Subliminal exposure to positive auditory stimuli effective in improving mental health wellbeing

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Key Words: Subliminal Auditory Depression Anxiety CBT Hypnosis

Running Head: Subliminal auditory stimuli as affective as conventional mental health therapies in improving anxiety and depression symptoms
Abstract
This article presents the results of a retrospective analysis of 118 patients with symptoms of depression and anxiety who were treated with eight 30-minute sessions of subliminal, sub-threshold verbal affirmation messages, both with and without music overlay. We found that seven sessions of the 30-minute treatment protocol significantly reduced self-reported symptoms of anxiety and depression in patients both in the short term (immediately following the seventh session) and long term (in follow-up sessions), as detailed in an 87-item questionnaire before and after treatment. Positive results were measured as early as after just one session. We compared the findings from this technique (termed Quantum Neuro Recoding QNR) with the results from conventional mental health therapies from published meta-analyses of a variety of mental health treatments, including medication and/or counselling, cognitive behavioral therapy (CBT) and alternative therapies. Our results show that QNR was at least as effective as CBT and counselling, with and without medication. The results presented in this article provide evidence for the potential efficacy of using repeated subliminal auditory stimuli to treat patients with symptoms of anxiety and depression and improve mental wellbeing.

Introduction

The most prevalent mental health disorders in the world include anxiety disorders, affecting 18.1% of the population, or 40 million adults in the US according to the Anxiety and Depression Association (ADAA 2016). Anxiety disorders, encompassing phobias, social anxiety disorder, panic disorder, generalized anxiety disorder, obsessive-compulsive disorder (OCD) and posttraumatic stress disorder (PTSD), very commonly co-occur with depression, bipolar disorder and schizophrenia. According to the World Health Organization, one in four people in the world will be affected by mental disorders at some point in their lives, with anxiety and depression being among the leading global causes of disability. Worldwide, these disorders affect hundreds of millions of people: 300 million people suffer from depression, 300 million from anxiety and 60 million people from bipolar disorder alone (World Health Organization, 2001, 2017).
Treatments for these common mental illnesses vary according to diagnosis and severity, but typically include medication, counseling and behavioral interventions, with varying degrees of success. Although there are effective treatments available for some mental health illnesses, relapse rate can be high, and a large percentage of people do not receive adequate treatment. (World Health Organization, 2017). According to the WHO, between 50% and 65% of people in high-income countries receive treatment, and less than 24% of people with mental disorders in low- to middle-income families receive treatment. Therefore, alternative cost-effective strategies for managing these disabling disorders and for cases resistant to treatment are urgently needed.

Common mental disorders refer to two main diagnostic categories: depressive disorders and anxiety disorders (WHO, 2017). In this study, we analyzed the effect of subliminal, sub-threshold verbal affirmation messages in a case series of 118 patients with symptoms of anxiety and depression who sought treatment at the Brain Wellness Spa in Perth, Australia. The method used was developed over a period of ten years to help alleviate symptoms in patients, many of whom had tried conventional pharmaceutical and psychotherapeutic treatments which were unsuccessful over the long term.

Just how effective are conventional treatments? Many studies have examined the effectiveness of treatments of common mental health illnesses, including a wide range of pharmacological, behavioral and care management approaches. According to World Health Organization analysis (2017), pharmaceutical and psychosocial therapies for depression, panic disorder, bipolar disorder and schizophrenia overall result in a maximum of 50% improvement over no treatment at all, and none result in a complete cure.

In a review of treatment modalities for anxiety disorders, Bystritsky et al (2013) note that “the presence of comorbidities is a rule rather than exception,” and that it is common to find symptomatic overlap and more than one diagnosable disorder in a patient, complicating the
diagnostic and treatment assessment. In addition, the authors note, different disorders can emerge over a patient’s lifetime; for example, presenting initially as panic disorder, which following treatment may reappear with another diagnosis such as GAD or OCD. This suggests common underlying mechanisms of development for many anxiety disorders, which therefore potentially require similar treatment (Bystritsky et al, 2013).

There is significant literature on the efficacy of various treatments for depressive and anxiety disorders, although there are difficulties in true comparison of effectiveness because of the wide heterogeneity between study parameters, screening procedures, sample populations and outcome measurements. Barth et al (2013) used network meta-analysis (integrating direct and indirect evidence from randomized, controlled studies) to compare the effectiveness of seven psychotherapeutic interventions in 198 studies, including 15,118 adult patients with depression, panic disorder and GAD between 1990 and 1998. Of the seven treatments – interpersonal psychotherapy, behavioral activation, cognitive behavioral therapy, problem solving therapy, psychodynamic therapy, social skills therapy and supportive counseling – the study found interpersonal therapy to be significantly more effective than supportive therapy. Although all seven therapies were found to be better than no treatment at all, cognitive-behavioral, interpersonal and problem-solving therapy were found to be the most beneficial, due to larger testing size, and being used more often in studies. Patient age and size of therapy group did not significantly affect results. The study found that psychotherapeutic treatments for depression and GAD had very effective short-term effects, but that the majority of patients did not improve in the long term. Patients with panic disorder, on the other hand, responded very well in both the short- and long-term to psychotherapeutic treatment (Barth et al, 2013).

Anxiety and depression symptoms are commonly treated with SSRIs or selective serotonin reuptake inhibitors, such as fluoxetine/Prozac, sertraline/Zoloft, escitalopram/Lexapro and paroxetine/Paxil, which stabilize serotonergic pathways (Bystritsky et al, 2013). Tricyclic antidepressants or TCAs are norepinephrine reuptake inhibitors such as clomipramine can also be prescribed for OCD, anxiety and/or depression. Benzodiazepines are prescribed for anxiety, but have worrying side effects such as potential addiction, impaired coordination/cognition,
and withdrawal symptoms. A variety of other medications are also commonly used to treat anxiety and depression. Many placebo-controlled clinical trials have indicated the clear efficacy of using antidepressant medication to treat patients with depression (AHCPR, 1993). However, the results are not curative, with frequent incidence of recurrence once medication is stopped. Several studies have questioned whether antidepressants really have any significant long-term effect greater than placebo (Turner, 2008; Fournier, 2010)

Cognitive–behavioral therapy or CBT has been shown to be successful in the treatment of anxiety disorders, both with and without prescription of SSRIs, although the combination has shown different results according to the type of anxiety disorder (Bystritsky et al, 2013). A meta-analysis review study (Roshanaei-Moghaddam, 2011) found that patients with depression or social anxiety were more responsive to medication than CBT, but patients with panic disorder were more successfully treated with CBT than with medication. In addition, the authors note that CBT may be more effective in preventing relapse. Novel treatments such as meditation alone and mindfulness-based cognitive therapy (which focuses on acceptance) have also been shown to have a positive effect and to help prevent relapse (Kabat-Zinn et al, 1992; Teasdale et al, 2000).

Given the high possibility of symptom recurrence, and in an effort to find alternatives that do not have medication side-effects, researchers are increasingly focusing on alternative therapies. Studies that have focused on the effect of subliminal visual and auditory stimuli on the cognition of patients who suffer from a variety of psychiatric conditions (e.g. Murphy and Zajonc 1993; Hartikainen et al. 2000; Banse et al. 2001; Fazio and Olson 2003; Gray 2001) found significant behavioral results, correlating to physiological changes in the brain. Functional magnetic resonance imaging (fMRI) studies have traced significant difference in levels of amygdala excitation following subliminal visual stimuli between patients with depression and normal patients, as well as between patients with different types of depression (Phillips et al. 2004; Grotegerd et al. 2013). The underlying mechanism of action has been proposed to be direct neural relay of auditory information to the amygdalae followed by the visual cortex (LeDoux 1996), producing an unconscious response to stimuli (Damasio 2010).
A few studies have analyzed the longer-term effects of subliminal suggestion when familiar stimuli (e.g. single words) were used (Naccache et al. 2005; Ocampo 2015). Ruch et al. (2016) observed that visual and verbal subliminal information affected conscious decision-making equally after 15 mins and after 25 mins, providing evidence for longevity of the effect. The authors hypothesized that subliminal messages consisting of multiple items that require relational processing undergo long-term storage in the hippocampus, which has been found to play a key role in memory-retrieval of subliminally presented information (Duss et al. 2014; Züst et al. 2015). In fact, according to Dijksterhuis et al. (2006), decisions made in the absence of attentive deliberation may be better than those made through conscious deliberation, possibly because a larger amount of information can be processed subconsciously than consciously.

Several analyses suggest that individuals diagnosed with anxiety have an unconscious attentional bias to processing negative information presented subliminally, likely mediated by unconscious cognitive processes (e.g. Mogg et al. 1993; Mayera and Merckelbacha 1999; Lin et al 2007). Patients suffering from anxiety who are presented with the subliminal affirmation sentences, “Mommy and I are one” (Silverman and Weinberger 1985) and “Mommy and I are alike” (Orbach et al. 1994) showed significant improvement in anxiety symptoms in comparison to controls.

To our knowledge, there have been no studies on the effect of subliminal auditory affirmative scripts of multiple sentences lasting 30 minutes on patients presenting with symptoms of anxiety and depression. In the present study, we analyzed whether subliminal affirmation scripts, delivered in eight 30-minute sessions, could potentially reduce emotional distress, and improve mental well-being in such patients. We then compared our results with those of other commonly used therapies.
Method

Participants
In this study, 118 subjects were included: 45 males, 73 females, ranging in age from 7 to 59 years of age, and a mean age of 35. This was a random sampling of patients, from a wide range of backgrounds and occupations, who presented themselves for treatment at the Brain Wellness Spa, Perth, between January 1 and June 20, 2017 for symptoms of anxiety and/or depression. The group included students, teachers/instructors, business owners and managers, pharmacists, nurses, doctors and veterinarians, social workers, mental health workers, construction workers, army personnel and unemployed patients. All patients provided informed consent, and prior to receiving treatment, each patient underwent a detailed medical history assessment.

Primary Outcomes
The primary indicator of patient symptoms was a self-administered 87-point questionnaire on their emotional and psychological state, completed both before and after treatment. Subjects were asked to rate the following before the first session and after their seventh session (before the eighth and final session):

- 22 negative feeling indicators: stress, anxiety, depression, feeling flat, moods, tension, worry, confusion, loss of clarity, fatigue, fear, grief, insomnia, anger, aggression, jealousy, negative thoughts, sadness, emotional reactivity, hate, negative attitudes and negative thinking. Patients were asked to choose the level of each indicator from a scale of 1 to 10, 1 being mild symptoms, and 10 being severe symptoms.
- 29 emotional well-being indicators: Patients were asked to rank themselves on each question on a scale of 1 to 5, with 1 being low, and 5 being high. For example, 1 – “I feel as though I worry constantly” to 5 – “I leave the worrying to others”.
- 10 indicator feelings: loneliness, feeling isolated, unhappiness, desperation, being unable to cope with life, hopelessness, being unloved, being unwanted, giving up on life
and never being able to have a better life. Patients were asked to choose Yes or No to these questions, with “Yes” indicating unhealthy perceptions.

- **12 questions on long-term state**, for example: “Do you constantly worry about money?” and “Do you experience mental exhaustion from going about your daily life?” Patients were asked to choose Yes or No to these questions, with “Yes” indicating patient inability to psychologically and emotionally cope with their life.

In addition, to gauge patient’s responses to the first session review, 11 questions were asked before the first treatment session and after the first treatment session:

- **11 indicators**: For example, “Do you feel sad?” Patients were asked to choose Yes or No to these questions.

**Procedure**

**Assessment**

All patients were treated as part of the routine service at the Brain Wellness Spa in Perth. Patients completed the questionnaires in the Primary Outcomes session to monitor levels of anxious rumination and emotional state. They also completed questionnaires on their personal history, medical history, prescription and other drug use immediately before the first treatment session. Patients completed the same Primary Outcomes questionnaires immediately after completion of seven sessions of treatment, and before the eighth and final session. Follow-up meetings were also conducted.

**Treatment**

In this study, we used the subliminal presentation of sub-threshold verbal suggestion stimuli, that is, stimuli attended to by the brain, but without conscious perception. Each patient received a series of eight individual treatment sessions over a period of several weeks. Treatment followed the same protocol for all patients. Each Quantum Neuro Recoding (QNR) session included subthreshold auditory information lasting 30 minutes in length, with and
without music overlay using noise cancelling headphones. Patients were sitting or lying down, with some falling asleep during the process.

The text used for the subliminal therapy sessions is proprietary, developed over a period of ten years, and was designed to help patients in eight stages. In session 1, patient feelings of suffering and being overwhelmed were addressed. In session 2, negative beliefs and values were targeted. Session 3 involved addressing childhood insecurities, trauma and fears. In session 4, patients were assisted in developing healthy perceptions. Session 5 targeted default patterns of behavior from conception, and session 6 worked on genetic mental illness and money stress. Session 7 aimed to modify emotional patterns, and the next step, in session 8, was to lock in new behaviors.

Analysis
Descriptive data are reported here as mean, standard deviation, number, and percentage change. Comparisons of data were calculated using t-tests, as appropriate. P values less than 0.05 were considered to be significant. All analyses were carried out with SPSS software (Armonk, IBM Corp, NY, USA). Three sets of data were analyzed – we hypothesized that patients would report:

1. Significantly lower levels of negative feeling indicators after seven sessions of subliminally presented affirmative auditory information than before the sessions.
2. Significantly higher scores on mental well-being parameters after seven sessions than before.
3. Significantly lower self-reported levels of anxiety and depression after the first session of subliminally presented affirmative auditory information than before.

The null hypothesis would be no observed difference in any of the three sets of means.

Results
Paired sample T-tests of mean levels of negative feeling indicators (on a scale of 1 to 10, 1 being mild symptoms, and 10 being severe symptoms) in patients before and after seven treatment
sessions, confirmed significant decrease in means before and after sessions ($d=4.36$, Table 1, Figure 1). Paired sample T-tests of mean levels of 29 mental well-being indicators (from 1=low to 5=high) in patients before and after seven treatment sessions, confirmed significant higher scores after sessions than before ($d=5.37$, Table 1, Figure 3). Patients also self-reported ($1=\text{Yes}$, $0=\text{No}$) significantly lower levels of anxiety and depression (in response to 11 session review queries) before and after just one treatment session ($d=6.75$, Table 1, Figure 2).

There was a 73.4% decrease in negative feelings and a 67% increase in patients’ self-reported sense of mental well-being following 7 sessions (Table 1, Figures 1 and 2). In addition, patients self-reported a 93.6% decrease in anxiety and depression levels in response to 11 questions before and after the first session alone (Table 1, Figure 3). These results confirmed our hypothesis of significant improvement ($P \leq 0.05$) in 118 patients’ symptoms and mental health well-being following subliminal affirmation sessions. The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Table 1. Paired-sample T-tests of mean levels of indicator feelings in patients, before and after treatment sessions.

<table>
<thead>
<tr>
<th>Patient diagnosis</th>
<th>Negative feeling indicators (n=22)</th>
<th>Emotional well-being indicators (n=29)</th>
<th>Response to first session indicators (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>1=mild symptoms, 10=severe symptoms</td>
<td>1=low to 5=high</td>
<td>1=Yes, 0=No</td>
</tr>
<tr>
<td>Treatment stage</td>
<td>Before first session</td>
<td>After 7th session</td>
<td>Before first session</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>1.44</td>
<td>After 7th session</td>
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<tr>
<td></td>
<td>SD</td>
<td>0.41</td>
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<tr>
<td></td>
<td>95% CI</td>
<td>1.27, 1.61</td>
<td>2.22, 2.50</td>
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<tr>
<td></td>
<td>4.90, 5.92</td>
<td>2.22, 2.50</td>
<td>3.88, 4.00</td>
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<tr>
<td></td>
<td>Cohen’s d</td>
<td>5.37</td>
<td>6.75</td>
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<tr>
<td></td>
<td>Pearson Corr.</td>
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<td>0.78</td>
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<tr>
<td></td>
<td>T Stat</td>
<td>-31.36</td>
<td>17.20</td>
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<tr>
<td></td>
<td>P(T&lt;=t) two-tail</td>
<td>1.08E-15</td>
<td>8.90E-23</td>
</tr>
<tr>
<td></td>
<td>t Critical two-tail</td>
<td>2.08</td>
<td>2.05</td>
</tr>
<tr>
<td>Percentage change</td>
<td>73.38%</td>
<td>66.95%</td>
<td>93.59%</td>
</tr>
</tbody>
</table>
Figure 1. Self-reported change in 22 negative feeling indicators (rating is from 1=mild to 10=severe) in 118 patients before and after seven sessions (standard deviation shown in bars).
Figure 2. Self-reported change in 29 well-being indicators (rating is from 1=low to 5=high) in 118 patients before and after seven sessions (standard deviation shown in bars).
Figure 3. Responses to 11 questions (1=Yes, 0=No) by 118 patients before and after first session (standard deviation shown in bars).

Discussion

Despite skepticism from the public, clinicians and biomedical researchers, research studies continue to provide evidence for the significant short- and long-term impact that various types of subliminal information can have on physiological and behavioral processes (van Gaal et al. 2012; Hassin 2013), including changes in mood (Monahan et al. 2000) and motivation (Aarts et al. 2008). It is interesting to note that observed effects of subliminal information have been reported to last longer when stimuli are presented multiple times (Levy et al. 2014; Farooqui and Manly 2015).

In this study, we found that patients showed significant improvement in symptoms of depression, anxiety, and in overall well-being in self-reported questionnaires following seven sessions of 30-minute long subliminal auditory therapy (Figures 1 and 2, Table 1). Positive results were noted as early as after one session of therapy (Figure 3, Table 1). Follow-up
sessions with patients confirmed these results as long-term – a suitable area for a subsequent study. Our findings add to increasing evidence for the ability of the unconscious brain to internalize, integrate and remember stimuli, and utilize this information in conscious behavior, affecting mood, emotion and decision-making in the short and long term (Monahan et al. 2000. Reuss et al. 2011).

In its report *Investing in Mental Health* (2017), the World Health Organization reported on success rates across the globe with a variety of treatments for depression, panic disorder, bipolar disorder and schizophrenia. The report noted an up to 15% placebo effect, and a general improvement in disability of up to 20% with medication, and around 20% with psychotherapy. Overall rates reached a maximum of 45% improvement in disability.

![Graph](image)

From: *Investing in Mental Health*, World Health Organization 2017

In a meta-analysis comparison of the efficacy of cognitive therapy vs. medications for depression, DeRubeis et al (2008) found a 25% placebo effect, and no discernable difference between CT and medication efficacy, with 58% of patients in both groups responding to treatment after a period of 16 weeks. After a period of two years following treatment, relapse rates for patients who responded to initial treatment were over 90% for the placebo group,
between 70% and 80% for the medication group and 50% for the cognitive therapy group, indicating that cognitive therapy was most effective treatment.

A recent randomized clinical trial of cognitive behavioral therapy (CBT) versus acceptance and commitment therapy (ACT) for mixed anxiety disorders (Arch et al, 2012) found that 12 months after CBT and ACT treatment, 52.2% and 52.6% of patients (respectively) improved on at least 2 out of 4 anxiety-specific outcomes. Similarly, for depression, Khan et al. (2012) conducted a systematic review of comparative efficacy of treatments for depression, including antidepressants, psychotherapy, combination therapies, alternative therapies and intervention controls, and found a placebo effect between 35% and 40%, and between 40% and 53% success rates for the 5 therapies (blinded clinical trials).

Although it is difficult to draw direct comparisons with treatment success rates from other studies given considerable heterogeneity in study design, patient population and positive outcome criteria, our findings of significant decrease in anxiety and depression symptoms (by 73%) and improved mental health wellbeing (67%) in our cohort of 118 patients shows that the repeated subliminal affirmation sessions were at least as successful as many current treatments for anxiety and depression. Our findings illustrate the potential clinical efficacy of using subliminal manipulation to improve long-term well-being and the emotional state of patients with symptoms of anxiety and/or depression.

Ethical approval
All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.
References


