Virtual reality in palliative care: a systematic review and meta-analysis

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Databases: from inception up until 26th March 2021:

- Ovid platform: Medline, Embase, AMED, PsycINFO (OVID)
- CINAHL (EBSCOhost)
- Cochrane Central Register of Controlled Trials (CENTRAL)
- Web of Science
- OpenGrey – unpublished work.

FULL PROTOCOL

SCAN ME

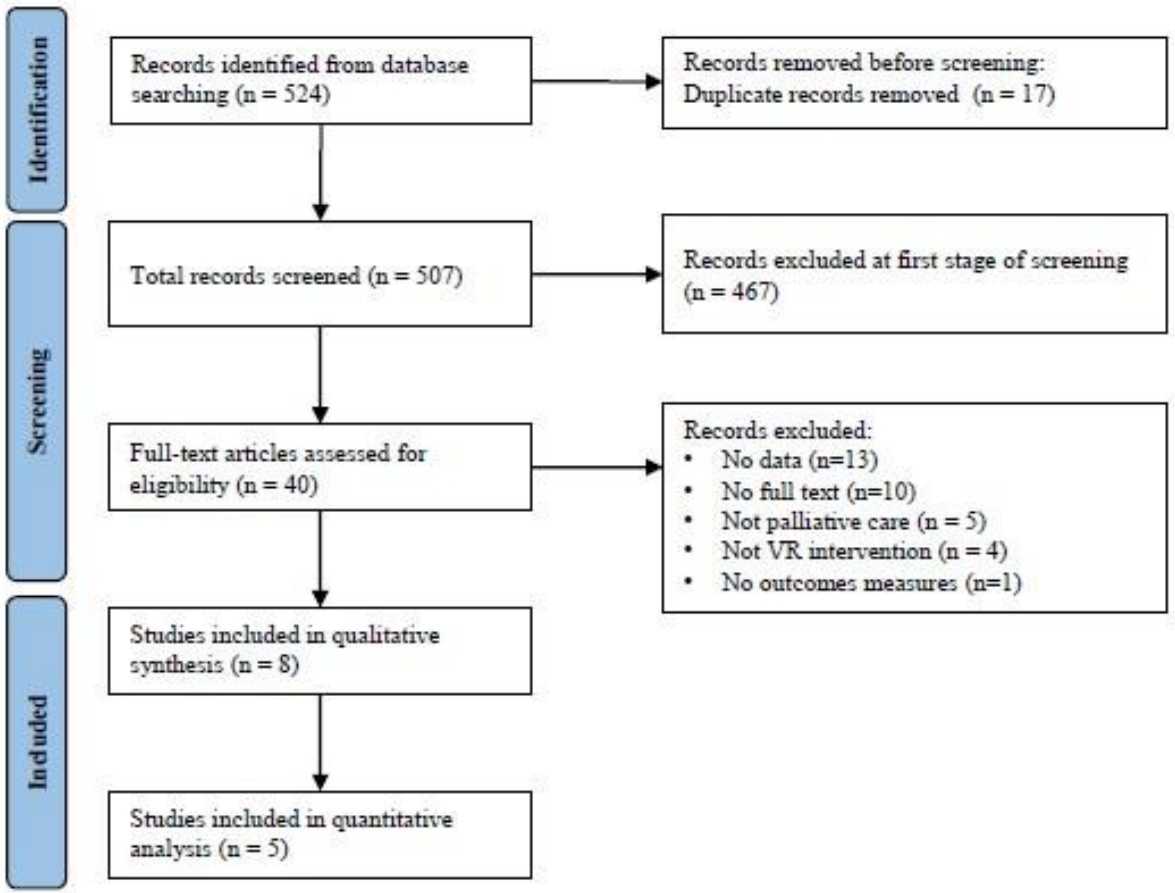
Search terms: The search combined two concepts:

1) “Palliative care” and 2) “Virtual reality”.

Country: 5 USA, 1 Spain, 1 Japan, 1 UK.

Date: 2012 – 2021 [1-38]

Figure 1. PRISMA flowchart



Setting: 3 hospital inpatient, 1 outpatient, 1 multiple, 3 palliative care (either hospice or ward).

Participant Characteristics				
Diagnosis		Gender		Age
		Male	Female	
	n (%)	n (%)		Mean (SD)
Cancer	19 (100)	10 (53)	9 (47)	60.9 (14.5)
Cancer Heart failure End-stage renal	14 (61) 7 (30) 2 (9)	11 (48)	12 (52)	47.7 (17.1)
Cancer	12 (100)	5 (42)	7 (58)	24-65+*
Dementia	25 (100)	3 (12)	22 (88)	85 (8.9)
Heart failure	88 (100)	44 (50)	44 (50)	56 (13.2)
Cancer Heart failure Bronchiectasis Pneumonia	8 (67) 2 (17) 1 (8) 1 (8)	4 (33)	8 (67)	72 (16)
Cancer	20 (100)	14 (70)	6 (30)	72.3 (11.9)
Cancer Other	15 (75) 5 (25)	6 (30)	14 (70)	66*

* age range / Perna *et al.* did not report SD

First Author	Intervention	Comparator	Technology	Duration of treatment	Follow-up
Randomised Controlled Trials					
Groninger	Guided walk-in virtual environment with narration	Active control (guided imagery)	Oculus Go VR headset	One 10-min session	Same day

Perna	Personalised VR experience based on participants preference	Non- personalised VR experiences	Google Daydream headset; Google Pixel XL smartphone and headphones.	Four 4-min/wk	1 VR session/wk for 4 wks
Non-Randomised Controlled trials					
Baños	Navigation through virtual environment to induce joy and relaxation	Pre-post data	LCD screen connected to a computer; headphone, keyboard, mouse	Four 30-min sessions/1 wk	4 times/wk
Brungardt	Virtual-based music therapy with customised soundtrack	None	Oculus Go VR headset	One approx. 30-min session	Same day
Dang	VR-based life review using synchronised personalised avatar	Pre-post data	MoCap (Motion capture device); VocingHan hardware; Logitech wireless headset	One approx. 30-min session	1-month
Ferguson	VR-based 360-degree beach viewing	Pre-post data	Lenovo's Mirage Solo VR headset with business edition	One 30-min session	3-5 hours after invention (behavioural changes only)
Johnson	VR still images /animated videos viewing using 1 or more VR applications in Oculus Library	Pre-post data	Samsung Gear VR	One 30-min session	None
Niki	VR travel to the destination according to participants' wishes	Pre-post data	VR headset HTC VIVE and VR software Google Earth VR	One 30-min session (time shortened or extended as needed)	None

	First Authors							
	Brungardt	**Dang**	**Ferguson**	**Baños**	**Groninger**	**Johnson**	**Niki**	**Perna**
Domains								
Feasibility	✓	✓		✓				✓
Acceptability	✓	✓	✓	✓	✓	✓	✓	✓
Usability	✓	✓	✓	✓		✓		
Pain		✓		✓	✓	✓	✓	✓
Mood				✓[1]				
Anxiety		✓		✓		✓	✓	✓
Depression		✓				✓	✓	✓
Psychological wellbeing		✓				✓	✓	✓
Other physical symptoms		✓[4]		✓[2]	✓[3]	✓[4]	✓[4]	✓[4]
Other[4]		✓	✓		✓			

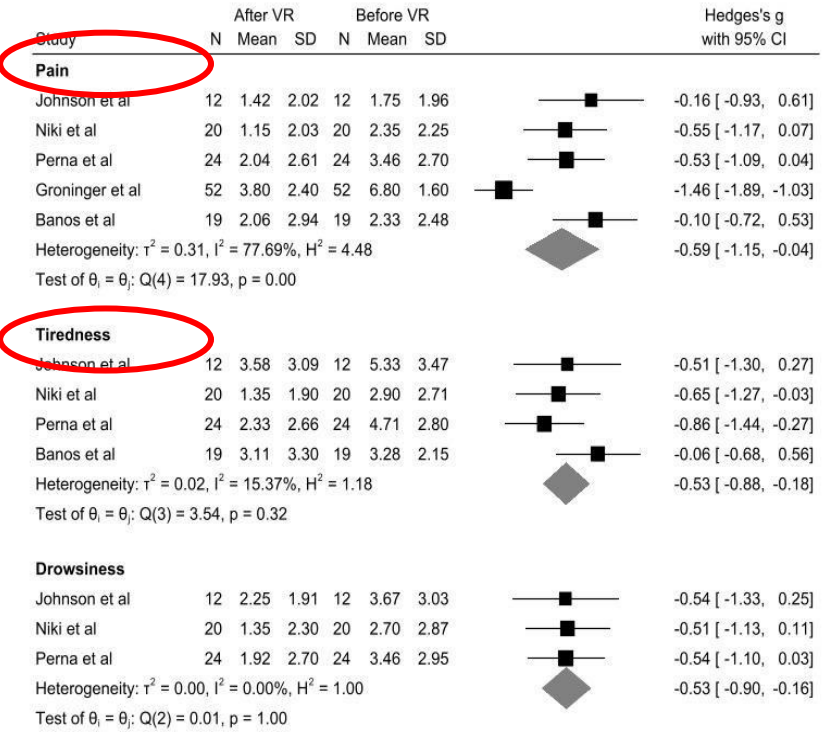
[1] Consisted of 7 items: joy, sadness, anxiety, relax, vigor (1 “not at all” to 7 “completely”), general mood (scale of 1-7 where 7 was equivalent to positive mood and well-being), and subjective mood change (from -3 “much worse” to +3 “much better”)

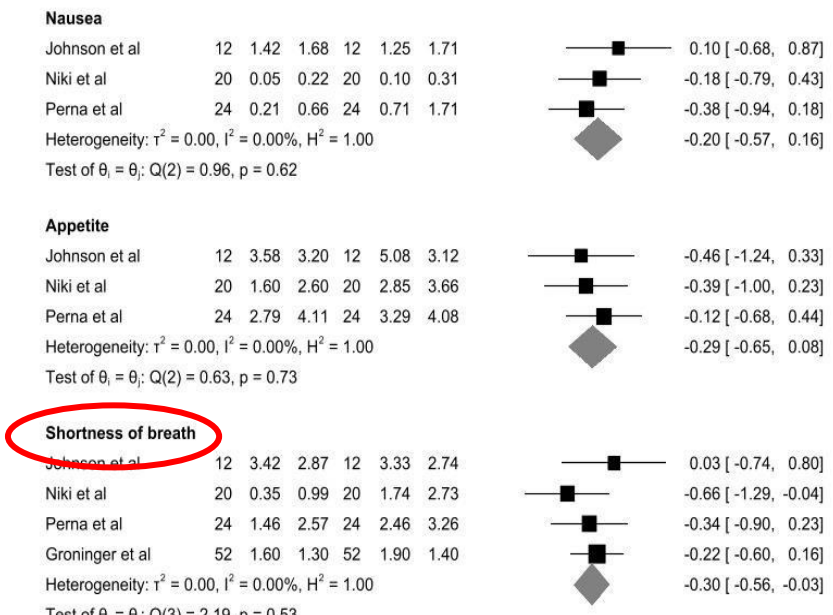
[2] Consisted of fatigue, pain, and physical discomfort (0 “not at all” to 10 “very much so”).

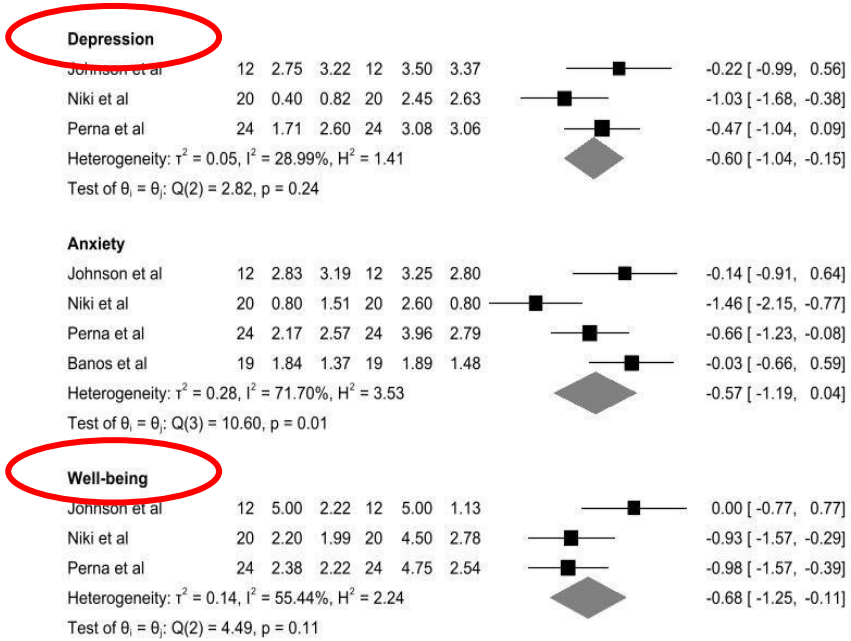
[3] Subdomains of the FACIT-Pal-14: shortness of breath, distress (0 “not at all” to 4 “very much”). [4] As measured by the ESAS-r.

[4] Dang et al., included measures of Health-related quality of life, symptom burden, and spiritual wellbeing; Ferguson et al., measured behavioural changes after the VR session; Groninger et al. also measured quality of life.

Feasibility and acceptability







Conclusions

VR in palliative care is feasible and acceptable.VR could be an adjuvant non-pharmacological therapy for symptoms such as anxiety, pain, or depression.

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