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Behavioral interventions may reduce dental anxiety and increase acceptance of dental treatment in dentally fearful adults

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Summary

Selection Criteria

This study involved a systematic review and meta-analysis of studies of behavioral interventions for severe dental anxiety. A search of five databases (PubMed, The Cochrane Library, Embase, CINAHL, and PsycINFO) was well as Health Technology Assessment (HTA) databases and the reference lists of relevant papers produced a total of 990 articles. Accepted languages included English, Danish, Norwegian, and Swedish, and papers published between January 1970 and August 2011 were reviewed. Eight hundred forty-eight abstracts were excluded for not fulfilling eligibility criteria, 86 more papers were excluded because they involved the wrong PICO components, and 46 were excluded because they did not meet inclusion criteria or had different objectives; were not randomized controlled trials or did not include the correct patient population; or contained duplicate information. In total, 10 articles were included in the analysis, representing 7 different trials. Each of the selected articles was reviewed by at least 3 reviewers, and an overall quality rating of high, moderate, or low was assigned to each paper based on the Swedish Council on Technology Assessment in Health Care checklist.

Key Study Factor

Studies were included if they documented severe dental anxiety using validated dental anxiety scales (Dental Anxiety Scale [DAS] or Dental Fear Survey [DFS]) or psychiatric diagnostic criteria (DSM-IV or ICD-10); examined interventions based on cognitive-behavioral treatment (CBT) or behavioral treatment (BT); included a control or placebo condition; and contained outcome measures including level of dental anxiety as measured by a validated scale, ability to complete dental treatment without use of sedative medications, dental treatability ratings, oral health-related quality of life, and complications. Randomized controlled trials (RCTs) and systematic reviews were included.

PURPOSE/QUESTION: Are behavioral and cognitive-behavioral treatments for dental anxiety more effective in decreasing dental fear compared to receiving information about dental care, completing dental treatment under sedation or general anesthesia, or placebo/no treatment in dentally fearful adults?

Main Outcome Measure

All 10 articles used the 4-item DAS to assess treatment effects, and four of the studies also used the 20-item DFS to measure dental anxiety. Six of the papers reported DAS scores at both immediate post-treatment and at follow-up. Follow-up periods ranged from 6 months to 5 years. Secondary outcome measures included acceptance of conventional dental treatment, that is, dental treatment without the need for sedative medications.

Main Results

A meta-analysis was completed on the five studies that provided sufficient data for analysis. This analysis showed a significant decrease in DAS post-treatment scores, with an average DAS difference score of 2.7. Two RCTs showed a significant decrease in DAS scores when comparing CBT/BT to anesthesia/sedation (mean difference = 2.0, $p = 0.0006$), while three RCTs showed a significant decrease when comparing CBT/BT to no treatment (mean DAS change = 3.3, $p = 0.001$). Significantly decreased DAS and DFS scores for CBT/BT compared to control were also found in studies not included in the meta-analysis. Two studies found significant differences in DAS scores after 6 months and 1 year between intervention and control groups, while two studies found no difference between groups in DAS scores at 1 year and 5 years. One study reported a significant effect of BT on acceptance of conventional (non-sedated) dental treatment compared to general anesthesia. However, the authors graded the quality of all of the studies reviewed as low to very low.

Conclusions

The conclusion of the authors is that cognitive-behavioral and behavioral therapies for severe dental anxiety in adults produce statistically significant decreases in dental anxiety as measured by the Dental Anxiety Scale and the Dental Fear Survey. There is also evidence that a behavioral therapy intervention was more effective in increasing acceptance of conventional (non-sedated) dental treatment compared with an intervention involving dental treatment under general anesthesia. However, the authors note that the quality of all the studies reviewed was low to very low, and that additional well-designed studies are needed to draw clear conclusions regarding the effectiveness of behavioral therapies in the treatment of severe dental anxiety.

Commentary and Analysis

This article reviews RCTs and systematic reviews that test the effectiveness of cognitive-behavioral and behavioral therapy (CBT/BT) interventions for severe dental anxiety in adults.¹ Studies across the last several decades have consistently found prevalence rates for severe dental anxiety at more than 10% of the adult population.^{2,3} As severe dental anxiety often leads to avoidance of dental treatment that, in turn, can have a substantial impact on oral and overall health,⁴ it is critical to understand the most effective treatments for dental anxiety. The authors concluded that while CBT/BT interventions lead to statistically significant decreases in severe dental anxiety, the overall quality of the RCTs and systematic reviews was low to very low.

At least one recent systematic review arrived at conclusions similar to those of this paper's authors. Gordon and colleagues⁵ concluded that cognitive-behavioral interventions for dental anxiety, such as cognitive restructuring and exposure with relaxation, can effectively reduce dental anxiety across modalities (e.g., group versus individual treatment, one- versus five-session interventions). However, they also note that the studies they included in their review "contained important methodological flaws which undermine the validity of their outcomes" (p. 375).

While testing the effectiveness of such interventions is crucial, it is also often difficult to obtain consistency across studies. The low quality of the studies evaluated by the authors likely comes, at least in part, through the timing of their publication. The standardization in RCTs did not begin to gain wide acceptance until 1996 with the original CONSORT statement⁶ and its revision 5 years later.⁷ Eight of the 10 studies from the current paper were published in or before 2001 and thus did not contain all of the CONSORT items required of RCTs today.

That said, there is clearly a need for high-quality behavioral interventions in the treatment of dental fear that include all of the necessary CONSORT components. As an example, a recently published RCT examined a self-paced computerized cognitive-behavioral intervention based on systematic desensitization for dental injection phobia.⁸ This study found that while this intervention did not have a significant effect on how many patients received an optional dental injection, it did significantly decrease self-reported dental anxiety. Unlike many of the studies reviewed in the current meta-analysis, this paper followed the CONSORT checklist, including all of the necessary components that Wide Boman and colleagues¹ were unable to report on in the papers reviewed.

A key to the inconsistencies across studies of behavioral interventions for dental anxiety lies in the definition of such interventions. The current paper includes studies of a behavioral therapy conducted over "an average of six sessions" (p. 227); cognitive-behavioral therapy administered over 10 weekly sessions; a one-session cognitive treatment; a 30-minute videotaped behavioral intervention; CBT and BT conducted over six sessions; comparisons of one- and five-session exposure treatments; and a single stress inoculation treatment, lasting 2.5 to 3.5 hours. Reviews by Kvale and colleagues⁹ and Gordon and colleagues⁵ reported similar heterogeneity in the studies they evaluated. While this diversity across behavioral interventions for dental anxiety provides numerous tools for treatment, it also reduces the ability to systematically test the effectiveness of such interventions.

In summary, Wide Boman and colleagues' systematic review and meta-analysis points out strengths of behavioral interventions for the treatment of severe dental anxiety, but highlights needs for high-quality RCTs and consistency across interventions. Conducting multi-site RCTs of specific behavioral protocols, perhaps on an international scale, would help strengthen the evidence available for these treatments for severe dental anxiety.

References

1. Wide Boman U, Carlsson V, Westin M, Hakeberg M. Psychological treatment of dental anxiety among adults: a systematic review. *Eur J Oral Sci.* 2013 Jun; 121(3 Pt 2):225–234. [PubMed: 23659254]
2. Gatchel RJ, Ingersoll BD, Bowman L, Robertson MC, Walker C. The prevalence of dental fear and avoidance: a recent survey study. *J Am Dent Assoc.* 1983 Oct; 107(4):609–610. [PubMed: 6579095]
3. Humphris G, Crawford JR, Hill K, Gilbert A, Freeman R. UK population norms for the modified dental anxiety scale with percentile calculator: adult dental health survey 2009 results. *BMC Oral Health.* 2013 Jun 24.13:29. [PubMed: 23799962]
4. Schuller AA, Willumsen T, Holst D. Are there differences in oral health and oral health behavior between individuals with high and low dental fear? *Community Dent Oral Epidemiol.* 2003 Apr; 31(2):116–121. [PubMed: 12641592]
5. Gordon D, Heimberg RG, Tellez M, Ismail AI. A critical review of approaches to the treatment of dental anxiety in adults. *J Anxiety Disord.* 2013 May; 27(4):365–378. [PubMed: 23746494]
6. Begg C, Cho M, Eastwood S, Horton R, Moher D, Olkin I, Pitkin R, Rennie D, Schulz KF, Simel D, Stroup DF. Improving the quality of reporting of randomized controlled trials. The CONSORT statement. *JAMA.* 1996 Aug 28; 276(8):637–639. [PubMed: 8773637]
7. Moher D, Schulz KF, Altman D. CONSORT Group (Consolidated Standards of Reporting Trials). The CONSORT statement: revised recommendations for improving the quality of reports of parallel-group randomized trials. *JAMA.* 2001 Apr 18; 285(15):1987–1991. [PubMed: 11308435]
8. Heaton LJ, Leroux BG, Ruff PA, Coldwell SE. Computerized dental injection fear treatment: a randomized clinical trial. *J Dent Res.* 2013 Jul; 92(7 Suppl):S37–S42.
9. Kvale G, Berggren U, Milgrom P. Dental fear in adults: a meta-analysis of behavioral interventions. *Community Dent Oral Epidemiol.* 2004 Aug; 32(4):250–264. [PubMed: 15239776]