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Cognitive Behaviour Therapy for Children with Dental Anxiety: A Review

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Abstract

Cognitive behavioural therapy (CBT) is a non-pharmacological technique that uses a combination of behavioural and cognitive coping skills, for behaviour guidance during dental treatment of children. It is a structured psychological treatment method, which features behaviour analysis, psychoeducation, exposure, cognitive re-structuring, assertiveness techniques, and home exercises. Although the specific components of CBT differ depending on the study design and the anxiety disorder treated, through this review we aim to review the CBT procedures (particularly exposure-based approaches) and its efficacy in paediatric dental practice. We also illustrate the outcomes of various studies that compare the traditional behaviour management techniques with CBT. It may be concluded that CBT has a higher success rate when compared to other behaviour guidance techniques, with good patient and parental acceptance.

Keywords: *Pediatric, dental anxiety, cognitive behaviour therapy, psychological.*

Introduction

Children are not merely a miniscule form of adults, but are constantly undergoing changes mentally, physically and emotionally. Psychologically, their development proceeds in a sequential manner, which is evident in their various characteristic behaviours [(1)]. Among children who come for a dental treatment, dental anxiety is often coupled with oral health problems such as untreated dental caries [(2)]. This may lead to negative corollaries such as feeling of mortification, decreased self-confidence, and absenteeism from school [(3)].

For a dentist, managing children with anxiety or behaviour problems is a dual mission: first, to treat the dental problem the child is experiencing; and second, teaching the child effective ways to manage dental anxiety[(4)]. It is known that, cognitive behaviour therapy (CBT) is useful in managing dental anxiety and phobia in adults. The technique of CBT coalesces the behavioural (desensitisation and relaxation) and cognitive (cognitive restructuring) interventions [(5)].

The principles of operant conditioning are used for behaviour therapy. Functional analysis via observing and recording the events prior to and during the occurrence of the behaviour, and the outcomes is carried out to operationally identify the behaviour to be changed. Post analysis, treatment is based upon the principles of operant conditioning theory, including positive and negative reinforcement, punishment and shaping. Caregivers are involved, to significantly raise the chance of success of the behavioural mediation [(5)].

Cognitive therapy is based on the principle that, maladaptive cognitions cause emotional distress and behavioural problems. The therapeutic strategies aim to change these maladaptive cognitions [(6)].

Assessment:

The assessment model by Williams et al [(8)] has five areas:

1. Situation, relationships and practical problems:

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Various children face practical problems in various situations, and the activities of people around them can create emotional upsets and complications.

2. Altered thinking: Unhelpful thinking styles like jumping to the worst conclusion or having negative thoughts of future may occur in anxious children.

3. Altered emotions: Emotions such as feeling low, anxiety, worry, stress, fear, panic, etc as well as having guilt or feeling of embarrassment.

4. Altered physical symptoms: Patient exhibits signs such as restlessness or inability to relax in an operatory.

5. Altered behaviour: Signs like avoidance or reducing socialising with peers could be one of the signals of depressed state of the child.

Indications: [9]

a. Depression: mild; moderate to severe (treatment with anti-depressants), relapse cases.

b. Generalised anxiety disorders, not responding to other behaviour management techniques.

c. Normal children with anticipated anxiety for a dental visit [10].

Description of the technique:

CBT aims to teach patients to be their own therapist, help them recognize their existing ways of thinking and behaviour, and provide them with the tools to modify their ill-adapted cognitive pattern. To understand the intervention, a brief understanding of the cognitive-behavioural model is essential [9].

The cognitive-behavioural model proposes that three layers of cognitive dysfunction occur in individuals struggling with social and/or psychological problems namely core belief, intermediate belief and automatic thought. Core beliefs grow early in life and represent rigid conceptions of self, others, and the universe. Individuals with negative core beliefs are likely to develop depression or anxiety compared to individuals with positive core beliefs. These can be passive and may not influence the life of a person, until a stressful situation occurs [10].

An automatic thought is a conception about others, and ourselves at certain situations that occur throughout the day. Maladaptive automatic thoughts are skewed representation of a situation, often accepted as true. CBT aids the child to become conscious of these automatic thoughts and learn to challenge, analyse and amend these thoughts [11].

Intermediate beliefs are attitudes individuals follow in their life based on conditioning. They build these attitudes by categorizing the information they receive from the world around them. These laws direct thought and affect behaviours [10].

With the concept of "C" in CBT clear, we now move on to the "B", the behaviour aspect of the model. As changes in thought and behaviour go hand in hand, by changing the direction in which a person thinks about a situation, the behaviour will also change. The therapy uses various coping approaches and techniques to relieve anxiety such as:

A. Self-monitoring: By keeping track of problems. Individuals become more conscious of the situations that appear to "activate" their anxiety.

B. Exposure therapy: Aims to diminish the fear of certain objects (e.g., injection syringe) or situations (e.g., injecting local anaesthetic) by gradually increasing the exposure to the feared object or situation. Initially, the child is asked to look at images of the scary objects or circumstances (indirect exposure) and then gradually increase the exposure until they can experience the object or feel the situation (direct exposure) and remain in contact until the anxiety level is diminshed [12].

The most essential component of this therapy is establishing a good relationship with development of trust and collaboration between patient and therapist, both working as a team. Effective communication is a key factor. A second component is gradual and controlled exposure to a hierarchy of anxiety-provoking thoughts connected to dentistry [13]. For example, if the anxiety provoking stimuli is the application of an injection, the following method can be applied [14]:

1. In the preliminary session, establishment of a good therapeutic relationship. Exposure to the syringe, towards having the needle in the mouth.

2. In the second session, repeated penetration of the mucosa, at different places in the mouth after topical anaesthesia application.

3. In the third and the fourth session, injection of anaesthetic liquid at different places in the mouth, first a few drops, then the amount is increased.

4. In the final session, further exposure is attempted; the patient's catastrophic thoughts are revaluated in connection to exposure.

Catastrophic and anxiety related thoughts that are elicited during the exposure to the anxiety-provoking situation are overcome by cognitive restructuring. This helps the patients gain adaptive perspectives and behaviour [13].

In another technique used by Shanavaz et al [19], children, caregivers and psychologist met for ten hours of CBT over a period of 11 weeks. These sessions included behavioural analysis, psychoeducation, caregiver education, access to both in vivo and videos of dental procedures, relaxation techniques, knowledge on surgical pain control and cognitive reformation. During the sessions with psychologist, patients were exposed by viewing a mini movie presenting a child going through various dental procedures. There was provision for the children and caregivers to use dental tools and materials such as a probe, cotton balls, topical gel, suction tip, and needle to exercise at home. The therapy successfully helped to improve the patient's ability to manage dental procedures, increase self-efficacy, and decrease anxiety associated with specific dental procedures.

Kebriae et al [17] elucidated another technique of applying CBT as follows:

Step 1: Establishing the rapport- during the 4 min in a playroom, children played with a drawing slate, colour pencils, clay, and play items like dolls and toy cars.

Step 2: Modelling phase- A movie of a 5-year-old child happily undergoing dental procedure with a co-operative behaviour was shown, and the emphasis was on the child's happiness during treatment.

Step 3: Use of Benson relaxation technique- With a glove puppet in the dental practitioner's hand, the Benson's breath method was taught wherein the hand of the dental practitioner was put on the child's abdomen, the child was instructed to blow it with air like a balloon, hold it for two seconds and gradually release it in about four seconds.

Step 4: Cognitive phase- Positive emotions and feeling were reinforced verbally. The dental practitioner explained to the child that by un-filling the balloon (stomach), all the fear and concern regarding dental treatment will be drained. Self-talking by means of reinforcing positive sentences was encouraged. This activity was continued in the dental operating room, during the injection of local anaesthetic, rubber dam placement and use of high-speed handpiece.

Thus, a trained dentist or a psychologist can modify the CBT intervention to suit the patient.

Comparing CBT with other techniques:

In a study by Berge et al [14], 67 children aged between 10-16-years with intra-oral injection phobia were subjected to CBT. Group I received CBT 1 week after the diagnostic interview and Group II waitlist-control group who were waitlisted for 5 weeks, post which they were transferred to the first group. The patients completed the psychometric self-report instruments in the waiting room, prior to a semi-structured diagnostic interview by a clinical psychologist. The intervention included five CBT sessions. Cognitive restructuring followed cognitive analysis of the patients' catastrophic thoughts concerning the anxiety-provoking stimulus. Behaviour avoidance test (BAT) was done to test the catastrophic cognitions and counter-productive beliefs. The CBT was adjusted to the maturation and developmental level of each individual patient. Valuations included the psychometric scales on dental fear and phobia followed by a questionnaire on cognitions, which were carried out before, after-treatment/waitlist and at one-year follow-up. There was a significant improvement in all the psychometric scores for fear and anxiety for group I, compared to group II. The BAT scores for Group I was better than that of group II. The findings were preserved at one-year follow up. It was concluded that 10-16-year-olds with intra-oral injection phobia benefit through CBT performed by specially trained dentists.

In a study by Shanavaz et al [19], thirty children aged between 7-18-years were segregated into two groups namely CBT group for ten sessions rendered by a trained psychologist and the group where treatment was done through basic behaviour guidance interventions, sedation with midazolam, or general anaesthesia. The BAT, Structured Clinical Interview for Dental Anxiety (SCI-DA) and other psychometric tests were used. The BAT scores after the procedure and at a follow-up of one year showed that children in group I tolerated dental procedures better than group II. Further SCI-DA showed that the CBT group did not match the criteria for dental distress at one-year follow-up. The other psychometric scores also showed a drop in anxiety and increased self-efficacy in group I.

Kebriaee et al [17], studied 43 children aged between 3-6 years, for comparing the efficacy of inhalation sedation with nitrous oxide/oxygen (N_2O/O_2) and CBT in plummeting dental anxiety with a control group. For the controls, behaviour intervention methods used were tell-show-do, voice control, positive reinforcement, distraction and non-verbal communication. CBT in the form of unrelated play, Benson's breathing, positive self-talk and modelling were employed. Distress level and cooperation were determined at three intervals: injection, dam placement and high-speed airotor use with anxiety scales. Both N_2O/O_2 sedation and CBT resulted in significantly lower anxiety and higher cooperation in the second visit (at all three intervals) compared to the control, with no significant difference between these two treatment methods. CBT was recommended over N_2O/O_2, as it does not require equipment, with no chance of adverse effects [17].

Parental and child acceptance of CBT:

There is limited knowledge on how the children and caregivers perceive CBT in dental practice. In a study by Shahnavaz [20] et al, children and parents were questioned on emotions, thoughts, and experiences related to CBT and the anticipated result of the therapy, as children experienced an improvement in their ability to handle the dental procedure as well as the reduction in anxiety following CBT. The results showed that children and their parents perceived CBT as a positive event.

Age, gender and ethnicity influence on the intervention:

There is a dearth of studies related to the influence of age, gender and ethnicity on the use CBT in dentistry. Most of the studies include children above the age of 10 years, as the effectiveness of the therapy depends on the cognitive development of the child [14, 21]. In a study by Morgan et al [21], recruiting participants from certain population groups, particularly male adolescent participants belonging to ethnic minority groups was challenging. This may be due to social and cultural obstacles to accepting dental distress, willingness to take part in interviews, and language difficulties.

A study by Strom et al [22] showed that, the behaviour management technique most frequently used by pediatric dentists when treating patients with dental anxiety was tell-show-do, followed by relaxation, distraction, CBT and lastly conscious sedation.

Advantages and Limitations:

CBT is a structured, problem-centric and objective-oriented behaviour guidance strategy that uses tested approaches and skills that have been used to treat anxiety disorders. Although its effectiveness in dentistry is evidence based, it requires special training by the dentist or presence of a psychologist who is adept in CBT. CBT approach may not be suitable for all children, particularly those who have poor cognitive abilities or who are unwilling to engage with the guided self-help CBT approach. For children with more severe dental anxiety, guided self-help CBT alone may not be enough and pharmacological approaches should be incorporated.

Conclusion

Research on CBT demonstrates that it is an effective treatment, which been adapted for use with children with anxiety and depression in a pediatric dental set up. Further, randomized controlled trials are required to determine the factors influencing the outcome and cost-effectiveness of CBT as compared to other behaviour guidance techniques for various age groups. It may be concluded that CBT has a higher success rate when compared to other behaviour guidance techniques with a good patient and parental acceptance.

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