Pain remains one of the most frequently reported complaints following dental interventions, encompassing conservative treatments, periodontal therapy, oral surgery, and implantology (Bernabeu-Mira JC., 2018). The intensity of post-procedural pain has been shown to influence patients' quality of life, satisfaction with care, and adherence to follow-up appointments (Alfawal AMH., *et al*., 2020).

Evidence from multiple studies indicates that post-procedural pain is determined not solely by physical factors, such as the extent of tissue trauma, but also by psychological variables, including anxiety, fear, and individual patient expectations (Marconcini s., *et al*., 2019). The PCC framework, characterized by its eight dimensions (1) respect for patient preferences and values, (2) provision of emotional support, (3) attention to physical comfort, (4) delivery of information and patient education, (5) continuity and transition of care, (6) coordination of services, (7) accessibility of care, and (8) involvement of family and friends has the potential to modulate pain perception through both physiological and psychological pathways (Apelian N., *et al*., 2017; Alfawal AMH., *et al*, 2020)

METHODS

This scoping review follows the PRISMA-ScR guidelines. Literature searches were conducted in PubMed and Scopus to identify studies related to the implementation of PCC in dentistry that reported reductions in patient pain intensity. Keywords: "patient-centered care", "dentistry", "pain", and "postoperative".

Inclusion criteria:
Clinical studies or randomized controlled trials in the field of dentistry.
Reporting the implementation of one or more PCC dimensions.
Measuring pain intensity as an outcome.

Exclusion criteria:
Review articles without empirical data.
Animal or laboratory studies.

RESULTS

In this study, 568 articles were identified using the keywords "Patient-Centered Care", "Dentistry", "Dental Treatment", and "Pain". Of these, 555 articles were excluded because they did not focus on Patient-Centered Care in the field of dentistry. Articles that did not describe the impact of Patient-Centered Care in dentistry were also excluded. Review articles without empirical data were likewise excluded.

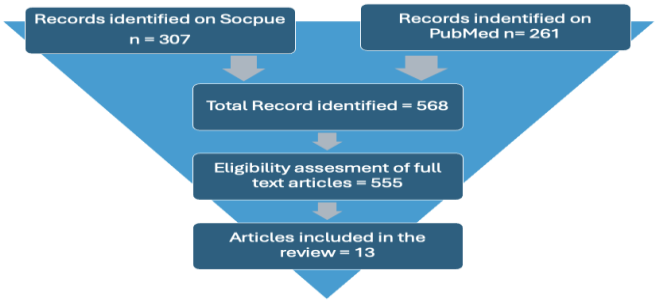


Figure 1. Prisma-Scr of this Scoping Review

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arious PCC interventions were found to reduce patient pain, such as minimally invasive surgical techniques in orthodontic corticotomy (Alfawal AMH., *et al*., 2020), low-speed drilling without irrigation in implant placement (Bernabeu-Mira JC., *et al*., 2024), the use of intravenous dexamethasone as a pharmacological adjuvant (Vieth MP., *et al*., 2022), and the application of enamel matrix derivative (EMD) in connective tissue grafting (Mercado., *et al.,* 2020).

Pre-procedural education through modified full-mouth decontamination (Marconcini S., *et* al., 2019) was reported to enhance patient comfort and reduce pain perception. Clinical team coordination in immediate occlusal loading of implants (Vogl S., *et al*., 2019) also provided a more comfortable postoperative experience.

Family involvement in decision-making for prosthetic treatment—such as the conversion of a two-implant overdenture to a three-implant overdenture (Emami E., *et al*., 2019) —was shown to support patients in managing post-procedural pain.

Tabel 1: 8 PCC Dimension in Dental Procedure

No	PCC Dimension	Case Example on Dentistry Field	Implication on Pain Inensity
1	Respecting patient choice & value	The choice of flapless implant placement technique over the flapped technique was based on patient preference; irrigation techniques that reduce the sensation of "drowning".	Respectiong patient preferences regarding procedural comfort → minimalizing patinetn anxiety → Reduced pain preception
2	Emotional Support	Minimally invasive approaches, such as laser-assisted flapless corticotomy delivered with empathy; effective communication with needle-phobic patients through the use of non-injection gel anesthesia.	Emotional support reducing stress→reducing acute pain perception
3	Physical comfortn	Low speed drilling with irrigation reducing pain and inflamation; Use of deksametason IV preoperative can reduce pain until 72 hour.	Protocol dan reducing tissue trauma and inflamation → Lower post-procedural pain
4	Information and Education	Pre-procedural education in modified full-mouth decontamination enhances comfort and reduces pain; discussion of risks and benefits of the EMD technique in gingival grafting.	Information and Education to prepare patient expectations → Pain experienced is more manageable
5	Treatment continuity and transition	Structured follow-up after periodontal and implant surgery ensures pain control; continuous monitoring in long-term implant programs.	Ongoing monitoring enables prompt intervention when pain increases
6	Treatment Coordination	Collaboration between periodontist and prosthodontist on immediate implant loading case	Team coordination minimizes repeated procedures and tissue trauma → Reducing pain
7	Access of care	Provide non injection anesthesia as an option for needle phobic patients	Access to technology and treatment options tailored to patient conditions → more effeicient procedures and reduced pain
8	Involvement of the patient's family and close relations	Discussion of prosthetic treatment plans involving the families of elderly patients.	Family support aids postoperative compliance and at home pain management

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DISCUSSION

Post-procedural pain is influenced by tissue trauma, inflammation, and the patient's subjective perception. Procedural technique modifications, such as low-speed drilling without irrigation and preoperative administration of dexamethasone, can reduce pain and inflammation. Pre-procedural education and respect for patient preferences, such as flapless implantation, provide greater comfort (Verma UP., *et al*., 2025; Bernabeu-Mira JC., *et al* ., 2024; Vieth MP., *et al*., 2022; Marconcini S., *et al*., 2020).

Anxiety and stress play a significant role in influencing pain perception. Physiologically, anxiety can activate the sympathetic nervous system, increasing the release of catecholamines and cortisol, which in turn affect pain thresholds and exacerbate pain perception (Vieth MP., *et al*., 2022; Yuan S., *et al*., 2020). Stress conditions can also heighten nociceptor sensitivity and slow wound healing, making pain feel more intense. Psychologically, anxious patients tend to focus more on pain sensations, perceive them as a threat, and experience heightened discomfort (Marconcini S., *et al*., 2019; Yuan S., *et al*., 2020). Yuan et al demonstrated that patient-centered communication effectively reduces anxiety levels during dental procedures, which correlates with decreased pain intensity.

The dimensions of emotional support, care coordination, and family involvement contribute to reducing patients' psychological burden, influencing pain perception and improving adherence to treatment (Alfawal AMH., 2020

CONCLUSION AND IMPLICATIONS

Consistent implementation of PCC has demonstrated effectiveness in reducing post-procedural dental pain intensity through a combination of physical interventions, education, emotional support, service coordination, and family involvement. The multidimensional application of PCC not only alleviates pain through physiological mechanisms—such as reducing inflammation and regulating the stress response—but also addresses psychological aspects by lowering anxiety, enhancing the sense of safety, and building patient trust in the care process. Evidence gathered from various studies indicates that PCC strategies combining minimally invasive techniques, pharmacological management, pre-procedural education, and social support can yield better clinical outcomes and patient experiences.

Limitations and Future Research

Further research employing multi-center and long-term designs is needed to evaluate the synergistic effects of implementing all PCC dimensions on pain, quality of life, and patient satisfaction. Such research should also take into account psychosocial variables, demographic differences, and specific types of dental procedures to develop widely adoptable clinical PCC guidelines. The integration of effective communication training and emotional support into dental education curricula is also recommended to strengthen the application of PCC in daily practice.

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