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Cognitive-Behavioral and Emotional Therapy in Blood-Injection-Injury Phobia

Haifa Mami*[1,2], Wafa Abdelghafar[1,3], Hend Ouertani[4], Obaid Garouachi[4], Zeineb Alaya[1,5], Haifa Tounsi[1,5], Bassem Khattech[4]

[1]Faculty of Medecine of Tunis, University of Tunis El Manar
[2]Psychiatry department, Med Tahar Maamouri Hospital Nabeul
[3]Psychiatry department, Jebel Oust Hospital
[4]University of Monastir and Dentistry Department in Military Hospital
[5]Internal Medicine Department, Med Tahar Maamouri Hospital Nabeul

Brief Report

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***For Correspondence**

Haifa Mami, Faculty of Medecine of Tunis, University of Tunis El Manar Psychiatry department, Med Tahar Maamouri Hospital Nabeul.

E-mail: haifamami@hotmail.fr

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ABSTRACT

Introduction: Blood-Injection-Injury Phobia (BIIP) represents a major disability in the lives of patients who suffer from it. They tend to avoid medical care and examinations, which can negatively impact their overall health. Cognitive-Behavioral and Emotional Therapies (CBET) have proven to be effective in managing this specific type of phobia.

The objective of our work was to demonstrate the effectiveness of Cognitive-Behavioral and Emotional Therapies (CBET) in the management of Blood-Injection-Injury Phobia (BIIP) through the study of a clinical case

Method: This was a descriptive study concerning the management of a 26-year-old patient with Blood-Injection-Injury Phobia (BIIP). The psychotherapy took place over twelve sessions, conducted between January and June 2021. The sessions were held weekly or biweekly, with an average duration of one hour each. The therapy sessions were conducted at the Department of Dental Medicine at the Military Hospital of Tunis.

Results: Following the qualitative and quantitative assessments, psychoeducation was implemented. Cognitive work was then carried out by identifying beliefs and cognitive distortions using techniques such as the downward arrow, evidence examination, and Socratic questioning. Behavioral interventions included training in Jacobson's relaxation technique and applied tension, which were employed during both imagined and in vivo graduated exposures. By the end of the therapy, there was a clear clinical and psychometric improvement of approximately 80% across the various assessment scales used, and the patient was able to undergo wisdom tooth extraction without losing consciousness.

Conclusion: Having demonstrated their effectiveness, cognitive-behavioral and emotional therapies (CBET) should be included in the range of treatments for specific phobias, particularly blood-injection-injury phobia.

Keywords: Phobias, cognition, behavioral therapy, blood, injection, dentist

INTRODUCTION

The phobia of blood, injections, and accidents is a specific phobia that has been little studied, despite its significant medical implications (undiagnosed and untreated somatic conditions) which result in individual and social costs [1,2].

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Indeed, the symptoms accompanying this particular type of phobia can sometimes be dramatic, including signs such as pallor and bradycardia, which often lead to loss of consciousness due to activation of the parasympathetic nervous system [2,3].

This type of phobia has been especially described in the field of dental medicine, where nearly all procedures may cause bleeding or require the use of anesthetic injections. Dentists faced with patients who have this type of phobia must be able to manage it to allow dental care under the best possible conditions (without anxiety or fear) [2].

Behavioral, cognitive, and emotional therapies (BCET) have demonstrated their effectiveness in the management of blood-injection-injury phobia (BIIP) [4,5].

In this study, our goal was to demonstrate the effectiveness of this type of therapy in managing blood-injection-injury phobia in a patient within a dental practice setting.

Patient and Methods

Recruitment: Context of Patient Management

The patient, B. A., was referred to the dental medicine department of the Military Hospital of Tunis for the extraction of wisdom teeth under general anesthesia. Indeed, the patient tended to lose consciousness during every procedure, according to his treating dentist.

According to the medical history, Mr. B. A. was 26 years old, with no notable personal somatic or psychiatric history, except for an excessive fear of injections and the sight of his own blood.

The clinical examination revealed poor oral hygiene and a carious left mandibular wisdom tooth in a horizontal position, which was causing the pain he experienced.

Radiological examination (dental panoramic X-ray) allowed us to confirm the position and anatomical relationships of the wisdom tooth before scheduling its extraction.

The dental treatment plan consisted of scaling and the surgical extraction of the mandibular wisdom tooth.

Location and Frequency of Sessions

The study took place at the dental medicine department of the main military teaching hospital in Tunis, between the care unit and the office of the dentist in charge of the patient, during the months of January to May 2021.

The therapy consisted of 12 sessions, each lasting 45 to 60 minutes. The sessions were held on a weekly or biweekly basis.

Evaluation

Qualitative Evaluation

The qualitative evaluation was carried out through:

In-depth interviews that allowed monitoring the progression of target symptoms during treatment and detecting anxious anticipation as well as cognitive and behavioral avoidance processes.

The impact on the patient's quality of life, especially the disability resulting from difficulties in managing dental pain and other general medical care.

Functional Analysis:

It forms a fundamental part of Cognitive-Behavioral and Emotional Therapies (TCCE) and involves analyzing the current and past factors that trigger and maintain the problematic behavior (through a situation clearly defined by the patient and therapist), along with the associated cognitions and emotions. This process helps establish a baseline and create a dynamic diagnosis of the patient's target problem.

To assist with this, we used the SECCA framework (Stimulation - Emotion - Cognition - Behavior - Anticipation). This framework was proposed by Cottraux and Collen in 1985. It details the interactions between various elements, namely:

S: Stimulus

E: Emotion

C: Cognition

C: Behavior

A: Anticipation

The framework consists of two parts. A synchronic part (here-and-now) that studies the current maintaining factors, and a diachronic part that identifies pre-morbid factors.

The synchronic analysis focuses on a specific situation and analyzes the sequence between stimulus, emotion, cognition, and

behavior, along with the patient's anticipation and the interactions with their family and social environment.

The diachronic analysis helps structure the patient's history, including their medical and psychiatric background as well as that of their family.

Quantitative Evaluation

Throughout our study, a quantitative evaluation based on psychometric scales was conducted at two points: primarily at the beginning of therapy to establish a baseline, and at the end of therapy to assess the impact of the intervention on modifying the problematic behavior as well as the patient's cognitions.

Standardized scales in their French versions were used (the patient had a sufficient level of French and intellectual capacity to understand and respond to the scales).

The following inventories were administered to the patient:

The Phobia Assessment Scale. Cottraux J, 1993, extracted from Bouvard M. and Cottraux J., Protocols and Assessment Scales in Psychiatry and Psychology, Masson, Paris, 2005 (Appendix 1) [6,7].

The Fear Questionnaire. De Marks I.M. and Mathews A.M., 1979 (Appendix 2) [5].

The HAD scale: Hospital Anxiety and Depression scale (Appendix 3), also used during the diagnostic and evaluation phase to rule out comorbidities such as anxiety or depressive disorders [8].

Ethical Considerations and Conflicts of Interest

Informed and free consent was obtained from the patient before the start of therapy. Ethically, respect for the confidentiality of patient data, human dignity, and professional secrecy were maintained throughout the development of this thesis work, in agreement with the patient.

We declare no real or potential conflicts of interest related to the content of this thesis.

Literature Review

A methodological search was conducted for the literature review. The databases PubMed, ScienceDirect, and Google Scholar were queried using specific keywords: phobia – blood – injection – behavioral therapy – cognition.

RESULTS

Course of Psychotherapy

The course of therapy was structured into three main phases.

Course of Psychotherapy

This initial phase was dedicated to:

Taking a general medical history, including clinical background and the circumstances surrounding the onset of the condition

Establishing a psychiatric diagnosis

Conducting a functional analysis (Figure 1)

Developing a case formulation

Defining therapeutic goals in agreement with the patient and establishing a therapeutic contract

Obtaining the patient's informed consent after explaining the rationale and approach of cognitive-behavioral and emotional therapy (CBET)

Course of Psychotherapy

Various cognitive and behavioral methods were used throughout the therapy, including:

Stress management and relaxation techniques: breathing techniques and Jacobson's progressive muscle relaxation (tensing–relaxing muscle groups).

Cognitive techniques: identifying automatic thoughts and cognitive distortions, then discussing and challenging them with the patient. Techniques such as the downward arrow, evidence examination, and cognitive restructuring were employed.

Beck's cognitive model (thought records/columns) helped us, together with the patient, identify his automatic thoughts and underlying assumptions, which were then addressed in cognitive restructuring sessions.

The "downward arrow" technique was used to uncover the patient's core belief. The patient was asked to imagine the worst possible outcome in a phobic situation (in this case, a dental procedure):

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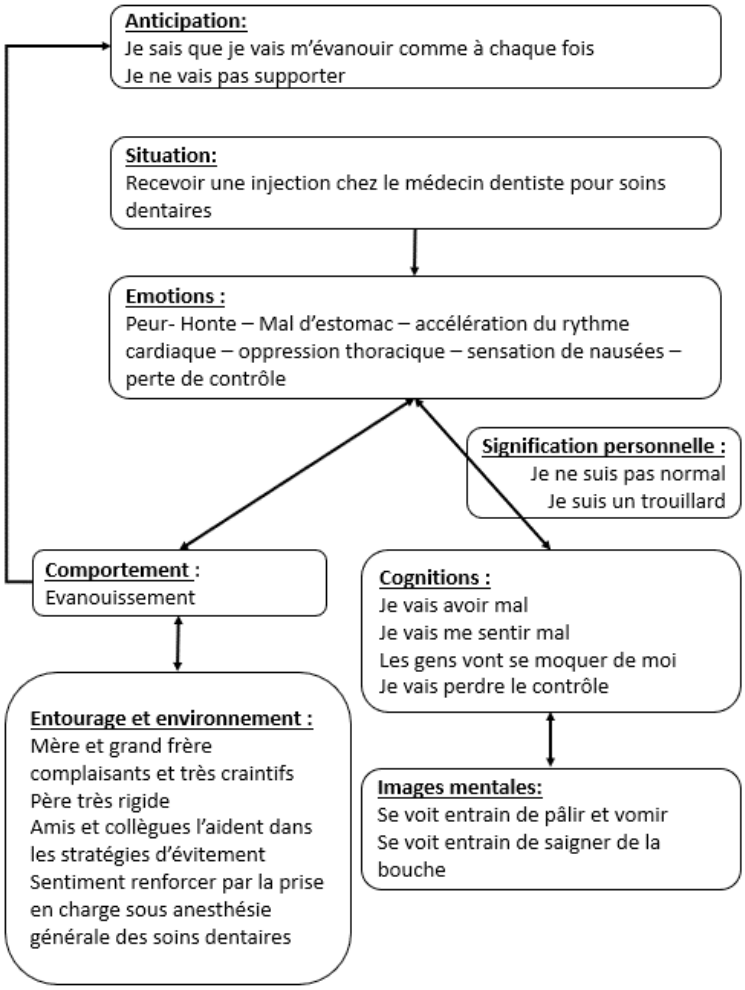

Figure 1: Synchronic functional analysis using the SECCA framework of a patient suffering from a specific blood-injection-injury phobia.

Therapist: What do you fear most in this situation?

Patient: That it will hurt during the injection. The mouth is a very sensitive area.

Therapist: And then? What might happen next?

Patient: I'll feel unwell; my body won't handle it.

Therapist: And then?

Patient: Something serious will happen to me.

Therapist: And then?

Patient: I'm a failure. I can't even handle a simple blood draw.

This led us to uncover the patient's core belief: "I am a failure."

We then challenged this belief using an evidence-based review, weighing arguments for and against it. [Table 1]

Before this exercise, the patient believed in the core belief at 90%.

After completing the table, he reduced his belief to 30%.

He concluded by acknowledging that he had accomplished meaningful things in life, that he helps many patients, and that his mother is proud of him.

Behavioral techniques were also applied: systematic desensitization, graded in-vivo exposure, and the applied tension technique, which is particularly relevant for this type of phobia.

Initially, the therapy began with behavioral work, including training in abdominal breathing. This was followed by cognitive work, focusing on identifying and modifying automatic thoughts and distortions.

Subsequently, behavioral techniques were reintroduced, including Jacobson's relaxation method and applied tension training. These were used during both imagined and in-vivo exposures, based on a hierarchy of phobic situations, progressing from the

Table 1: Evidence Examination Table with Arguments For and Against.

Arguments For	Arguments Against
I can't stand needles; I will look like a coward	Everyone can be afraid of something in their life
People will make fun of me	People are actually caring and kind to me
People judge those who are afraid of needles negatively, as if they were scared children	Even people who are afraid of dogs or other things are judged the same way; I'm not a child, I'm an adult
I haven't succeeded as an adult; I've failed in life	I'm a nursing assistant, I work, I have friends: I've done something with my life

Table 2: Hierarchical List of Phobic Situations.

Situation	Anxiety	Avoidance
Seeing my own blood	100%	Yes
Injection in the mouth	90%	Yes
Getting a blood test/vaccine	80%	Yes
Opening my mouth to receive the injection	60%	Yes
Sitting in the dental chair and seeing all the equipment including the syringe	40%	No
Thinking about receiving an injection	30%	Yes
Thinking about having a tooth extracted	20%	Yes

least to the most anxiety-inducing [Table 2].

We dedicated one session to learning Jacobson's progressive muscle relaxation technique—a method particularly recommended for blood-injection-injury phobia. This technique involves a series of tension and relaxation exercises applied to different muscle groups.

We reminded the patient of the physiological mechanisms involved in blood-injection-injury phobia, particularly hypotension as the cause of vasovagal fainting, which can lead to a loss of consciousness. We then explained the importance of the applied tension technique. This involves first learning to recognize the early signs of blood pressure drop, and then responding by contracting the muscles of the legs, arms, and chest to counteract the drop and maintain adequate brain perfusion—thus avoiding fainting. The muscle contraction should last for 20 seconds, followed by 20 seconds of relaxation.

During the same session, we trained the patient in Jacobson's progressive relaxation, which through intentional muscle contraction and relaxation, helps reduce tension, anxiety, and promotes emotional balance by acting on muscle tone and the autonomic nervous system. At the end of the session, we provided the patient with a YouTube video link demonstrating the Jacobson technique, including background music and guided instructions.

As homework, the patient was instructed to practice this relaxation technique every evening before bed, lying down. The session should begin with 3 minutes of abdominal breathing exercises, followed by 5 cycles of applied tension.

These at-home tasks were intended to reinforce the work done during therapy sessions.

Through this well-structured and codified therapeutic program, the patient gradually regained self-confidence in the context of medical care. As a result, he was able to break the vicious cycle of fear → avoidance of care → reinforcement of fear.

By the end of the therapy, we observed clear improvement in the patient's condition. Scores on the psychometric evaluation scales showed an average 80% improvement. Clinically, the patient was less anxious, had a better understanding of his disorder, and was able to manage phobic situations more effectively. He successfully underwent a dental extraction and a vaccination without losing consciousness [Table 3].

Maintenance and Follow-Up Phase

This phase involved regular clinical re-evaluation using scales and assessment questionnaires, as well as practical role-playing situations (e.g., dental extraction and procedures under local anesthesia).

Description and Structure of a Typical Session

In Cognitive-Behavioral and Emotional Therapy (CBET), sessions are structured and generally follow the same outline:

Summary of the previous session

Review of homework assignments

Agenda for the current session

Selection of a target situation and cognitive and/or behavioral work

Frequent recaps during the session with continuous positive reinforcement

Assignment of homework for the next session

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Table 3: Scores obtained from evaluation questionnaires before and after therapy.

Scale	Pre-Therapeutic Evaluation	Post-Therapeutic Evaluation	Percentage Improvement
Phobia Evaluation Scale			
- Phobia I	8	2	75%
- Phobia II	8	1	87.50%
Fear Questionnaire			
- Main Phobia	8	2	75%
- Social Phobia Score	0	0	–
- Agoraphobia	0	0	–
- Blood-Injury-Injection Phobia	21	4	80.95%
- Vaccination	8	2	75%
- Anxiety-Depression Scale	8	2	75%
- Scale of Impairment Caused by Behavior	8	2	75%
HAD Scale (Hospital Anxiety and Depression Scale)			
- Total A (Anxiety)	7	2	71.42%
- Total B (Depression)	0	0	–

Summary of the session and feedback from both the patient and therapist

DISCUSSION

In this case report, we treated Mr. B.A., who was suffering from a specific phobia related to injections, blood, and accidents.

The therapy was based on gradual exposure and cognitive therapy.

Clinically, and as reflected in the evaluation questionnaires, we observed:

A regression in anxiety associated with the phobia

A reduction in avoidance behaviors

The disappearance of anticipatory anxiety

This resulted in better oral and dental care management, as well as positive impacts on the patient's social and family life.

It is important to emphasize the crucial role of the initial treatment phase, especially functional analysis, in understanding the disorder. Providing information and psychoeducation helped give a name to misunderstood physical symptoms. It also helped the patient become more aware of his thoughts and their impact on behavior and emotions [1].

Effective gradual exposure helped the patient achieve habituation and, consequently, treat the phobia. A hierarchical list of anxiety-inducing situations, from least to most distressing, was developed with the patient. Gradual exposure exercises—both imagined and real (in vivo)—were conducted during sessions and as homework. These exposures resulted in the extinction of anxiety [1,9,10,11].

The patient's involvement, motivation, and diligence in carrying out the exercises contributed greatly to the success of the therapy and fostered a trusting relationship between the therapist and patient.

Several studies in the literature have demonstrated the effectiveness of CBET in treating blood-injection-injury phobia. A particular emphasis has been placed on dental phobia, as most dental procedures involve either anesthetic injections or sharp or rotating instruments, which are sources of anxiety-inducing noise and vibration [2,12].

For example, a 2017 study by Berge et al. on CBET for intra-oral injection phobia in adolescents aged 10–16 showed significant effectiveness. It was a randomized controlled trial involving 67 patients diagnosed with blood-injection-injury phobia according to DSM-V criteria. Those treated by a CBET-trained dentist showed significantly better outcomes than the control group [13].

A 2013 systematic review by Galvão-de-Almeida et al. assessed the impact of CBET on phobias using neuroimaging techniques. Despite technical limitations, neuroimaging provided neurobiological evidence supporting the effectiveness of CBET in treating phobic disorders and objectively demonstrated the therapy's results [4].

In our study, we identified a few limitations, notably the lack of an Arabic version of the psychometric assessment tools, which may have introduced bias, and the fact that the psychotherapeutic intervention was conducted with only one patient.

Thus, further and more in-depth research is needed in this area—especially considering emerging technologies. For example, augmented reality (AR) has shown promise in the treatment of phobias [14,15].

A randomized controlled trial studying the use of AR immersion combined with CBET in treating specific phobias among young patients on the autism spectrum concluded that this technology is helpful and can be effectively used with autistic individuals [15].

Additionally, the use of EMDR (Eye Movement Desensitization and Reprocessing) has proven effective in treating specific phobias, especially in cases linked to traumatic events, as has hypnosis, used as a desensitization technique through guided suggestions and relaxation [16].

CONCLUSION

Specific phobias are a fairly common anxiety disorder. They exist in various forms, and new types continue to emerge over the years [17].

The blood-injection-injury phobia (BII) is a particular subtype of specific phobias. It is mainly characterized by a vasovagal reaction, which often leads to loss of consciousness in affected individuals [3,18].

Cosgnitive-behavioral and emotional therapy (CBET) is especially recommended for managing this disorder. It involves the learning of habituation strategies through exposure techniques, as well as cognitive restructuring techniques aimed at reducing the impact of dysfunctional thoughts [18].

Despite the methodological limitations of our study, our work highlights the effectiveness of CBET in treating BII phobia. CBET should be considered an essential part of the treatment toolkit for specific phobias.

Dentists may frequently encounter patients suffering from this disorder in their daily practice. Proper training in CBET can help them manage these patients—once a psychiatric diagnosis is confirmed and no comorbidities are present.

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