

The effects of the use of virtual reality (VR) during dental treatment

Submission date 08/07/2013	Recruitment status No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
Registration date 02/08/2013	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
Last Edited 23/10/2018	Condition category Oral Health	<input type="checkbox"/> Individual participant data

Plain English summary of protocol

Background and study aims

Dental anxiety and avoidance of dental care due to anxiety cause major problems for both patients and dentists. Various distraction methods are used in daily medical practice to help patients cope with unpleasant procedures, but there is evidence that Virtual Reality (VR) distraction is more effective than other distraction methods. The main aim of the project is to find out if the use of VR during dental treatment can improve the overall dental experience and recollections of treatment for patients, breaking the negative cycle of memories of anxiety leading to further anxiety, and avoidance of future dental appointments. Additionally, the aim is to test whether the use of VR is suitable for dental patients with all levels of dental anxiety. The third aim is to test if the content of the VR distraction can make a difference by comparing two types of virtual environments, a natural area and an urban area.

Who can participate?

Patients who are scheduled to undergo dental treatment will be invited to take part in the study.

What does the study involve?

After the pre-operative treatment appointment or annual check-up, patients will complete an initial questionnaire. During the dental treatment visit, the patient might be asked to wear some special goggles that will enable watching a VR scene. Whether a patient will be allocated to a VR group or a control group will be decided by a process called 'randomisation', which is like a coin toss. Following the appointment the patient will complete a questionnaire about the treatment experience. Patients will receive a phone call one week after treatment and will be asked to answer a few more questions.

What are the possible benefits and risks of participating?

We cannot promise the study will help you, but the information from this study may help improve the care provided to patients who experience anxiety regarding dental treatment in the future. However, some people may find that their dental experience is more pleasant and induces less anxiety than usual. There is little physical risk to participants involved in this project. Using the VR goggles and controller will not be for a long enough period to become a problem. Some people may have feelings of nausea when using the VR system. Patients will be informed

that this may occur and that they should inform the dentist if they start feeling nauseous so the VR session can be stopped. Withdrawal during dental treatment won't affect the dental treatment; it only involves taking the VR goggles off the patient and taking back the controller from the patient. Patients are informed that they are free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect the standard of care they receive.

Where is the study run from?

The study takes place at Torrington Dental Practice in Greater Torrington, UK.

When is the study starting and how long is it expected to run for?

It is anticipated that recruitment will start in August 2013 and finish by the end of 2014.

Who is funding the study?

Plymouth University, UK.

Who is the main contact?

Dr. Karin Tanja-Dijkstra

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Contact information

Type(s)

Scientific

Contact name

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Additional identifiers

Protocol serial number

N/A

Study information

Scientific Title

The effects of virtual reality distraction during dental treatment: a first test of the elaborated intrusions account

Study objectives

It is hypothesised that exposure to virtual reality during dental treatment will lead to improved recollections of treatment and an overall improved dental experience.

On 06/02/2014 the overall trial end date was changed from 31/12/2013 to 31/12/2014.

Ethics approval required

Old ethics approval format

Ethics approval(s)

National Research Ethics Service (NRES) Committee West Midlands - Coventry & Warwickshire, 10/05/2013, ref: 13/WM/0152

Study design

Three group randomised controlled clinical trial

Primary study design

Interventional

Study type(s)

Treatment

Health condition(s) or problem(s) studied

Dental treatment and anxiety

Interventions

Patients will be randomised to three groups:

Two intervention groups: Two VR interventions will be investigated in this study. The first VR environment consists of a simulation of a natural area. The second VR environment consists of a simulated urban environment.

In both groups, patients will be wearing VR goggles and will use a one-handed controller to navigate the environment.

Control group: The patients in the control group will receive standard care

Intervention Type

Other

Phase

Not Applicable

Primary outcome(s)

1. The memories of patients about the dental treatment one week after treatment, consisting of
 - 1.1. Remembered pain
 - 1.2. Intrusive thoughts
 - 1.3. Vividness of memories
2. Dental experience
3. Treatment experience
4. VR experience

Key secondary outcome(s)

1. Treatment experience [pain, discomfort, stress - self-reported questionnaire and a physiological indicator (heart rate, measured with a pulse oximeter), time perception, perceived

control]

2. Dental experience (communication with dentist, revisit intentions and likelihood of avoidance, dental anxiety, treatment satisfaction)
3. VR experience (presence, perceived restoration, attractiveness, environmental awareness, nausea, intention to use VR)

All outcomes are measured using self-reported questionnaires.

Completion date

31/12/2014

Eligibility

Key inclusion criteria

All patients, 18 years or older, who are scheduled to undergo dental treatment for fillings and/or extractions with a planned maximum treatment length of 30 minutes are eligible to participate in the study. This includes both referred patients and in-house patients. Both patients who need relative analgesia (RA) and who are treated without sedation will be included.

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 years

Sex

All

Key exclusion criteria

1. Patients who need intravenous sedation
2. Patients who had epileptic seizures in the past cannot participate in the study due to the very small risk an episode can be triggered by using the HMD, similar to what may happen if they are exposed to a television
3. If a patient is scheduled for more than one treatment during the trial period, the patient will only be included for the first treatment

Date of first enrolment

16/08/2013

Date of final enrolment

31/12/2014

Locations

Countries of recruitment

United Kingdom

England

Study participating centre

Plymouth University

Plymouth

United Kingdom

PL4 8AA

Sponsor information

Organisation

Plymouth University Peninsula Schools of Medicine and Dentistry (UK)

ROR

<https://ror.org/04dtfyh05>

Funder(s)

Funder type

University/education

Funder Name

Plymouth University (UK)

Alternative Name(s)**Funding Body Type**

Private sector organisation

Funding Body Subtype

Universities (academic only)

Location

United Kingdom

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	12/03/2014		Yes	No
Protocol article	protocol	22/03/2014		Yes	No
HRA research summary	Participant information sheet		28/06/2023	No	No
Participant information sheet		11/11/2025	11/11/2025	No	Yes