

Table 1. Summary of VR Intervention Procedures Reported to the TIDIER Framework

Study	Intervention Type	Procedure	Who	How	Where	When and How much?	Tailoring
Mohammad 2019 [29]	Environment-based Relaxing VR	Unspecified immersive VR headset. Operating 'Ocean Rift' or 'Happy Place' VR software	Principal investigator (Nurse) intervention provider	Individual face-face VR intervention	Clinical Setting Specialised cancer centre Jordan	Single intervention 20-30 minute VR intervention began following administration of drug and stopped at peak drug dose	Patient could choose VR software

Chirico 2020 [30]	Environment-based Relaxing VR	Vuzix Wrap 1200 VR headset with controller. Second Life VR software (nature scenes: island exploration; walking through forest; observing animals; climbing a mountain; sea swimming)	Psychologist and Research Nurse intervention providers	Individual face-face VR intervention	Clinical setting National cancer institute Italy	Single intervention 5-10 minute familiarisation period 20 minute VR session	Patient could choose VR scenario
Giap 2019 [31]	Environment-based Relaxing VR	Unspecified immersive VR with BMS, biometric sensors and portable peddler Unspecified VR platform (different environments: Royal garden; safari park; Land of Dinosaurs and Dragons)	Unspecified intervention provider	Self-administered VR intervention	Domestic setting USA	15-30 minute duration 5 days a week for two weeks	Patient could choose VR scenario Any over exertion measured by physical parameters resulted in pause to VR
Glennon 2018 [32]	Environment-based Relaxing VR	ezVision X4 VR headset	Nurse and unspecified intervention provider	Face-face VR intervention administered to	Clinical setting	Single intervention 15 minute duration	Patient could choose VR scenario

		Unspecified VR platform (relaxing nature scenes: babbling brooks; swaying palm trees; undersea life)		haematological patients undergoing bone marrow aspiration and biopsy	Outpatient cancer centre USA		
Scates 2020 [33]	Environment-based Relaxing VR	Zeiss VR One Glasses VR headset Unspecified VR software (nature scenes: trees, water features, creeks, animals and parks)	Oncology nurse and unspecified intervention providers	Face-face VR intervention administered to cancer patients undergoing CTH infusion treatment	Clinical setting Cancer centre US	Single intervention 7-14 minute duration	Patient could choose VR scenario
Nasirzadeh 2020 [34]	Environment-based Relaxing VR Distraction intervention	VR Box 2 Unspecified VR platform displaying relaxing images	Unspecified intervention provider	Face-face VR intervention administered to patients undergoing haemodialysis	Clinical setting Iran	20 minute VR intervention, weekly for two weeks	None

Ashley 2021 [35]	Environment-based Relaxing VR	Nature Treks software, deployed on an Oculus Quest Head Mounted Display	Unspecified intervention provider	Individual face-face VR intervention administered to cancer patients undergoing chemotherapy	Clinical setting USA	Patients were instructed to wear the headset for a minimum of 5-to-15-min intervals as tolerated throughout their infusion. Maximum allowed usage of VR headset: 150minutes	Patients were able to choose between 9 different interactive natural environments.
Garcia 2016 [36]	Environment-based Relaxing VR with integrated relaxation training (mindfulness techniques)	Unspecified immersive VR headset Unspecified VR software	Unspecified intervention provider	Individual face-face VR intervention administered to cancer patients undergoing chemotherapy	Clinical setting Spain	3 VR intervention sessions Unspecified duration	None
van Ooteghem 2019 [37]	Environment-based Relaxing VR Hypnotherapy intervention	Unspecified VR headset Oncomfort VR software	Unspecified intervention provider	Face-face VR intervention administered to MANIV patients-connected to a	Clinical setting Belgium	Single intervention 10 -20 minute duration	None

					mechanical ventilator		
Burrows 2020 [38]	Environment-based Relaxing VR with integrated relaxation techniques (psychoeducation and mindfulness)	Oculus Rift VR Headset Unspecified VR software (psychoeducation and meditation exercises)	Unspecified intervention provider	Face-face VR intervention administered to patients undergoing haemodialysis	Clinical setting Haemodialysis Hospital setting USA	20 minute VR intervention, weekly for two weeks.	None
Schneider 2003 [39]	Game-based Relaxing VR	Sony PC Glasstron PLM-S700 VR headset Oceans Below; A World of Art; Titanic Adventure; Out of Time VR software	Unspecified researcher intervention provider	Face-face VR intervention administered to breast cancer female undergoing CTH infusion treatment	Clinical setting USA	Single intervention 10-115 minute duration	Patient could choose VR scenario

Schneider 2004 [40]	Game-based Relaxing VR	Sony PC Glasstron PLM- S700 VR headset Oceans Below; A World of Art; Titanic Adventure; Out of Time VR software	Unspecified researcher intervention provider	Face-face VR intervention administered to breast cancer female undergoing CTH infusion treatment	Clinical setting Cancer centre USA	Single intervention 5-10 minute familiarisation period 45-90 minute duration	Patient could choose VR scenario
Schneider 2007 [41]	Game-based Relaxing VR Distraction intervention	Sony PC Glasstron PLM- S700 VR headset Oceans Below; A World of Art; Titanic Adventure; Out of Time VR software	Research Nurse intervention provider	Face-face VR intervention administered to breast cancer female undergoing CTH infusion treatment	Clinical setting Cancer centre USA	Single intervention 5-10 minute familiarisation period 45-90 minute duration	Patient could choose VR scenario
Lewandowski 2021 [42]	Game-based Relaxing VR Distraction intervention that provides a sense of control	Samsung VR headset and gut healing application game	Unspecified intervention provider	Face to face VR intervention administered during vedolizumab infusion	Clinical setting Poland	Single intervention for 15 min during vedolizumab infusion.	None

Niki 2019 [43]	Environment-based Relaxing VR	HTC Hive VR headset Google Earth VR software	Unspecified medical staff intervention providers	Face-face VR intervention administered to terminal cancer patients	Palliative care ward Japan	Single intervention 30 minute duration	Patient could choose VR scenario
Pizzoli 2019 [44]	Environment-based Relaxing VR With integrated relaxation techniques (mindfulness/respiration control)	iHarbot headmounted display VR headset Unreal Engine VR software (waterfall scene with integrated guided relaxation)	Unspecified researcher intervention provider	Face-face VR intervention administered to breast cancer females	University Clinic Italy	Single intervention 14 minute duration	None
Ferguson 2020 [53]	Environment-based Relaxing VR	Unspecified VR headset YouTube VR® software (360 beach scenes)	Unspecified researcher intervention provider	Face-face VR intervention	Community hospice USA	Single intervention Mean 12.4 minutes duration (0.2-31 minute)	None

Rose 2019 [54]	Environment- based Relaxing VR	Samsung Gear VR® headset Unspecified VR software (relaxing scenes: forest; countryside; sandy beach; rocky beach; cathedral)	Unspecified researcher, unspecified clinician, and care giver intervention providers	Face-face VR intervention	Inpatient psychiatric hospital UK	Single intervention 7-15 minute duration	Patient could choose VR scenario
Tabbaa 2019 [55]	Environment- based Relaxing VR	Samsung Gear VR® Headset Unspecified VR software (relaxing scenes: forest; countryside; sandy beach; rocky beach; cathedral)	Unspecified researcher, unspecified clinician, and care giver intervention providers	Face-face VR intervention	Secure psychiatric hospital UK	Single intervention 15 minute duration	Patient could choose VR scenario

Coelho 2020 [56]	Environment- based Relaxing VR based on reminiscence intervention	Samsung Gear VR with a Samsung S7 smartphone and the Oculus Rift headsets A GoPro Fusion 360 camera was used to film the selected locations for the reminiscence videos	Assisted by a previously trained researcher with experience in reminiscence therapy	Face to face VR intervention	Health and social care institutions or university setting Portugal	Intervention consisted of four individual reminiscence sessions, conducted over two weeks Maximum duration of of exposure to videos was 15 minutes	Reminiscence videos were based on pre- intervention interviews with patients and carers about patient's past life experiences.
Kelleher 2022 [51]	Environment- based Relaxing VR	VR Blue was implemented using "theBlu" Season 1, (calming scenic graphics of underwater/sea environments and relaxing nature music).	Participant introduced to equipment by a study team member	Face to face VR intervention	Cancer Institute USA	Single 30 min session	None

Appel 2020 [57]	Environment-based Relaxing VR	Samsung Gear VR head-mounted display (HMD) and Sennheiser HD 221 headphones. 5 nature films on a loop (lakeshore, forest, icebergs, beach)	RC helped participant put on and remove the HMD and headphones.	Face to face VR intervention	Hospital setting Canada	Sequence of five nature films on a loop lasting a total of 6 min.	None
Groninger 2021 [45]	Environment-based Relaxing VR	Facebook Oculus Go. VR software: Forest of Serenity (Holosphere VR) free application	Administered at the bedside by the study coordinator	Face to face VR intervention	Hospital setting USA	10-minute guide through a forest and waterfall with voice narration	None
Jozwik 2021 [46]	Environment-based Relaxing VR	VR TierOne device. VR goggles (HTC VIVE PRO) Based on the metaphor of a Virtual Therapeutic Garden	Not identified	Face to face VR intervention	Clinic setting Poland	8 sessions about 20 mins each	None

Maciolek 2020 [47]	Environment- based Relaxing VR	Apple iPhone 5S. Google Cardboard-type VR glasses. RelaxVR application, which generates a natural virtual landscape model accompanied by relaxation music	Psychologist	Face to face VR intervention	Clinic setting Poland	Six 20 minute sessions	None
Rutkowski 2021 [48]	Environment- based Relaxing VR	VR TierOne device. VR goggles (HTC VIVE PRO) Based on the metaphor of a Virtual Therapeutic Garden	Not identified	Face to face VR intervention	Hospital setting Poland	10 sessions of 20 minutes (5 times a week for 2 weeks)	None

Reynolds 2022 [49]	Environment-based Relaxing VR	Pico Goblin VR headset. Panasonic RP-HT161 headphones. Two different VR interventions: Happy Place (tranquil camping scene) and Ripple (beach, waterfall and mountain range)	Written instructions	Participants at home following written instructions	Participants at home New Zealand	During the intervention weeks, participants were instructed to use the VR experience every day for a minimum of 10 min.	None
Szczepanska-Gieracha 2021 [50]	Environment-based Relaxing VR	VR TierOne device. VR goggles (HTC VIVE PRO) Based on the metaphor of a Virtual Therapeutic Garden	Physical therapist	Face to face VR intervention	Cardiac clinic Poland	Twice a week for 4 weeks; each session 20 minutes	None
O'Gara 2022 [52]	Environment-based Relaxing VR	3D glasses, a headset with integrated screen, or gloves with integrated sensors incorporating compassionate mind training	Not identified	Face to face	Clinic setting UK	3 sessions (each lasted between 7 and 16 minutes)	None

Shaw 2019 [58]	Mixed Game-based or Environment- based Relaxing VR Distraction intervention & integrated relaxation (mindfulness)	HTC Vive Pro VR® headset Karuna Labs Inc. Virtual Embodiment Training® or “SnowWorld”® VR software	Unspecified intervention provider	Face-face VR intervention	Clinical setting USA	30 minute VR intervention, with 5 minutes of VR guided meditation weekly for 8 weeks.	Patients randomly assigned to Game-based or Environment- based VR intervention
Shaw 2019 [59]	Mixed Game-based or Environment- based Relaxing VR Distraction intervention & integrated relaxation (mindfulness)	HTC Vive Pro VR® headset Unspecified VR software	Unspecified intervention provider	Face-face VR intervention	Unspecified setting USA	30 minute VR intervention with 5 minutes of VR guided meditation weekly for 8 weeks.	Patients randomly assigned to Game-based or Environment- based VR intervention

