

# Comfort Talk®

Transforming the experience of pain and anxiety in clinical settings

Dr Elvira Lang – founder of Comfort Talk® – and colleagues, developed a mobile self-hypnotic relaxation app to improve pain and anxiety management in clinical settings. The app has been developed based on previous findings from Dr Lang's team showing that specific word sequences can be used to improve patients' experiences in clinical settings. The results of their placebo-controlled clinical trial show that the self-hypnotic relaxation app is effective in reducing pain and anxiety in patients through short listening times in the waiting room. This app could therefore be used to improve patient experiences and outcomes in a range of different clinical settings.

Pain and anxiety are some of the most common and distressing symptoms experienced by patients in all clinical settings. These symptoms are frequently experienced before a medical/dental procedure takes place, as well as during the procedure. Dental waiting rooms have one of the highest levels of patient anxiety, with 9–42% of patients experiencing anticipatory anxiety.

Pain and anxiety are closely connected to one another. Research by Dr Elvira Lang and colleagues found that patients with higher preoperative anxiety tend to experience greater procedural pain than those with lower preoperative anxiety. As well as increased pain, Dr Lang and colleagues discovered that anxiety can have further detrimental impacts on patients' attendance for medical procedures, and willingness to complete their medical examinations.

Anxiety is more common in times of health scares, such as the COVID-19 pandemic. Therefore, understanding the effects of anxiety on pain, and how to minimise this, becomes even more important.

## MANAGING PAIN AND ANXIETY

Most clinicians rely on narcotics and sedative drugs to manage patient pain and anxiety. However, these methods are not necessarily the most effective, and in some cases they can lead to severe adverse effects. Non-pharmacological interventions are increasingly being recognised as a safer alternative for reducing pain and anxiety during medical procedures.

In an esteemed *Lancet* publication, Dr Lang and colleagues found that guiding patients in self-hypnotic relaxation

had more pronounced benefits in reducing pain and anxiety than using drugs. Randomised clinical trials supported this by showing that reading a short self-hypnotic relaxation script right before a medical procedure improves patients' pain and overall experience of the procedure.

Dr Lang and colleagues also showed that the use of hypnosis and relaxation-based word sequences by medical staff improved patient satisfaction, attendance, and operational efficiency. Based on these findings, the researchers aimed to investigate whether these tried-and-tested word sequences could be used to reduce pain and anxiety using a self-hypnotic mobile app.

## MOBILE APPS

Mobile apps are an increasingly popular method of offering psychological interventions. For example, there are over 103,000 apps that offer management of pain and anxiety, and 1,500 of these alone are hypnosis-based apps. Despite this explosion of emerging mobile apps, research-based evidence for their effectiveness in reducing pain and anxiety is scarce.

When determining the effectiveness of a clinical treatment it is highly desirable to compare it to a placebo, to ensure that any improvements in symptoms can be attributed to the treatment and are not simply caused by distraction or extra attention. This greatly complicates clinical trials of apps since their mere looks and functionality can have effects on the target outcomes. In other words, the use of the smart phone itself might be working to soothe a person's anxiety, and not the individual app. Due to these practical constraints, placebo apps are rarely used in practice to test app effectiveness. This limits the conclusions that can be drawn

about the effectiveness of the majority of apps.

## THE RESEARCH

Improving upon existing mobile apps, Dr Lang and colleagues aimed to develop an evidence-based mobile app to effectively reduce pain and anxiety in clinical settings. To enable a placebo-controlled trial, the researchers developed two apps, a self-hypnotic relaxation app and a placebo app which was identical in its looks and functions to the treatment app but with an intended neutral content. This was done to ensure that any changes in pain and anxiety could be specifically attributed to the treatment.

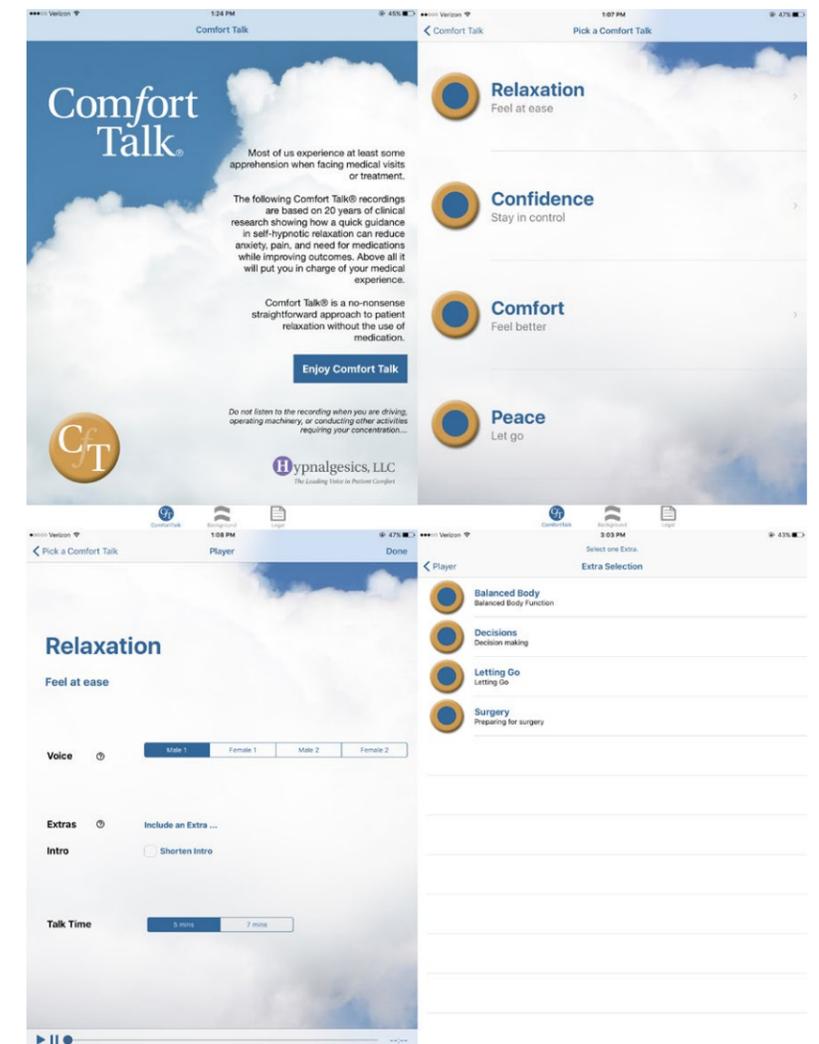
The self-hypnotic relaxation app was based on large-scale clinical trials by Dr Lang and teams. The trials used invasive procedures and MRI with over 125,000 patients. The trials revealed that when medical personnel used specific supportive word sequences with elements of relaxation, self-hypnosis, and reframing of distressing thoughts, the patients had less pain, anxiety, need for medication, and medical complications. The word sequences also led to greater efficiency of the medical procedures and overall patient satisfaction. Based on their findings, Dr Lang and colleagues integrated these word sequences into their self-hypnotic relaxation app.

## THE COMFORT TALK® APP

The app begins with a description of self-hypnotic relaxation, and some exercises to ease patients into a relaxed state. Then, using the tried-and-tested word-sequences, the app covers four main topics: relaxation, confidence, comfort, and peace. The app was also designed to provide individualised content based on a patented algorithm.

The team's app study was conducted with patients in the waiting room of a dental facility, which have higher rates of patient anxiety. Patients were asked to rate their pain and anxiety before and after using the app in the waiting room. Seventy-two patients were randomly assigned either the self-hypnotic relaxation app or the placebo app.

Using statistical analyses, Lang and colleagues found that there was a



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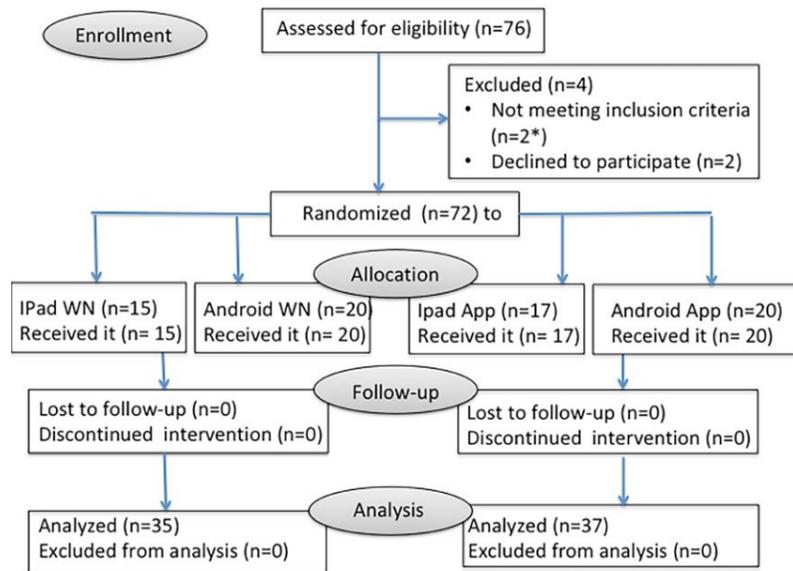
**Pain and anxiety are some of the most common and distressing symptoms experienced by patients.**

significant reduction in pain and anxiety in participants who were assigned the self-hypnotic relaxation app. The researchers also found that both iOS (Apple) and Android versions of the app were effective in reducing anxiety and pain, making this app accessible to most smart-technology users.

Comparisons with the placebo app showed no significant reduction in pain, suggesting that improvements in pain can be attributed to the self-hypnotic relaxation elements. There was an unexpected difference in

the performance of the two placebo control apps, however. The iOS placebo reduced neither pain nor anxiety performing as one would desire for a control app. The Android white noise app reduced anxiety despite having the same content as the iOS app.

Analysis of app usage patterns showed this difference was purely related to technical differences and the default settings favouring the prior patient's preferred sound scenario in case of the Android. This highlights the complexity of designing control apps.



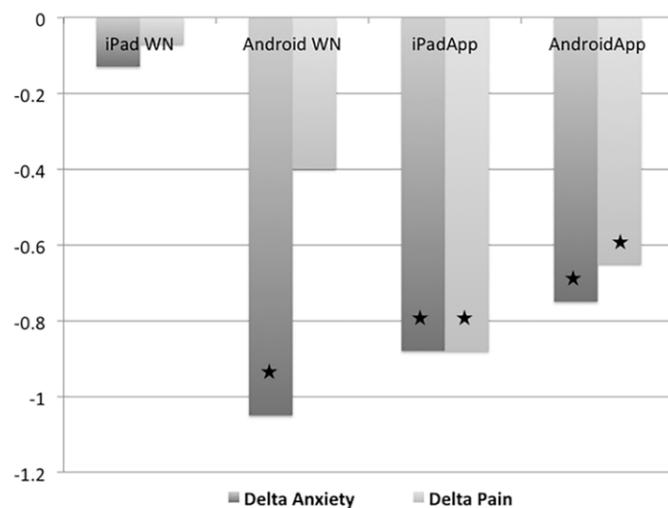
The self-hypnotic relaxation app was based on large-scale clinical trials by Dr Lang and teams.

## There was a reduction in pain and anxiety in participants who were assigned the self-hypnotic relaxation app.

When delivering auditory content, it is not always possible to entirely avoid environmental sounds which may jog the memory of the listeners and create internal imagery that may reduce anxiety. These environmental sounds, however, were not able by themselves to induce pain reduction as the target content of the self-hypnotic relaxation apps did.

### IMPLICATIONS

The results of this research showed impressive reductions in pain and anxiety using the self-hypnotic relaxation app. The app is a feasible, cost-effective, and safe method to reduce pain and anxiety in medical waiting rooms. Lang and colleagues suggest that this app could have a huge impact in the US alone for



The app could improve patient experiences and outcomes in a range of different clinical settings.

over 300 million dental patients and 100 million medical procedures annually.

In a previous study using complex statistical analyses, the researchers found that in medical settings, anxiety and pain tend to increase rather than decrease over time, relatively independent of the invasiveness of the procedure and the amount of drugs given. The fact that the self-hypnotic relaxation app managed to actually reduce anxiety and pain over time is therefore impressive and attests to its effectiveness.

The research is the first of its kind to follow a high-level evidence clinical design by rigorously comparing results to a placebo app with identical looks and functionality. Comparing to a placebo is not easy with an app because the mere act of operating a smartphone or tablet may be distracting and have an effect on anxiety or pain in of itself. This research approach may provide a model for future clinical app testing in other fields.

Given that the app is quick to complete and requires no preparation from clinicians, it could be suitable for a number of settings, including, but not limited to, busy waiting rooms. The app may have particularly strong utility in dentistry waiting rooms, where anticipatory anxiety is very common. Such anxiety could lead patients to cooperate less and experience more acute pain, and this can be a challenge for the dental professionals who may become more stressed themselves and consequently less able to focus on the job at hand. Therefore, the self-hypnotic relaxation app may be used to reduce anticipatory anxiety in dental waiting rooms and improve the overall experience for patients and professionals.

Overall, the self-hypnotic relaxation app developed by Dr Lang and colleagues has proven to be highly effective at reducing pain and anxiety in patients. High-level evidence and clinical-design research practices were applied, giving confidence in these findings and the effectiveness of the app. The self-hypnotic relaxation app may be useful in a number of clinical settings to improve the overall experience for patients and professionals alike.



# Behind the Research

## Dr Elvira Lang

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### Research Objectives

Dr Lang and colleagues aimed to develop an evidence-based self-hypnotic relaxation app to reduce anxiety and pain in clinical settings.

### Detail

#### Bio

Elvira Lang, MD, PHD, is an award-winning interventional radiologist and founder of Comfort Talk®. She is known for researching the effectiveness of rapid hypnotic techniques in medicine and dentistry in large-scale clinical trials. Dr Lang held faculty positions at the Universities of Heidelberg, Stanford, Iowa, and Harvard Medical School.

#### Funding

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#### Collaborators

- Donovan Aroni, DMD
- Ronald Kulich, PhD



### References

Schupp, CJ, Berbaum, K, Berbaum, M, & Lang, EV, (2005). Pain and anxiety during interventional radiologic procedures: effect of patients' state anxiety at baseline and modulation by nonpharmacologic analgesia adjuncts. *Journal of Vascular and Interventional Radiology*, 16(12), 1585–1592. [doi.org/10.1097/01.RVI.0000185418.82287.72](https://doi.org/10.1097/01.RVI.0000185418.82287.72)

Lang, EV, Benotsch, EG, Fick, LJ, Lutgendorf, S, Berbaum, ML, Berbaum, KS, et al, (2000). Adjunctive non-pharmacological analgesia for invasive medical procedures: a randomised trial. *The Lancet*, 355(9214), 1486–1490. [doi.org/10.1016/S0140-6736\(00\)02162-0](https://doi.org/10.1016/S0140-6736(00)02162-0)

Ajam, AA, Nguyen, XV, Kelly, RA, Ladapo, JA, & Lang, EV, (2017). Effects of interpersonal skills training on MRI operations in a saturated market: A randomized trial. *Journal of the American College of Radiology*, 14(7), 963–970. [doi.org/10.1016/j.jacr.2017.03.015](https://doi.org/10.1016/j.jacr.2017.03.015)

Lang, EV, Tan, G, Amihai, I, & Jensen, MP, (2014). Analyzing acute procedural pain in clinical trials. *Pain*, 155(7), 1365–1373. [doi:10.1016/j.pain.2014.04.013](https://doi.org/10.1016/j.pain.2014.04.013)

### Personal Response

**How can individuals, or professionals, who are interested in using this software, access the app?**

/// The Comfort Talk® Pro app is available for download from the Apple App store for iOS devices and the Google Play store for Android devices. For a practice-specific active app version and for the white noise placebo app contact directly [info@comforttalk.com](mailto:info@comforttalk.com). ///

