

Automated virtual reality-based psychological therapy may help reduce fear of heights

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Psychological therapy delivered by a virtual reality coach can help people with a clinically diagnosed fear of heights overcome their fear, according to a randomised controlled trial of 100 people published in *The Lancet Psychiatry* journal.

The study is the first to use [virtual reality technology](#) as a [treatment](#) without a therapist, providing a proof of concept for how some psychological interventions might be offered in future. However, more research is needed to understand how automated therapy would apply in other conditions, including more severe [mental health](#) disorders such as psychosis, where therapy is currently delivered by experienced mental health professionals.

Having a [fear](#) of heights is the most common phobia, with one in five people reporting having a fear of heights during their lifetime, and one in 20 people clinically diagnosed with a fear of heights.

In previous research, people with a fear of heights used [virtual reality training](#) in sessions with a therapist. The study found that it was as effective as exposure to heights in real life, and that the reduced fear lasted for at least a year.

In the new study, 100 people with clinically diagnosed fear of heights who were not receiving psychological therapy for it were given either the new automated virtual reality treatment (49 people) or usual care, which was typically no treatment (51 people). On average, [participants](#) had suffered a fear of heights for 30 years.

All participants completed questionnaires on the severity of their fear of heights at the start of the trial, at the end of treatment (two weeks later), and at follow-up after four weeks.

Participants given the virtual reality treatment had roughly six 30-minute sessions over two weeks, where they wore a virtual reality headset. In the first session, participants discussed their fear of heights with the virtual coach, explaining what caused their fear (for example, fear of falling, fear of throwing oneself off the building, fear of the building collapsing) while the virtual coach gave basic information about fear of heights.

Participants then entered a virtual office complex with ten floors and a large atrium space, where they took part in activities that challenged their fears and helped them learn that they were safer than they thought. These started with simpler tasks, such as watching a safety barrier to a drop gradually lowering, and built up to harder tasks, such as walking out on a platform over a large drop. Other tasks also included rescuing a cat from a tree, playing a xylophone near an edge, and throwing balls over the edge of a drop.

Throughout the activities the virtual coach offered encouragement, and afterwards they explained what the participant had learnt from their activities and asked whether they felt safer than before. The virtual coach also encouraged participants to try real heights between sessions.

Of the 49 participants offered the virtual reality treatment, 47 took part in at least one session, and 44 completed the full course of treatment. The three people who did not complete the intervention either found the sessions too difficult (two people) or were unable to attend further appointment sessions (one participant).

At the end of treatment and at follow-up, control group participants rated their fear of heights as remaining similar, but all participants in the virtual reality treatment group rated that their fear of

heights had reduced. By follow-up, 34 of 49 people in this group were not rated as having a fear of heights, compared with none of the 51 people in the control group.

There were no adverse events reported by any participants.

"Immersive virtual reality therapies that do not need a therapist have the potential to dramatically increase access to psychological interventions," says lead author Professor Daniel Freeman, University of Oxford, UK. "We need a greater number of skilled therapists, not fewer, but to meet the large demand for mental health treatment we also require powerful technological solutions. As seen in our clinical trial, virtual reality treatments have the potential to be effective, and faster and more appealing for many patients than traditional face-to-face therapies. With our unique automation of therapy using virtual reality there is the opportunity to provide really high quality treatment to many more people at an affordable cost. Our study is an important first step, and we are carrying out clinical testing to learn whether automation of psychological treatment using virtual reality works for other [mental health disorders](#)."

The authors note some limitations in their study, including that they did not compare against the psychological therapies currently used to treat phobias, such as counselling, psychotherapy, or cognitive behavioural therapy. Instead participants in the usual care group typically received no treatment. The participants also referred themselves to take part in the study, so may not be representative of all people with fear of heights.

The authors also note that they relied on questionnaires to assess participants' fear of heights, and did not test them in real-world scenarios.

The initial cost of software development was high, with a team of psychologists, programmers, script writers, and an actor working intensively for six months, but subsequent costs for the treatment were low, as a therapist does not need to be present and consumer virtual reality hardware is now inexpensive.

The trial did not assess which part of the treatment caused the improvements, and did not test long-term outcomes of the treatment as previous studies have shown that virtual reality treatment can reduce anxiety for several years. The authors note that the treatment was brief, and further benefits could be possible with a longer treatment duration.

Commenting on the virtual reality treatment, one participant said: "What I'm noticing is that in day-to-day life I'm much less averse to edges, and steps, and heights, and I'm noticing in myself that when I'm doing the VR and outside I'm able to say 'Hello' to the edge instead of bracing against it and backing up. When I'm doing the VR I'm, as best as I'm able to, being open and curious around me as much as I can and noticing how the anxiety feels in my body, and then noticing that it goes really quickly now. So, when I've always got anxious about an edge I could feel the adrenaline in my legs, that fight/flight thing; that's not happening as much now. I'm still getting a bit of a reaction to it, both in VR and outside as well, but it's much more brief, and I can then feel my thighs soften up as I'm not bracing up against that edge. I feel as if I'm making enormous progress, and feel very happy with what I've gained."

Writing in a linked Comment, Dr. Mark Hayward, University of Sussex, UK, welcomes the study's benefits for people with a fear of heights, but questions how [virtual reality](#) treatments could apply for [people](#) with more severe mental health problems. He says: " Psychological treatments for patients with psychosis face many challenges, because access to the treatments can be restricted and the treatment might generate only small effects. Symptom-specific treatments targeting either paranoia or auditory hallucinations are generating promising outcomes that might increase effect sizes, but their delivery in traditional face-to-face formats by expert therapists will do little to increase access (even when technology is utilised, such as in AVATAR therapy). VR is a promising method for delivering psychological treatments to patients with psychosis, but can a fully automated delivery system increase access? And are greater effects also possible because of the virtual exposure to everyday situations that are experienced as threatening?"

More information: *The Lancet Psychiatry* (2018).

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