

RESEARCH ARTICLE

The Use of a Vodcast to Support Eating and Reduce Anxiety in People with Eating Disorder: A Case Series

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Abstract

Individuals with eating disorders have difficulty controlling obsessive intrusions and ritualistic behaviours relating to food and exercise. An imagery-based intervention using a vodcast (small video file played on a mobile phone or portable media device), with visual and aural components, was designed to target eating related psychopathology in a consecutive series of four patients. The vodcast was used to support consumption of a smoothie, both as a behavioural experiment and at home, in naturalistic circumstances. More of the smoothie was drunk in a shorter time when the smoothie was offered with the vodcast (mean of 218 g, SD = 64) than in the comparison condition (mean of 160 g, SD = 71). The vodcast condition was associated with reduced anxiety in three out of four patients. Three out of four patients used the vodcasts at home and found they provided them with support and motivation. All patients' weight increased after 3 months. Using a vodcast to support patients during meal times may be a useful addition to treatment for anorexia nervosa. Copyright © 2010 John Wiley & Sons, Ltd and Eating Disorders Association.

Keywords

anorexia nervosa; eating disorders; anxiety; treatment; case series

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Introduction

Although problems with eating lie at the core of eating disorders, there remains uncertainty about how these difficulties develop and are maintained. Cognitive, emotional and attentional mechanisms are thought to be involved. People with eating disorders show a small to moderate attentional bias to food words in the Stroop task (Dobson and Dozois, 2004; Johansson, Ghaderi, & Andersson, 2005) and the dot probe task (Shafran, Lee, Cooper, Palmer, & Fairburn, 2007; Shafran, Lee, Cooper, Palmer, & Fairburn, 2008). Also, there is an anomalous emotional and physiological reaction to food cues. When exposed to food and

weight cues, *e.g.* AN patients show emotional (*e.g.* fear, disgust) and vegetative (*e.g.* heart rate and blood pressure increase) arousal reactions (Leonard, Perpina, Bond, & Treasure, 1998). In a study by Friederich *et al.*, 2006, food and body image cues enhanced the startle response in anorexia nervosa patients suggesting that they had engaged the defensive systems. In contrast, patients with bulimia nervosa had a reduced startle reaction to food cues, suggesting that reward pathways had been activated. Exposure to visual or oral food cues produces activation in the limbic areas of the brain (orbital frontal cortex, amygdala and insula) in people with eating disorders, which would suggest greater emotional salience to food (Uher *et al.*, 2004;

Uher *et al.*, 2003). The overall conclusion is that there is a greater attentional and emotional reaction to food in people with eating disorders.

There are three basic elements to the central control of appetite in man: the homeostatic system which regulates body weight and metabolism, the hedonic system which is involved in the pleasure of eating and the self regulation system which sets eating into a social context. The generation of images plays a key role in the normal development of appetite and the drive to eat (Kavanagh, Andrade, & May, 2005). Individuals with eating disorders have difficulty controlling their obsessive intrusions and ritualistic behaviours relating to food and exercise. Often, these intrusions take the form of images. (Steel, Kemps, & Tiggemann, 2006; Tiggemann & Kemps, 2005). An early example was of a young woman who had an intrusion of 'putrid cats' pudding', a pathological intrusion which prevented her from eating (Gull, 1873). Thus, people with eating disorders have an imbalance between normal and pathological intrusions. This may be caused by a disturbance in self regulation, as described in a recent explanatory model from Marsh and colleagues (Marsh *et al.*, 1999).

Surprisingly few interventions for patients with eating disorders have been developed that focus directly on eating related intrusions and behaviour. A Swedish group have described the use of an instrument termed a 'mandometer', which provides computerised feedback on the rate of eating and the perception of fullness (Bergh, Brodin, Lindberg, & Sodersten, 2002). This study reported that patients on a unit that delivered this form of nutritional support did better than waiting list controls. Also, a programme of individualised exposure therapy for patients with anorexia nervosa increased food consumption and was reported by patients as being helpful (Steinglass, Sysko, Schebendach, Broft, Strober, & Walsh, 2007). The level of post meal anxiety for inpatients was reduced by relaxation techniques (progressive relaxation, guided imagery and self directed relaxation (Shapiro *et al.*, 2008). Additionally, modality-specific imagery has been found to reduce food craving (Kemps and Tiggemann, 2007). Consequently, these findings suggest that treatments with a more direct focus on eating and meal related anxiety may be of value in people with eating disorders.

We have developed an intervention that aims to restore the balance between normal and pathological intrusions in people with eating disorders. This is a

vodcast, a video developed for handheld devices, such as music and video players and mobile phones, which combines visual and aural images to support the individual to develop strategies, such as cognitive reappraisal of the anxiety related to food. Overall, the aim is to bolster self regulation.

In this paper, we describe the use of this intervention in a consecutive series of four patients with anorexia nervosa referred to the eating disorder clinic. As part of the introductory 'nutrition and eating behaviour module' from the Maudsley Model of individual treatment, patients participated in a behavioural experiment. The aim of the experiment was to examine whether the vodcast intervention would (a) reduce meal related anxiety, (b) increase the amount of food eaten and (c) be acceptable and useful in the acute presentation of food. The second part of the study was to examine whether such an intervention might be considered useful in a more naturalistic setting.

Methods

This paper is from a consecutive case series of four patients referred to a specialist eating disorders unit. The standard treatment at this unit is the Maudsley Model of outpatient care, which is a form of motivational enhancement therapy focused on the key behaviours thought to contribute to the maintenance of the disorder (Schmidt and Treasure, 2006).

Interventions

The material for the vodcast was generated from a working group of clinicians, researchers and people with a history of an eating disorder. Three versions were developed and were rated in terms of their usefulness by patients with eating disorders (current and previous) see Table 1.

Table 1 Patient ratings of utility of the various eating related vodcasts (the ratings are made on a visual analogue scale: 0 no use to 10 very helpful)

	Energy controller	Mindful eating	Motivational reflection
1	9	10	10
2	8	8	9
3	9	9	10
4	6	7	8
5	8	7	6
Average	8	8.2	8.6

Vodcast 1: Energy controller

The material in this vodcast includes imagery, relaxed, classical music and aural information and encourages the individual to take a meta-perspective and reflect on how food nourishes various bodily organs whilst watching the vodcast. The aim is to help the individual develop a compassionate approach towards their body and its needs for nutrition. The focus is on changing restricting behaviour.

Vodcast 2: Mindful eating

The aim of this vodcast is to help with dysregulated appetite control. The individual is encouraged to consider and reflect on the whole process of eating and digestion whilst watching the vodcast. The aim is to help the individual relearn and explicitly focus on the various steps of appetite control. The main focus is to reduce the fear relating to the rebound of appetite that can occur following restriction and to interrupt compensatory behaviours such as vomiting.

Vodcast 3: Motivational reflection

This vodcast encourages the individual to step back and think of the broader consequences of not eating. The aim is to help the individual to reconsider their ambivalence and the decisional balance relating to their behaviour. The main focus is on overcoming restricting behaviour that broadly encompasses all eating behaviours.

The vodcast which was most highly endorsed (*Motivational reflection*) was used for the behavioural experiment. The other meal related vodcasts were presented for use in the naturalistic phase.

Educational materials

The behavioural experiment took place within the context of the educational materials which form part of a self-help guide provided within the Maudsley Model of individual treatment for people with eating disorders and focus on the factors that maintain eating disorders. The nutritional module includes educational material describing how the brain controls appetite and eating and how these become dysregulated by eating disorder symptoms. Within this module, behavioural challenges relating to nutrition and the control of appetite are presented. The 'smoothie' behavioural experiment was

one of several experiments provided within this guide designed to change eating disorder behaviour. This behavioural experiment involves the patient planning to consume a smoothie in order to improve their nutrition. The goals for change are negotiated on an individual basis and depend on the level of risk and resources of the individual. In the case of anorexia nervosa, a common problem is severe restriction and so planning an increase in the diet and managing food related anxiety is the usual goal.

Procedure

In the first session of this module, the therapist introduced the patient to the educational materials. This formed the basis of a discussion about eating/drinking problems common to people with eating disorders. The therapist and patient together define the problematic eating behaviours, rating the importance and confidence of change in each area. The wider consequences of these eating behaviours in terms of medical, psychological and social health were also discussed at this point. Participants were then asked to record the context of their eating behaviours along with any anxiety and meal related intrusions. These were entered in a food diary for 2 days (1 week and one weekend day) each week.

In the next session, the diaries and progress with the educational material were reviewed. The procedure for the acute behavioural experiment involving the vodcast was embedded within this session. The participant was introduced to the research assistant who took them into another room. The research assistant asked them to complete the visual analogue scales (rated 0–100%) measuring the concepts of hunger, fullness, desire and the levels of intrusions. This was then followed by a 5 minute period either watching the vodcast or sitting quietly. The allocation to these two conditions was determined by random numbers in sealed envelopes generated by a computer programme held by the research co-ordinator.

The participant was then offered a choice from three bottles of different flavoured fruit smoothies. The participant was asked to consume the smoothie, as much and as quickly as they were comfortable with, within a 15 minutes period. Prior to the session, participants had been requested not to consume a large meal for 2 hour before attending the appointment, in order to reduce the confound of satiation. At the end of

15 minutes, they completed the rating scales and returned to the therapist. The therapist discussed how they experienced the procedure and continued to focus the discussion around the worksheets and educational material from the manual. At the end of the session, participants were once again asked to complete the visual analogue scales. Participants were asked to complete the food diaries during the following week.

In the next session, the diaries and progress with the educational material was reviewed. The behavioural experiment followed the same procedure as described above. In the fourth session, the participant was given graphical feedback of the results of the acute behavioural experiment. The participant was also offered a DVD containing all three 'i-eat' vodcasts to download to their own phones or i-pods. Participants were asked about the use of the i-pods in the following sessions. After 4 weeks, participants met with a different research assistant who asked them about their opinions of the vodcasts and educational material. This meeting followed the script of a semi-structured interview.

Four consecutive patients with anorexia nervosa were enrolled in this early proof of concept phase testing the intervention.

Case study 1: CD

CD was a 23 year old woman presenting with anorexia nervosa binge purge subtype. Her weight was 45 kg and height 163 cm (BMI 16.9 kg/m²). She had severe psychosocial problems from her illness which developed as anorexia nervosa at the age of 14. She had started several treatments several times but had disengaged early on. CD drank 210 g in the vodcast condition and 164 g in the control condition. She reported that she found the vodcast relaxing and she had lower levels of anxiety in this condition. CD failed to bring in her food diaries. Also, after attending five sessions, CD phoned to cancel because of illness and work commitments and failed to re-engage until 4 months later. Her weight at 3 months was 45.9 kg.

Case study 2: EF

EF was a 50 year old woman presenting with chronic treatment resistant anorexia nervosa (26 kg, 150 cm, BMI 11.5 kg/m²) which had its onset, age 13. In the control condition, she drank 120 g slowly in small sips throughout the allocated 15 minutes and in the vodcast

condition she drank 145 g. She noted that she found the vodcast very positive and interesting and her level of anxiety was reduced in the vodcast condition. In general, she recorded high levels of anxiety before, during and after each meal in the food diary with rituals associated with the preparation and consumption of food. The idea of increasing her intake was very frightening, although she did note that she had enjoyed the smoothie and added one of these into her diet each day. EF continued in treatment and her weight at 3 months was 27.5 kg.

Case study 3: GH

GH was a 24 year woman presenting with a referral from a nutritionist concerned about her weight. Her weight was 35 kg and height 170 (BMI 12.1 kg/m²). She had many of the features of restricting anorexia nervosa but had no weight and shape concerns. In her history, it appeared that people had been concerned about her weight from age 18 but she had avoided treatment. She indicated that she had never enjoyed smoothies. In the control condition she drank 99 g in 6.3 minutes and in the 'vodcast condition' she drank the entire smoothie 260 g in 10.2 minutes. Her anxiety was very low in the vodcast condition and she reported that found the vodcast interesting. GH did not record anxiety associated with meals in her diary, although she did report pressure from her parents to eat. GH continued in outpatient treatment which included both individual sessions and some joint sessions with the family. Her weight at 3 months was 39.6 kg.

Case study 4: IJ

IJ was a 20 year old man who presented with anorexia nervosa (171 cm, 47.8 kg, BMI 16.3 kg/m²) which had developed 1 year previously. In the control condition he drank the entire smoothie (260 g) in 3.2 minutes and in the vodcast condition he drank the same amount (260 g) in 2.0 minutes. His anxiety was higher in the vodcast condition than in the comparison condition. He reported that he found the vodcast interesting.

IJ recorded high levels of anxiety before, during and mostly after meals his diary. His feelings, thoughts and emotions in relation to food included the following: always wanting to eat more, inability to stop food thoughts and its consequences. He also reported feeling guilty over concerns of eating too much (subjective

overeating) with urges to exercise afterwards. IJ continued in outpatient treatment which included both individual sessions and a joint session with his family. His weight at three months was 51.4 kg.

The use of the vodcasts in the home environment

All participants were given a DVD with the three vodcasts to put on their own systems (handheld music/video players such as ipods and mobile phones) for use at home. At 2 weeks follow-up, patients were assessed on the use of the vodcasts during a semi-structured interview. Results from the interview are summarised in Figure 1, below.

All four patients rated the use of vodcasts at home as helpful. They emphasised that the sound of the voice and the music were most helpful. The voice in particular helped to identify with the material and helped them to relax. The music had a relaxing effect as well. The knowledge that the voice came from a real person made them feel comfortable. With regard to the content of the material, patients stressed the motivational nature and the positive framing of the messages in the

vodcasts. They found that positive framing of eating and nutrition was beneficial as it helped them to increase motivation and provided them with a new perspective on nutrition and eating. When asked about how they used the vodcasts in their daily life, two main routes of application emerged. First, patients used the material in meal situations, as for instance at meal time or between meals. Second, they used the vodcasts as a reminder to motivate themselves. Aspects that patients rated as not so helpful included the length of some vodcasts (e.g. mindful eating), the repetition of some pictures and messages.

Summary of changes relating to the vodcasts

Despite the small sample, summarising the results shows that more of the smoothie was consumed in the test meal (mean of 218 g, SD = 64) with the vodcast than in the comparison condition (mean of 160 g, SD = 71) and this was associated with a reduction in anxiety in three out of four cases. Three of the individuals used the vodcasts at home and found that they provided them with support and motivation. After

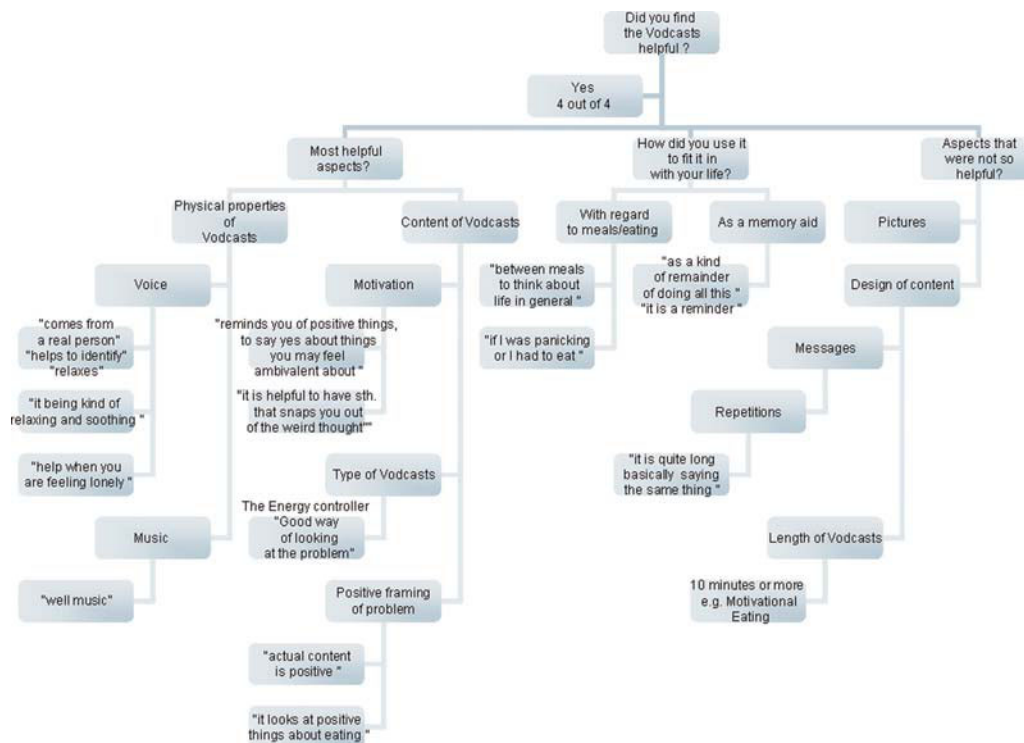


Figure 1 The main themes derived from the qualitative interview

3 months, the weight of the three participants with restrictive anorexia had increased and continued with further treatment on an outpatient basis.

Discussion

The aim of this study was to examine whether a vodcast intervention would (a) reduce meal related anxiety (b) increase the amount of food eaten and (c) be acceptable and useful in the acute test situation and in the home environment. In the behavioural experiment, in three out of the four cases, the vodcast was associated with a reduction in anxiety, an increase in the amount of drink consumed and a decrease in the time taken to finish the smoothie. In the phase involving the use of the vodcast at home, three patients used it and found it helpful. These 'high risk' patients were able to continue to make progress with outpatient treatment.

Although all of these cases fulfilled the criteria for anorexia nervosa and all were presenting anew for treatment, they illustrate the broad range of clinical cases. The three women all had a protracted course of illness. CD and EF had had several treatment episodes but had failed to respond. GH had previously avoided seeking help. IJ was seen early in the course of his illness and had started to experience cravings and subjective bingeing. He had had previous treatment for anxiety and phobias. All apart from CD had a problem with severe, restricted eating.

These behavioural experiments occurred in the context of a broader approach to treatment in which the therapists were aiming to focus on several eating behaviour goals (eating enough, with good nutritional balance, at regular intervals, in a social context with normal style and no purging). In cases EF, GH and IJ, the dominant goal was to increase the amount. All three did increase their weight and attain this goal in outpatients to variable amounts. In the case of CD, the goal was to eat regularly and to reduce vomiting. She was able to make a small amount of progress and have a day a week when she did not vomit. She also started to eat a sandwich at lunch. Although she had a period of disengagement at 3 months, she was managing to eat one meal out with her mother and not vomit, but on other days she maintained her rigid pattern of fasting until the evening, when a meal was followed by bingeing and vomiting. In the three patients with the restrictive form of presentation, the intervention appeared to be useful in a more naturalistic setting.

This was a preliminary investigation of a new form of intervention. These results suggest the importance of tailoring the treatment and intervention to the individual. The issue of motivation is highlighted by the difficulty in engaging the individual with AN binge purge form. We used the motivational vodcast for the behavioural experiment. This vodcast is targeted at individuals who are ambivalent about eating and is perhaps most appropriate for those with the restricting form of anorexia nervosa. A different form of intervention may be more appropriate for individuals with high levels of craving and the urges to eat associated with binge eating. The behavioural experiment may need to be changed for these individuals to focus more on postmeal anxiety and intrusions. A menu of alternative vodcasts with a focus on craving, binge eating and vomiting may be more appropriate and these could be used as aids to accomplish behavioural goals. It is interesting that the three people with severe restriction used the vodcast to bolster their motivation. It might be useful for the individual to make their own vodcast using information and images more relevant to them at their stage of illness.

The benefits of the proposed technology are that it is simple, discrete and mobile. It can be easily used to support eating in a variety of settings. It can be used regularly-which is an important ingredient in learning.

In conclusion, although these results are very preliminary, we consider that both the acute presentation of food and the monitoring of anxiety and intrusions may be of value when working on change in disordered eating behaviours involving severe restriction. Similarly, there is some evidence that vodcasts may be of use in supporting eating behaviour change.

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