ZeroPhobia

Manual for Therapists

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Amsterdam, June 2021 - Version 1.0

Content

Chapter 1. Virtual Reality Exposure Treatment

Exposure in vivo, in which people confront themselves with their anxiety in real life, is one of the most effective methods for learning to cope with anxiety. In addition to "traditional" exposure in vivo, exposure using virtual reality (VR) has been used for decades. In VR exposure therapy (VRET), virtual environments replace exposure situations. By means of a computer and VR glasses, the user is immersed in a virtual world in which s/he can practice with different scenarios. That this form of exposure is effective for reducing anxiety symptoms, particularly for specific phobias, has now been demonstrated by dozens of individual studies and by various meta-analyses[1]. This research shows that the effects of VRET are similar to exposure in vivo[2].

VRET has a number of advantages over traditional in vivo treatment. An important practical advantage is that the client can practice with different situations without having to leave the therapist's treatment room. For example, consider practicing with vertigo that normally requires seeking out high places such as balconies, apartment buildings or bridges, which can be quite time consuming. In addition, VRET is ideally suited for practicing with objects or situations that are difficult to access or are rare, such as a thunderstorm, or expansive, such as an airplane. Also, the advantage of using VR is that a practitioner has full therapeutic control over the exposure situation. The situation or object (such as small spaces, airplane cabins, animals, and thunderstorms) is pre-programmed so exposure can be dosed in detail and adapted to the client. The therapist only has to select the environment and the level with which the client wants to practice and can choose from different scenarios. In addition, VR proves to be a perfect intermediate step for patients who experience too much fear to practice in the real world.

VRET does not necessarily aim to replace traditional in vivo treatment but to facilitate exposure for both client and therapist when the client is too anxious to practice directly with in vivo exposure.

[1]Fodor LA, Cotet CD, Cuijpers P, Szamoskozi S, David D, Cristea IA (2018). The effectiveness of virtual reality based interventions for symptoms of anxiety and depression: a meta-analysis. SciRep. 8 (1): 10323. doi:10.1038/s41598-018-28113-6 12

[2] Morina N, Ijntema H, Meyerbröker K, Emmelkamp PM. (2015). Can virtual reality exposure therapy gains be generalized to real-life? a meta-analysis of studies applying behavioral assessments. Behav Res Ther., 74:18-24. doi: 10.1016/j.brat.2015.08.010

Chapter 2. ZeroPhobia VR – CBT app

Despite the benefits of VRET as described in the previous section, this form of treatment still includes relatively high costs. It requires the purchase of software and special equipment that most people and therapists do not have themselves. Often the purchase of this is not worthwhile for therapists who treat relatively limited numbers of patients with specific phobias. As a result, VRET is not yet accessible to a large portion of the population. In addition, the treatment of specific phobias is no longer reimbursed by our health insurance. The high costs of existing forms of therapy and the long waiting lists in health care, have led to the development of ZeroPhobia.

ZeroPhobia is a encompassing cognitive behavioral therapy (CBT) delivered through an app that the user downloads on his/her own phone. Exposure, the core of the treatment, in which users are exposed to the object or situation they fear takes place through virtual reality. By using a smartphone in combination with a simple pair of virtual reality glasses (cost: €10-€30), a simple but effective VR experience is created. Due to its scalability, low cost, and ease of use, this type of treatment has the potential to eventually provide a virtual solution to phobias, including for individuals who would not normally have access to adequate mental health services.
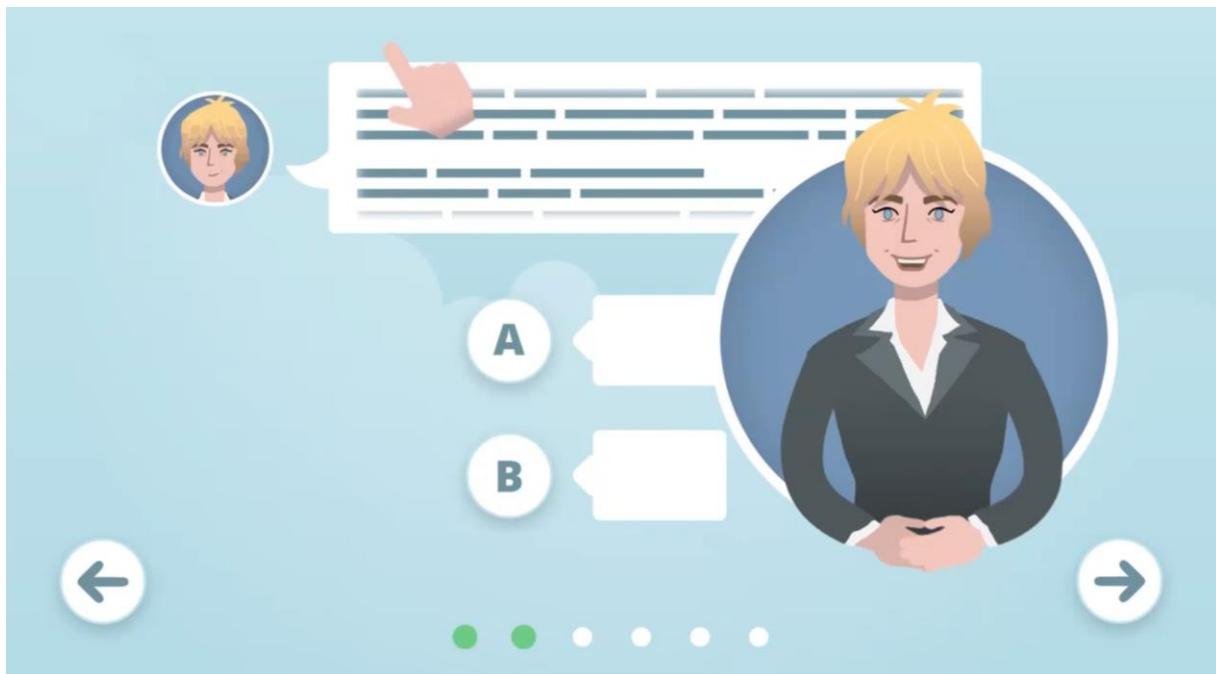
ZeroPhobia

ZeroPhobia consists of six CBT-based modules. The modules are accessed from the home screen (see Figure 1). The modules provide psychoeducation, goal setting, VR instruction, identifying dysfunctional thoughts, developing helpful functional thoughts, and creating an anxiety hierarchy. Once a module is completed, the next one is unlocked. In addition, there is a "watch again" menu where each of the instructions can be re-watched, a menu that allows access to the VR environments, a "My ZeroPhobia" menu where participants can see the goals they have set themselves for the intervention, as well as their dysfunctional and functional thoughts, and their fear hierarchy to practice in the real world. Participants follow the modules at their own pace. Modules vary in length from 5 to a maximum of 40 minutes.

Figure 1 *Startscreen of ZeroPhobia*

The CBT content in the modules is provided by an animated virtual therapist and a voice-over. The virtual therapist, "Tara," guides the participant through the intervention (see Figure 2). There are also recurring characters to help motivate the user.

Figuur 2 *Virtual therapist Tara*

ZeroPhobia- Fear of Heights

In ZeroPhobia – Fear of Heights, the recurring character, "Louise," is a theater manager who has overcome her own fear of heights with the help of ZeroPhobia. In addition to the six animated modules, ZeroPhobia – Fear of Heights consists of two VR environments, the inside and outside of a theater (Figure 3). From Module 3 onwards, participants begin practicing exposure in the ZeroPhobia VR theater. The VR theater is a "gamified" VR environment and requires the user to replace Louise as a manager and carry out several "tasks" to prepare the theater for the evening's performance. These tasks include various levels of exposure to height (from standing on a small ladder to standing on the roof of the theater). Gradual exposure and 'gamification' ensure that the tasks always require the user to look down and thus challenge his or her fear of heights. Levels can also be replayed over and over again so that the user can descend and overcome the fear at his or her own pace. Both the modules and the VR experience are designed to be user-friendly and require no technical skills.

Figure 3 *Impression of VR environments of ZeroPhobia-Fear of Heights*

ZeroPhobia- Fear of Flying

In ZeroPhobia - Fear of Flying, there are two recurring characters that help illustrate the fear of flying and motivate the participant to work with the app and their phobia. These are "Bruno" and "Chloe". They explain how they overcame their fear of flying through ZeroPhobia and give examples of their own issues. The VR environments of ZeroPhobia - Fear of Flying covers the different aspects of flying including checking in for the flight, waiting in the trunk, taking off, turbulence, and landing (see Figure 4). In the VR environment, tasks are given, such as relaxation exercises or calming an anxious fellow passenger by telling her reassuring facts about flying, and techniques are provided that can also be applied in a "real" flight to help users learn to cope with his/her anxiety.

Figure 4 Impresson from *VR environments of ZeroPhobia- Fear of Flying*

Anxiety level in VR

After playing a level, participants are asked about their anxiety level. If their anxiety level is rated with a score of 3 or lower on a 10-point scale, a notification appears that they can proceed to the next level. If the user indicates that their anxiety level is above 4, the user is told to practice one more time with the same level before they can move on to the next level.

This was developed because ZeroPhobia is also offered unaccompanied and therefore we want to avoid a user panicking at a level that is actually too scary.

What does the client need?

ZeroPhobia can be followed on a smartphone and is suitable for most, but not all, smartphones, both Android and iPhone. For iPhones, an iPhone 7 or more recent is required. For Android, phones after 2014 are generally suitable if equipped with a gyroscope. The app store for Android phones, Google Play, indicates whether a phone is suitable when downloaded (i.e. downloading is not possible if a phone turns out not to be suitable). Users therefore do not need to find out in advance whether their phone has the required specifications.

Practicing in VR with ZeroPhobia requires a pair of VR glasses or 'VR viewer' that can be used in conjunction with a smartphone. These glasses range from a simple 'cardboard' viewer (see for example: https://arvr.google.com/cardboard/) to generally slightly more expensive and more durable plastic glasses. The phone is slid into the viewer creating a VR experience. The website ZeroPhobia.app lists two goggles that can be purchased, but these are just two examples of many possibilities. VR glasses are available in many places, online and offline. In addition, one must consider that the size of the phone is proportional to the VR glasses one purchases. Most VR viewers are relatively universal but for very large or relatively small phones it is good to pay attention to this. No other technical knowledge is required to use ZeroPhobia.

Scientific evidence

ZeroPhobia is science-based and our apps are routinely studied in clinical trials. The effects of ZeroPhobia fear of heights have been scientifically supported through a Randomized Controlled Trial (RCT) in which nearly 200 participants participated. We found a large effect (d = 1.14) compared to a wait-list control group at the post-intervention measurement after three weeks, even with a very conservative method of analysis. Of those who completed the intervention, nearly 80% experienced a clinically significant symptom difference (Donker et al., 2019).

The effectiveness of ZeroPhobia Fear of Flying has also been studied in a large-scale RCT. The results of this study are expected to be published in late 2021. For more information about research on ZeroPhobia, see: https://www.zerophobia.app/nl/de-wetenschap/.

Chapter 3. Hybride ZeroPhobia: Support from a therapist

In addition to the unaccompanied form, ZeroPhobia is also suitable for use in hybrid form, for example with support through a psychologist or psychotherapist. There are several ways to offer ZeroPhobia in hybrid form, depending on the preferences of the practitioner and those of the client, the anxiety level of the client, practical and financial considerations. The following section discusses a number of different treatment options. Some general components of hybrid ZeroPhobia treatment are discussed below.

Motivate and Encourage

When you and your client decide to use ZeroPhobia in treatment, your main task, as in a traditional CBT treatment for specific phobia, is to motivate and encourage your client to confront his/her fear. For example, you can have the client envision his/her goals and what he/she cannot do at the moment but will be able to do later after successful therapy (such as going on vacation, visiting certain acquaintances or friends, etc.), compliment him/her on overcoming an exposure level or attempts to do so, and suggest that the client give himself/herself small rewards for a completed exposure task.

Explaining and deepening the exercises from the ZeroPhobia app.

Another important task is to help the client if there are ambiguities when creating the exercises from the ZeroPhobia app or if he/she does not understand something from the explanation or rationale of the therapy. Modules 1-3 are relatively simple and straightforward, but as a therapist, Modules 4-6 certainly allow you to provide more support. In Modules 4 and 5, automatic thoughts are detected and evaluated. Should this also play a role in the maintenance of your client's symptoms, you may choose to evaluate the automatic thoughts via traditional CBT therapy techniques on a whiteboard during your the therapeutic session. In Module 6, an anxiety hierarchy is created. This exercise also lends itself well to explaining further during a live session and motivating the client to take a first step toward exposure in vivo. In the ZeroPhobia app, the client is encouraged to practice steps in the fear hierarchy in a hierarchical fashion (i.e., step 1 first, then step 2, etc.). Because ZeroPhobia is also offered unaccompanied, this (more conservative) approach was chosen. Recent research shows that this does not necessarily have to be adhered to and that a more natural approach to practicing with the fear hierarchy may be better for preventing relapse (i.e., the client can practice with step 1 and then, for example, with step 4 if it happens to present itself that way). Therefore, when therapeutic support takes place with ZeroPhobia, the therapist can also encourage the client to choose steps in the fear hierarchy that do not necessarily follow the previous step of the client (i.e., after step 3, for example, the client chooses step 6) provided that the client indicates that he/she thinks he/she can handle this.

Providing support for VR exposure: anxiety level, cybersickness, and technical issues

When your client starts practicing exposure in VR, there are a few things that are important:

Fear level is too high

VR can be a good intermediate step for clients who still find practicing in the real world too scary, because VR is not "real." Nevertheless, even here the fear level can still be very high. You can reduce the step for practicing by being present as a therapist when your client is practicing in VR for the first time. This often already gives the client a somewhat safer feeling. After that, the client can practice at home with a trusted acquaintance next to him/her and then start practicing alone. In the case of ZeroPhobia Fear of Heights, the client can first practice sitting down and when the fear has subsided, practicing standing up.

For all apps, it is important to take your time and get used to a VR level and if necessary, repeat a VR level. When the fear is still too high for practicing with VR in ZeroPhobia, the client could also first start with imaginary exposure, i.e. imagining being at altitude or in an airplane.

Fear level too low

Of course, it is also possible that your client does not feel any fear at all during exposure in VR. Sometimes it helps to give practicing in VR time. It may be that the client needs time to feel present in the VR environment. If this does not help, the client who is afraid of heights can still practice with the 360° videos that are (free) accessible via ZeroPhobia`s website. These can be viewed via Youtube with the VR viewer. For clients with fear of flying for whom exposure does not help, one can choose to undergo a two-day "in vivo training" that is often offered by specialised fear of flying psychologists.

Cybersickness

When you practice in VR, you may experience nausea. This phenomenon is called "cybersickness" and is similar to motion sickness such as car sickness. If this happens to your client, you can offer some tips:

- Drink coca cola beforehand

- Take a break in between and drink a sip of water

- Exercise more. It seems that the more often one exercises, the less nausea there is.

- Keep the eyes focused on one point while turning head or body

- Putting a cotton ball in the ear opposite the writing hand

Monitoring and evaluation

Your client can go through the app independently. In accordance with a traditional treatment you also monitor the complaints of your client during the treatment with ZeroPhobia. In addition, it is important that you evaluate these symptoms regularly, for example before the therapy starts, during the therapy and at the end and discuss these with your client.

Finally

It is advisable to first go through the app yourself to get familiar with the app, but the client can also show this in the therapy.

Chapter 4. Examples of a hybride ZeroPhobia treatment

The following are some options for possible hybrid ZeroPhobia applications.

Option 1: email support
This option would be suitable for clients with a specific phobia who can work independently and are motivated to confront their fear and where no serious co-morbid disorders are identified. After the diagnostic interview, the client goes through ZeroPhobia on his own with weekly monitoring by email. The therapist emails the client asking how he/she is doing, asking about his/her progress and experiences, and if s/he has any questions. The client emails back within 3 days. After six weeks, the final evaluation takes place and the final measurement is made to see if there is still a need for help.

Option 2: face-to-face 'light
In case the client is diagnosed with only a specific phobia (fear of flying/altitude) and no co-morbid disorders, and the client would like to start working independently, but is strongly inclined to avoid when the fear gets too high. Then a hybrid form in which there is minimal intervention by the therapist which is mainly aimed at motivating can be used. After the face-to-face diagnostic interview in which the basic measurement has been taken and the goals of the treatment have been determined, the client starts working with the app independently. After one week an interim evaluation (face-to-face or by phone) takes place in which the experience, progress and any questions are discussed. An interim measurement is also taken in which the fear of heights / fear of flying questionnaire is again taken. The therapist and the client set new goals together for the following week. The treatment can be completed in 3-6 weeks. In the meantime, 1 or 2 weekly telephone or face-to-face counseling sessions can be scheduled. After a maximum of 6 weeks, a final evaluation will take place and we will see if the complaints have decreased based on the questionnaires. If there is no longer a need for help, the treatment will be completed. If not, one can choose to practice more with VR or use exposure in vivo as a treatment method.

Option 3: face-to-face 'moderate

This option can be used when there is a very high anxiety level in the client. After the intake and basic measurement and the formulation of a treatment plan with explicit goals, the client can independently complete the first three modules. The client has weekly contact with his/her therapist. In the face-to-face sessions, the client practices exposure in VR in the presence of the therapist. When the anxiety has subsided, the client can practice with exposure at home in the presence of someone they know and then work independently. The client can then use the ZeroPhobia app to track and evaluate automatic thoughts. In the therapy sessions, the client is supported in this and the evaluation of thoughts can be deepened with other CBT techniques. Through the app, the client creates an anxiety hierarchy that is discussed in the session. The client is then encouraged to practice further in real life. Progress is measured during and at the end of the treatment. After an agreed upon end date a final evaluation will take place to see if the symptoms have decreased based on the questionnaires. If there is no longer a need for help, the treatment will be completed. If not, one can choose to practice more with VR or to use exposure in vivo as a treatment method.

There are several questionnaires for measuring fear of heights and fear of flying such as the Acrophobia questionnaire (AQ[3]) and the Flight anxiety scale (FAS[4]).

[3] Cohen DC. Comparison of self-report and overt-behavioral procedures for assessing acrophobia. *Behav Ther*. 1977;8(1):17-23. doi:10.1016/S0005-7894(77)80116-0

[4] Van Gerwen LJ, Spinhoven P, Van Dyck R, Diekstra RFW. Construction and psychometric characteristics of two self-report questionnaires for the assessment of fear of flying. Psychol Assess 1999;11(2):146-158. [doi: 10.1037/1040-3590.11.2.146

Hoofdstuk 5. Frequently Asked Questions

If your client encounters technical glitches, please refer him/her to the FAQ on the website zerophobia.app. For your convenience, the FAQ about practising in VR are listed below:

The cross to exit in the Virtual Reality environment is not working

That's right. To go back to the modules or level selection screen from VR, look for the "Exit Level" or "Exit VR." button.

The image of the virtual reality environment involuntarily shifts slowly to the left or right

This is called "image drift." There are 3 solutions to this:
1. Put your phone down with the screen facing down and wait 20-30 seconds. After that, the drift is gone.
2. Type into your "call number screen": *#0*# . Go to 'sensor' then to ' gyro self test'. Then open ZeroPhobia again. See also: https:// www.youtube.com/watch?v=_imVEETkWpc
3. If you close and restart the app, this problem will probably be fixed as well. For android, see: http://nl.wikihow.com/Apps-afsluiten-in Android 2. See for iPhone: https://www.iculture.nl/tips/multitasking-appsafsluiten-iphone-ipad/ Restart ZeroPhobia by clicking on the ZeroPhobia app. When you go back to VR, the problem should be fixed. In some cases, this procedure may need to be repeated several times.

The virtual reality environment/app crashes

When you close and restart the app, this problem will probably be fixed. See for android: http://nl.wikihow.com/Apps-afsluiten-in Android. For iPhone, see: https://www.iculture.nl/tips/multitasking-apps-afsluiteniphone-ipad/. Restart ZeroPhobia. When you go back to VR, the problem should be fixed. In the unlikely event that it is not fixed, you can uninstall and reinstall the app.

What can I do about the nausea while practicing in the VR environment?

- Drinking coke beforehand

- Take a break in between and drink a sip of water

- Practice more. It seems that the more often you practice, the less nausea you will experience.

- Keep your eyes focused on one point while turning your head or body

The VR environment suddenly gets darker

This is because the brightness of the device is set to "automatic". If there has been no activity for a long time (clicking on the screen), such as during the VR exercises, the brightness goes down to save battery power. If your battery is almost empty this can also happen. Make sure your battery is charged enough and uncheck "automatic" brightness. For iPhone: Go to settings → Display and brightness → Automatic (off) For Android: Go to settings → Brightness → Brightness automatic (off). Depending on your device, this will look a little different.

How do I move around in the app?

In the VR environment, you don't have to walk to an object yourself. ZeroPhobia uses 'gaze control', which means you only need to look at an object to move around.