ISRCTN87716831 https://doi.org/10.1186/ISRCTN87716831

Is Virtual Reality effective to motivate and raise interest in phobic children towards therapy?

Submission date	Recruitment status	[ ] Prospectively registered
12/03/2008	No longer recruiting	[ ] Protocol
Registration date	**Overall study status**	[ ] Statistical analysis plan
12/05/2008	Completed	[X] Results
Last Edited	**Condition category**	[ ] Individual participant data
20/09/2010	Mental and Behavioural Disorders	

Plain English summary of protocol
Not provided at time of registration

Contact information

Type(s)
Scientific

Contact name
Prof Stephane Bouchard

Contact details
Université du Québec en Outaouais
Dept. de Psychoéducation et de psychologie
CP 1250, Succ Hull
Gatineau
Canada
J8X 3X7
+1 819 595 3900
stephane.bouchard@uqo.ca

Additional identifiers

Protocol serial number
N/A

Study information

Scientific Title

Acronym
VR-motivation

Study objectives
Because children are often attracted by technology and video games, virtual reality (VR) can be a useful tool for sparking their interest in therapy and for maximising their motivation. The general objective of the present study was to explore the impact of VR on child motivation. Our hypotheses were that children receiving treatment combining VR with in vivo exposure would show a greater degree of general motivation, a greater degree of integrated regulation, and greater interest in their therapy than children treated with in vivo exposure. The studys second hypothesis was that motivation would predict therapeutic success.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Ethics approval received from the Comite d'Ethique a la Recherche de l'Universite du Quebec en Outaouais on the 11th March 2004 (ref: 281).

Study design
Interventional randomised, single-centre trial with no masking performed.

Primary study design
Interventional

Study type(s)
Quality of life

Health condition(s) or problem(s) studied
Incapacitating fear and avoidance of spiders

Interventions
Participants:
A total of 31 children who met the study's criteria took part in the program. Five were males and twenty-six were females. Their ages ranged from 8 to 15 years, with a mean age of 10.16 years (SD = 1.5)

Procedure:
The selection began with a brief telephone interview to determine that the participants met the selection criteria. During the interview at the clinic, the parents and children were given the specifics of how the child's treatment would be conducted. They then completed a battery of questionnaires. The behavioural avoidance test (BAT) was given before the questionnaires to avoid administering tests to a non-phobic child.

Treatment:
1. Information session on specific phobia and the rationale behind the treatment -
Using a cognitive-behavioural approach, the therapist explained what is a specific phobia and how it is treated. Information given to the children was adapted to their age group. They received a booklet containing illustrations and exercises that explained the rationale behind the therapy. At the end of the session, the children in the combined in virtuo and in vivo exposure group were introduced to the VR system.

2. First phase of the exposure program -
The first phase of the exposure program consisted of four sessions of in virtuo or in vivo exposure, depending on the participants' condition assignment:
2.1. In virtuo exposure:
Therapy consisted of four 60-minute sessions over four weeks. The participants had to gradually approach virtual spiders (of various sizes and quantity) until their anxiety diminished. The virtual environment consisted of two apartments composed of a bedroom, living room, kitchen and bathroom, in which spiders were inserted.
2.2. In vivo exposure:
In vivo therapy was also provided in four 60-minute sessions The in vivo participants were confronted gradually at their own pace, starting with pictures of spiders, various plastic spiders and up to a live tarantula (Grammostola Rosea, 14 cm long). Like in the in virtuo condition, the discomfort brought on by anxiety was verbally checked every five minutes throughout the session.

3. Second phase of the exposure program -
The second phase of the exposure program consisted of one in vivo exposure session for all participants
The participants were exposed to the same live tarantula as the one in the behavioural avoidance test (Grammostola Rosea, 14 cm long). At the end of the in vivo exposure session, an additional period of time was devoted for relapse prevention. Note that the live tarantula was always in a vivarium and the patients could not touch it.

Patients will be followed-up for six months.

Intervention Type
Other

Phase
Not Applicable

Primary outcome(s)
The diagnosis interview:
The Anxiety Disorders Interview Schedule for DSM-IV-Child Version and Parent version (ADIS-C and ADIS-P). To assess the presence of spider phobia and comorbid disorders, the participants and their parents took part in separate semi-structured interviews aimed at detecting anxiety disorders in the children. Studies conducted on these instruments suggest a high inter-rater reliability (r = 0.98 for interviews with parents and r = 0.93 for interviews with children 18 and high test-retest reliability (k = 0.76 for interviews with parents).

Questionnaires and behavioural measure:
The first four instruments deal with motivation, interest, and participant's perception of the therapy program. The last two measures of motivation were designed for the current study and administered beforehand to an independent sample of 31 school-aged children to ensure they understood the items.

Measures of motivation and interest toward treatment:
1. "Why are you in therapy?" Questionnaire for children. This is the target measure of motivation, the main variable in this study. It assesses the type of motivation shown by patients in therapy, as defined by Deci and Ryan. To shorten the questionnaire from 24 to 17 items, we retained only the two items with the highest saturation on each subscale. The rating ranges from 1 to 5 on a

Likert-type scale ranging from "Not at all" to "Absolutely". Participants had to fill out the questionnaire at pre-treatment (T1), post-phase one (T4) and post-treatment (T5).
2. The Treatment Appeal Questionnaire was composed of a single item asking to what extent the child would have preferred to receive the other form of therapy (e.g., in virtuo for those in the in vivo condition). Responses ranged from 1 to 5 on a Likert-type scale describing the degree to which the child agreed with the statement. The measure was taken at pre-treatment (T1), at the information session (T2) and during each of the sessions of the first phase of the exposure program (T3).
3. The Treatment-related Discomfort Questionnaire consisted of four items designed to assess signs of reluctance to come to therapy. The parents had to indicate to what extent they were in agreement with the statements describing their child emotions and behaviours before coming to each therapy session in the two phases of the treatment program (T3 and T5). The choices of responses were from 1 to 7, on a Likert-type scale ranging from "Does not correspond at all" to "Corresponds completely" and were averaged to produce the final score.

Measures of treatment outcome:
4. A shortened version of the Spider Beliefs Questionnaire was used. The 23 items with the strongest loadings on both subscales (beliefs about spiders and beliefs about oneself in presence of a spider) were retained. The measure was administered at pre-treatment (T1), post-phase one (T4), post-treatment (T5) and at the six-month follow-up (T6).
5. The Spider Phobia Questionnaire for Children (SPQ-C) was administered at pre-treatment (T1), after phase one of the treatment (T4), at the end of the treatment program (T5) and at the six-month follow-up (T6). The instrument contains 29 items that measure the severity of fear of spiders and avoidance behaviors using a dichotomous true-false format.
6. The Behavioural Approach Test (BAT). This test was adapted from a study by Lavy and collegues and provides an objective of phobic avoidance. The BAT was administered at pre-treatment (T1), post-phase one (T4) and post-treatment (T5). A live tarantula was put in a closed vivarium (completely hidden under a cardboard box) on a motorised platform placed on a table, 173 cm from the participant. The child could move the vivarium closer in by pushing a button at his/her own pace. The BAT score varied from 0 (refuse to perform the test) to 10 (the strongest approach behaviour), and the last step the child was able to complete provides the score. The child sat at the end of the motorised platform and the researcher lifted the cardboard box (Step 1). Then the lid of the vivarium was removed (Step 2). Note that the tarantula could effectively get out once the lid was removed (the children were aware of this). After looking at the tarantula for 1 minute, the child pressed on a button that slowly moved the open vivarium closer on the motorised platform (Steps 3 to 9 consisted of each time the child moved the platform 25 cm closer). Once the vivarium was within 23 cm of the child, he/she had to lean forward over the opening of the vivarium and look at the tarantula for 1 minute (Step 10). During the BAT, participants were allowed to take short breaks and stop the platform, but any pause longer than 25 seconds was considered a complete stop. The whole procedure was explained to the children before they began the test.

Measurement times are indicated as follows:
T1 = pre-treatment
T2 = information session
T3 = mean of the scores collected weekly during the first phase of the treatment
T4 = post phase one
T5 = post-treatment
T6 = follow-up

Key secondary outcome(s))

Measures relating to use of the virtual reality:
The following three ancillary measures were administered to describe the sample using questionnaires that are important to measure in VR studies:
1. The Immersion Tendencies Questionnaire was administered at pre-treatment (T1) in order to describe the sample and the extent to which the child could easily feel immersed in the virtual environment. It consists of 34 questions on a 7-point Likert-type scale (from 1 - never to 7 - often).
2. The 19-item Child Presence Questionnaire measured the extent of the child's feeling of being there in the virtual environment, a variable considered a prerequisite to emotionally react when immersed in a virtual environment.
3. The 11-item Cybersickness Questionnaire measured the extent to which the children were affected by side effects induced by their immersion in virtual reality (nausea, eye fatigue, dizziness, etc.) and was administered after each therapy session in virtual reality (mean of the scores collected during the first phase of the treatment, T3).

Results regarding these instruments revealed that the immersive tendency and feeling of presence were adequate and little cybersickness was reported.

Completion date
01/06/2007

Eligibility

Key inclusion criteria
1. Had to obtain the consent of their parent or legal custody guardians
2. Had to have received a principal diagnosis of arachnophobia based on the Diagnosis of Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) criteria
3. Children (8 - 15 years), either sex

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Child

Lower age limit
8 years

Upper age limit
15 years

Sex
All

Key exclusion criteria
1. Mentally handicapped
2. Suffering from a major physical disability, epilepsy, disorders of the vestibular system or otitis

media (these criteria were fixed a priori, but none of the children had such disorders)
3. Suffering from another psychiatric or medical disorder requiring immediate or prerequisite treatment
4. Taking medication that could block the effect of anxiety (for example, benzodiazepines and serotonin reuptake inhibitors)
5. Children who were only slightly phobic; those (n = 3) who obtained a score of 9 or 10/10 on a behavioural avoidance test (BAT)

Date of first enrolment
01/09/2004

Date of final enrolment
01/06/2007

Locations

Countries of recruitment
Canada

Study participating centre
Université du Québec en Outaouais
Gatineau
Canada
J8X 3X7

Sponsor information

Organisation
University of Quebec in Outaouais (Universite du Quebec en Outaouais) (Canada)

ROR
https://ror.org/011pqxa69

Funder(s)

Funder type
Other

Funder Name
Investigator initiated and funded (Canada)

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not provided at time of registration

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/07/2010		Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes