



Successful Treatment of Halitophobia with Cognitive Behavioural Therapy: A Case Study

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Abstract

Halitophobia is a condition characterized by an excessive preoccupation with the belief of having halitosis. Cognitive Behavioural Therapy (CBT) was successfully used to treat a man in his 20 s who presented with important anxiety, avoidance and safety behaviours, isolation, and depressed mood. Progressive in-vivo exposure to fearful situations with the systematic prevention of avoidance and safety behaviours resulted in a significant improvement in the patient's anxiety and depression levels. This case suggests that CBT techniques, usually performed in anxiety disorders and in obsessive–compulsive disorder, can be adapted to halitophobia.

Keywords Halitophobia · Cognitive behaviour therapy · Case report · Treatment outcome · Anxiety

Introduction

Halitophobia is a rare psychiatric condition characterized by an excessive preoccupation with the belief that one's exhaled breath has an unpleasant odour (Toyofuku 2016). It is sometimes called “delusional halitosis”, because, during halitophobia, the belief of having halitosis is mistaken. The term halitophobia is the term used by the classification of the International Society for Breath Odour Research. In dentistry, halitophobia is classified among medically unexplained oral symptoms (Toyofuku 2016). Another medically unexplained oral symptom is pseudo-halitosis, which is different from halitophobia. In pseudo-halitosis, there is no clear unpleasant odour perceived by others and simple oral hygiene measures and education are sufficient to improve the condition. In halitophobia, there also is a lack of medical and social evidence of the presence of halitosis, but the measures usually sufficient in pseudo-halitosis are insufficient to change the patient's persistent belief about his breath odour (Yaegaki and Coil 2000).

In psychiatry, halitophobia is not included in the The Diagnostic and Statistical Manual of Mental Disorders (DSM–5) (American Psychiatric Association 2013).

Halitophobia may overlap with other psychiatric diagnoses, including delusional disorder, social anxiety disorder, obsessive–compulsive disorder (OCD), body dysmorphic disorder (BDD), and the olfactory reference syndrome (Ferreira et al. 2014). OCD, BDD, ORD and halitophobia's usual clinical presentations generally comprise obsessions, compulsions or both. The differential diagnosis between these four disorders is made thanks to the focus of the obsessions and compulsions. If the focus is one's physical appearance (including symmetry concerns), BDD is diagnosed. In olfactory reference syndrome, the focus is one's body odour. When the obsessions and compulsions focus exclusively on the possibility of having halitosis, halitophobia is diagnosed. People with OCD might have one or multiple types of obsessions and compulsions, but the criterion D of the DSM 5 diagnostic criteria for OCD clearly states that the content of the obsessions or compulsions must not be restricted to a concern with appearance in the presence of BDD (American Psychiatric Association 2013). In a similar vein, when the obsessions or compulsions are restricted to a concern with halitosis, the most accurate diagnosis is halitophobia (which might be included in the “other specified obsessive–compulsive and related disorder” category of DSM-5) and not OCD. A comorbid OCD might be considered when other types of obsessions and compulsions are present.

The relationship between olfactory reference syndrome and halitophobia is complex. Broad definitions of olfactory reference syndrome include breath odour as one of the

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odours a person might develop concerns about, while more strict definitions of olfactory reference syndrome exclude halitophobia (Begum and McKenna 2011). A high comorbidity rate (up to 75% of the cases) between olfactory reference syndrome and halitophobia was reported. (Phillips and Menard 2011). Olfactory reference syndrome has still to be disentangled from other existing disorders (Ferreira et al. 2014).

Halitophobia is not specifically included in the DSM–5 but its proximity with olfactory reference syndrome might justify a similar inclusion in the “other specified obsessive–compulsive and related disorder” category.

Compared to halitophobia, BDD and olfactory reference syndrome received far more attention, with several published reports of pharmacological and psychological treatments. For example, Cognitive Behavioural Therapy (CBT) was reported to be effective in treating olfactory reference syndrome (Martin-Pichora and Antony 2011). CBT’s efficacy is even more established in BDD (Greenberg et al. 2016; Prazeres et al. 2013). CBT has been adapted to emetophobia (fear of vomiting), which is a rare phobia resembling halitophobia and olfactory reference syndrome (Maack et al. 2013). Using psychoeducation, in vivo exposure therapy and fear hierarchy permitted important treatment gains which were maintained after 3 years of follow up. CBT has also been reported to be effective in some psychosomatic problems in dentistry like temporomandibular disorder, dental anxiety and burning mouth syndrome (Patton et al. 2007; Prazeres et al. 2013; Wide Boman et al. 2013). In contrast, there has been little research on the efficacy of evidence-based psychological interventions (e.g. CBT) for treating halitophobia. We are only aware of one study that reported that fluvoxamine can be an effective treatment for halitophobia (Toyofuku 2001). However, the authors did not specify the criteria for a good response to fluvoxamine. It is unclear which of the symptoms were reduced by fluvoxamine and if there were cases where the symptoms fully disappeared. In the following study, our hypothesis was that CBT can successfully treat halitophobia.

Method

Participants

Case History

Jack, a single black man in his 20s, was referred by the emergency department to our outpatient psychiatry department due to significant anxiety related to social situations. He was an African medical student who moved to Tunisia few months before consultation to continue his studies. He lived with roommates originating from the same African

country. Jack presented with a persistent belief that he had halitosis, accompanied by anxiety, sadness, shame, avoidance behaviours, and social isolation. He reported that he would notice having “bad breath” and started to feel preoccupied about it as soon as he woke up in the morning. He believed other people were avoiding him because of his halitosis. Jack had a good hygiene, was suitably dressed during his first interview, and there was no evidence indicating poor oral hygiene or odour. Psychiatric family history included:

- (1) Health anxiety in a brother,
- (2) Social anxiety disorder in a second brother, and
- (3) Generalized anxiety disorder in a sister.

Jack started to worry about his breath odour approximately 5 years prior to his consultation in our department, after finishing his high school. He reported that, due to the stressful and time-consuming medical studies, he had to spend the entire day at university. Hence, he started to forget brushing his teeth. Whereas, when he used to have lunch at home, he brushed his teeth subsequently. Jack stated that in his country, college students came from the richest and most educated families while he came from a poor family. He therefore considered others as superior to him. It was following a specific incident that the excessive fear of having halitosis began: two other students sat reportedly next to him and then changed their places while covering their noses. Jack concluded that his breath odour was actually unpleasant that day because he chewed “Khat” before class. “Khat” is a flowering plant that can be used as a stimulant. Chewing “Khat” is a largely common practice in Jack’s home country but he rarely did it. After that, Jack felt very ashamed and blamed himself for causing discomfort to others. Interestingly, he reported a similar incident that happened when he was 10: he was chewing “Khat” with his neighbours when an adult neighbour criticized his breath odour in public. Jack attested that after the “college incident”, the neighbour’s incident gained significance and reinforced his false beliefs that he had halitosis.

Within a few days of that last incident, he became extremely anxious and self-conscious about that potential halitosis whenever he had to talk to a person at home or at school. He experienced bodily sensations such as breathlessness, tachycardia, excessive sweating and tremor. He progressively started to avoid situations that involved talking to other people and became isolated. His intrusive thoughts included believing that he permanently had halitosis and that people would feel uncomfortable because of it and reject him. These thoughts persisted even after stopping chewing “Khat” and consulting a dentist who did not identify halitosis or any of its common causes. The dentist referred Jack to a psychiatrist. The latter considered Jack’s anxiety

to be normal and suggested it would be resolved spontaneously. Jack did not receive medication and was not offered a follow-up.

Assessment and Differential Diagnosis

In his first consultation, Jack did not report any significant physical health difficulties. He denied any alcohol or drug use. The DSM 5 diagnostic criteria of unspecified obsessive–compulsive and related disorder offered the closest match to his symptoms (American Psychiatric Association 2013). Diagnostic criteria were not met for any other past or present psychiatric disorder.

Jack experienced the fear of negative judgement and rejection in social situations, but that fear was exclusively secondary to his concerns about his halitosis. As long as people were far enough from him and not exposed to his exhaled breath, he did not face social anxiety. A diagnosis of delusional disorder (somatic subtype) was ruled out because Jack's insight into his problem was high and his beliefs were not delusional in severity. He believed his friends and family members when they reassured him that he did not have halitosis and recognized that his fear and preoccupation were exaggerated, but he was overwhelmed by his concerns shortly after being reassured.

Jack's behaviours resembled compulsions seen in OCD (see "Safety behaviours" section below) including repeatedly brushing teeth, chewing gum, and reassurance seeking. As such, a diagnosis of OCD was considered. However, the reported preoccupations specifically focused on his halitosis whereas in OCD the obsessions and compulsions are not limited to concerns about halitosis. People with OCD generally tend to have multiple kinds of symptoms over time (Martin-Pichora and Antony 2011), which was not noted in Jack's case. In addition, his social embarrassment was not due to engaging in compulsive rituals like seen in OCD. Finally, Jack did not present concerns about his body odour so a comorbid olfactory reference syndrome could be ruled out.

Outcome Measures

To record his progress in treatment, Jack completed at each session the Hamilton Anxiety Rating Scale (HAM-A) and the Hamilton Depression Rating Scale (HAM-D).

The HAM-A is a scale that is frequently used in clinical and research settings (Maier, Buller, Philipp, & Heuser). It comprises 14 items that measure cognitive anxiety (i.e., mental agitation and psychological distress) and somatic anxiety (i.e., physical complaints related to anxiety). A score comprised between 0 (not present) to 4 (severe) is given to each item. The total score of severity ranges from 0 to 56. Scores under 17 indicate "mild anxiety", scores from 18 to

24 indicate "mild to moderate anxiety", and scores from 25 to 30 show "moderate to severe anxiety".

The HAM-D is a widely used scale to measure the severity of depression in adults. It rates mood, guilt, suicide ideation, insomnia, motor activity, anxiety, weight loss, and somatic symptoms (Hamilton 1960).

It contains 17 items to be rated and 4 additional ones that are not added to the total score. These four items are only used to give more clinical information. Each item is rated on a 3 or 5-point scale, depending on the nature of the concerned item. Scores from 0 to 7 indicate the absence of depression. A score of 8–13 indicates "mild depression", 14–18 signals "moderate depression", 19–22 indicates "severe depression", and scores of 23 and beyond indicate "very severe depression."

To evaluate how strongly he believed in a specific thought, Jack was asked to choose a percentage between 0% (i.e., he does not believe the thought at all) and 100% (i.e., he believes very strongly in the thought). This method was used throughout the therapy to monitor the evolution of the strength of the false belief Jack had about his halitosis.

Case Conceptualization

Jack's presenting concerns were conceptualized based on a cognitive behavioural perspective. Some specific internal and external stimuli triggered intrusive thoughts about his breath odour. His automatic thoughts included "people are going to notice my halitosis and reject me", "people are going to feel uncomfortable because of my halitosis and hate me". Those thoughts caused anxiety, shame, and a number of unpleasant bodily sensations (such as tachycardia, tremor, sweating, breathlessness, etc...). These emotions and sensations resulted in many safety behaviours and avoidance strategies designed to alleviate anxiety. These behaviours might have succeeded in relieving anxiety in a short term but participated in maintaining the dysfunctional beliefs in the long term. In fact, safety behaviours and avoidance prevented the patient from finding out that the feared outcome does not come true, or that it is far more controllable than expected.

Triggers

Sensations like dry mouth, thirst, and hunger caused distressing automatic thoughts. External triggers were far more numerous and included talking to people from a short distance, giving presentations while sitting face to or next to others. Additional external triggers included signs of anxiety in other people ("I make them anxious"), the discontinuance of a conversation by others ("they were bothered by my halitosis"), hearing someone sniffing, hearing the

words “breath” and “halitosis” in co-workers’ or friends’ conversations.

Safety Behaviours

Over time, Jack developed some behaviours to reduce his anxiety. He spent 30 min brushing his teeth each morning, using sometimes two different toothpastes. He also used mouthwashes two or three times before going to work. Besides, he frequently sprayed his face and body with perfume and chewed gum as long as he was at work. He made sure that he always had a toothbrush, toothpaste, mouthwash, chewing gum, and perfume in his backpack before going to work. Moreover, he was constantly checking his breath odour and sought reassurance from family members and friends who always told him he did not have halitosis. He also put his hand over his mouth while talking and talked with a quiet voice. This usually reassured him but sometimes he feared they were just avoiding “hurting his feelings”.

Avoidance

Jack avoided many situations that provoked his halitosis-related anxiety. He avoided talking to roommates before brushing his teeth. He avoided eating food (like onion) that he believed could cause halitosis and making presentations as long as they involved talking from a short distance to others. The avoidance behaviours got more severe over time and Jack avoided nearly every social contact. Even the situations in which he would be in close proximity to others without having to talk were actively avoided. These impairments in his social functioning extended to his life outside of work so Jack started avoiding going out with friends, making new encounters, talking to strangers and eating in restaurants.

Course of Treatment

Empirically supported cognitive-behavioural strategies in the treatment of anxiety were employed to treat Jack (Choy et al. 2007). Behavioural strategies effective in anxiety included repeated exposure with response prevention (ERP). ERP consists in an exposure to fear-evoking stimuli combined with the prevention of avoidance and safety behaviours that reduce fear. These strategies are based on the principle of extinction and habituation (parts of the learning theory). Through repeated and prolonged exposure to situations that trigger fear, a person experiences a spontaneous and progressive reduction of anxiety (Thoma et al. 2015). Prevention of safety behaviours and avoidance reduce the urge to employ them over time. These changes usually trigger a change in patients’ cognitions since they learn that the feared outcome does not actually occur and that, over time, anxiety disappears even without engaging in certain behaviours. Other

employed techniques included psychoeducation and cognitive restructuring.

Following his initial consultation, Jack participated in 5 individual CBT sessions on a weekly basis, conducted by the first author and supervised by the second author. One booster session was offered to him one month after the end of the active treatment phase.

Results

Course of Treatment

In the first treatment session, Jack and his therapist focused on psychoeducation and describing the cognitive-behavioural model. Since Jack was sitting in front of his therapist, he was anxious and talked with a low voice. He was introduced to the different components of anxiety (cognitive, physiological, and behavioural). A conceptualization of his case was shared with him. Jack was also introduced to the concept of homework assignments and auto-observation to report the fear-triggering situations. He was given the HAM-A and HAM-D and was asked to rate his anxiety and depression weekly before each session. His initial HAM-D and HAM-A scores indicated moderate depression (HAM-D = 18) and severe anxiety (HAM-A = 27) (Fig. 1).

The second treatment session was a 100 min long session. Since Jack had just begun working in a new department, he wanted to make quick progress. First, the HAM-A and HAM-D scores were reviewed with the patient. Then, Jack and his therapist reviewed his understanding of the case conceptualization and whether he wanted to add new elements to it. He reported other halitophobic situations and spontaneously recognised that all of these feared situations were very similar from a behavioural and cognitive point of view. In fact, the same automatic thoughts (i.e., “people are going to notice my halitosis and reject me”, “people are going to feel

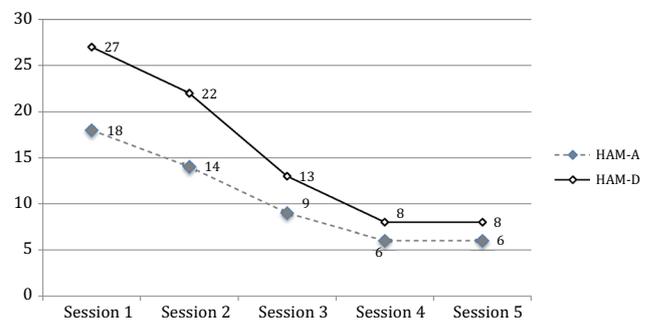


Fig. 1 The weekly progression in the Hamilton Anxiety Rating Scale (HAM-A) and the Hamilton Depression Rating Scale (HAM-D) scores

uncomfortable because of my halitosis and will hate me”) emerged in those situations and Jack had very similar safety behaviours (i.e., covering his mouth, chewing gum, etc.). He was also introduced to the ERP technique and its rationales. The principles of exposure were reviewed (e.g. that exposure works best when it is predictable, controllable, prolonged, frequent, and does not include subtle avoidance behaviours).

He reported that he felt comfortable with the way CBT worked and stated that he accepted using ERP. Then, a hierarchy of the most frequently feared situations was created. For each situation, Jack rated the degree of expected anxiety out of 100, the specific avoidance, and safety behaviour associated with the situation.

At the end of the second session, Jack elaborated a detailed strategy of exposure to the least fearful situation with the help of his therapist. He planned to go daily for a coffee with friends, stay for 2 h, and completely abandon any avoidance or safety behaviours. It was the only homework assignment. The therapist reinforced Jack, asked for his feedback about the session. Jack stated that things were way clearer to him and that he was really motivated to achieve recovery from his halitophobia.

Jack was extremely excited when he arrived at his third, 50 min, therapy session. He talked with a louder voice and reported with details his exposure experiences. He succeeded at cutting out almost all of his avoidance and safety behaviours. He was able to do daily exposures during the previous week and experienced a progressive and significant decrease in his anxiety levels. The belief that he might have halitosis was still present, with a strength of 40% as estimated by the patient. That automatic thought was evaluated and an alternative and restructured thought was elaborated during the session. Jack said: “there are not enough clues that I have halitosis, and even if it was the case it is not a problem. My dentist said it was an extremely frequent situation and people seem to want me around anyway”. Jack did not need much assistance from his therapist to challenge his initial belief. When asked how strongly he believed in his alternative thought he answered: “80%”. The exposure strategy he was going to do during the next week was then elaborated. It consisted of a daily presentation of many of his work files (in order to permit a long enough exposure) in a meeting without any avoidance or safety behaviours.

At the fourth, 50 min session, Jack reported that he felt much less depressed and anxious. He experienced minimal anxiety during his last in-vivo exposure and said that the alternative thought developed during the last session helped him. A generalization started to occur and Jack’s anxiety extinguished in numerous situations and environments that were previously problematic. Jack spontaneously compared his halitophobia to the phobia of animals. He claimed: “it is a totally disproportioned fear of a harmless situation”. The initial exposure hierarchy

was reviewed with him. There was only one last situation that was perceived as potentially fearful to Jack. Thus, an exposure to that situation was planned and assigned as homework: Jack would go once on a date with a girl, sit very close to her, and talk to her without resorting to any avoidance or safety behaviour.

At the 60 min-long-fifth session, the hierarchy of all the feared situations was reviewed and a new anxiety level was assigned to each situation. The most challenging ones (i.e., talking to someone just after waking up and going on a date with a girl and talk to her) seemed by then much easier to overcome to the patient. The belief that he had halitosis became much weaker (5% strength). The therapist reinforced Jack’s efforts and encouraged him not to engage in avoidance and safety behaviours to consolidate his therapy’s results. Jack was asked whether there were other situations that were not included in the initial hierarchy of all the feared situations and that he would like to work on. He stated that there was none. A booster session after one month was scheduled to ensure that the therapy’s results were maintained.

Outcome

Jack’s levels of depression measured by the HAM-D decreased from moderate (HAM-D = 18) to the normal range (HAM-D = 6) (Fig. 1), and his levels of anxiety measured by the HAM-A decreased from “severe” (HAM-A = 27) to “mild” (HAM-A = 8) across the course of the 5-treatment sessions (Fig. 1). The anxiety levels expected for every fearful situation is summarized in Table 1. Jack’s insight into the belief that he had halitosis also improved across treatment. The strength in his belief decreased from 80% at the start of treatment to 5% at the end of treatment.

Table 1 Initial and final expected anxiety levels of the different fearful situations rated on a scale ranging from 0 to 100%

Situation	Expected anxiety [initial (%)]	Expected anxiety [final (%)]
Talking to someone just after waking up	100	10
Go on a date with a girl and talk to her	100	10
Make a presentation while sitting close to colleagues	90	5
Sit next to colleagues without talking	70	0
Sit next to strangers without talking	50	0
Talk to colleagues during nightshifts	40	0
Talk to strangers	20	0
Sit next to strangers without talking	10	0

Discussion

The main aim of the current report was to demonstrate that halitophobia could be effectively treated using a brief 5-session CBT. Our patient's response was encouraging considering the significant reduction in his anxiety and depression levels. This case also demonstrates the importance of adapting evidence-based CBT interventions known to be effective in OCD to less known disorders of the obsessive–compulsive spectrum. A recent meta-analysis of randomized placebo-controlled trials showed that CBT is efficacious in OCD, with a stronger effect-size than in anxiety disorders (Carpenter et al. 2018). ERP is a behavioural technique usually effective in OCD and it was one of the techniques adapted successfully for our case (Rowa et al. 2007). ERP was reported to be an effective augmentation strategy in patients who did not respond to the combination of a Selective Serotonin Reuptake Inhibitor (SSRI) and risperidone (McLean et al. 2015). We also privileged ERP in our 5-sessions-therapy because evidence suggests that it may be more effective in the short term than cognitive restructuring (Rowa et al. 2007). If our patient's strength in his false belief would not have decreased quickly following exposure (i.e., dropping from 80 to 5% regarding the most important belief "I have halitosis"), we would have put more emphasis on cognitive techniques. One of the therapists' concerns that prevents the dissemination of ERP is that exposure produces high dropout rates. However, Carpenter et al. recently demonstrated that ERP has similar dropout rates when compared to other treatment conditions (Ong et al. 2016). This means ERP must be implemented whenever it is indicated, like in our case.

We are not aware of other studies that carried out psychological interventions in cases of halitophobia. Our treatment plan was globally similar to that employed by Martin-Pichora et al. to treat olfactory reference syndrome (2011). Just like in the latter case, the course of the treatment we used was based on a complete functional analysis of the case and was not strictly manualized. In both cases, ERP was the principle technique used. Nevertheless, our patient needed fewer sessions and was not treated concomitantly with a SSRI. These differences may be explained by two facts: (1) Antidepressant efficacy is far less studied in halitophobia than in olfactory reference syndrome; (2) The olfactory reference syndrome case reported by Martin-Pichora et al. seems to be particularly challenging considering the very poor insight shown initially by their patient.

Toyofuku et al. found Fluvoxamine (an SSRI) to be effective in halitophobia. They indicated that 56% of their patients showed a good response defined as a reduction of

signs after being treated for longer than 4 weeks. However, it is unclear what specific symptoms were reduced. They also considered that SSRIs might reduce the time required for psychotherapy, whilst our case demonstrated that CBT can be effective in a period of time as short as 5 weeks. In addition, patients with halitophobia might be particularly sensitive to internal cues as mouth dryness. Even if SSRIs are generally well tolerated, some anticholinergic side effects (such as dry mouth, constipation, blurry vision) may happen and complicate the course of treatment.

Establishing a diagnosis may be important to provide a context for the therapy, but, in the present case, treatment decisions were based on a functional analysis of the patient's problem comprising triggers, cues, and patterns of reinforcement. CBT's efficacy highly depends on an appropriate functional analysis and case conceptualization. This is an especially important consideration for clinicians when they face a novel presenting problem.

Similar to patients with olfactory reference syndrome, patients with halitophobia might, at least initially, believe that their problem has physical causes. They should consult dentists to determine if their halitosis is due to dental problems. They would benefit from an evaluation of bacterial activity in the mouth and a cleaning of the teeth and tongue (Rowa et al. 2007). We would recommend that the patients get a single dental consultation to rule out any physical problem but additional consultations would not be recommended. Indeed, repeated consultations would sensitize the phobia, strengthen false beliefs, and may ultimately become a safety-behaviour.

Overall, CBT is effective in OCD, but it needs more evidence when it comes to the other disorders of the obsessive–compulsive spectrum. If the disorders of the obsessive–compulsive spectrum share the same mechanisms with OCD, then elucidating the mechanisms of OCD might help better understand all disorders of the spectrum. Elucidating the mechanisms of CBT in OCD might help enhance its efficacy (Moody et al. 2017). Case studies are useful tools of clinical research since they represent a way to explore new phenomena and treatment strategies (Kazdin 1981). Still, replications of our findings in larger samples of people with halitophobia are necessary to determine whether our results are generalizable.

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Compliance with Ethical Standards

Ethical Approval All procedures performed in this study were in accordance with the ethical standards of the hospital and national

research committee and with the 1964 Helsinki Declaration and its later amendments.

Informed Consent Informed consent was obtained from the individual participating in the current study. Written consent for the release of the information was also obtained from the patient.

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