Physio Posture Fitness

spine&pain

Virtual Reality Exergaming in CLBP

PILOT TRIAL OF IMMERSIVE VS NON-IMMERSIVE GAME PLAY

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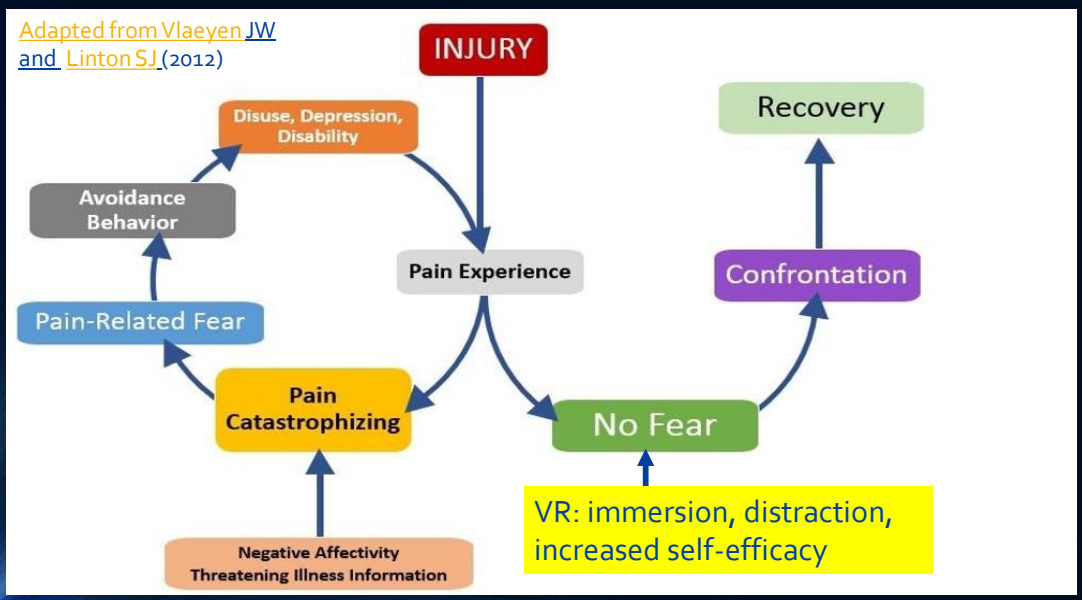
VR in other clinical areas:

- Stroke rehabilitation
- Falls prevention
- Anxiety
- Procedural pain
- Burns
- SCI

Why VR exergaming for CLBP?

- Over $1.2 billion spent annually on treating CLBP in Australia (AIHW 2016)
- Treatment barriers include patient motivation, low mood and fear of movement, as well as access to physiotherapy (Booth et al 2017).

Fear-avoidance model of chronic musculoskeletal pain



Research questions:

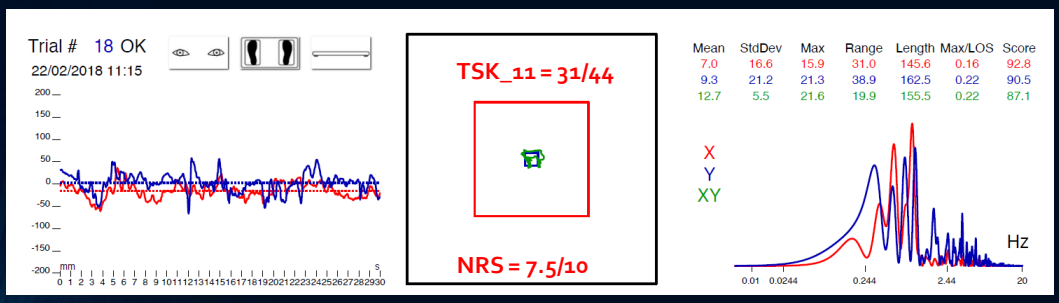
- Is a headset (immersive VR) going to be well tolerated in this population?
- Will VR be an accepted potential rehabilitation tool in this population?
- Which will encourage more movement in game play, immersive or non-immersive VR?

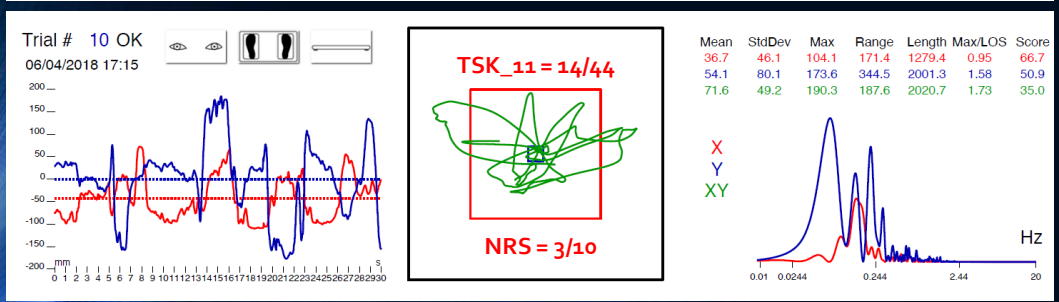
Method:

- 20 participants with CLBP recruited from 2 Sydney clinics
- Baseline and game play postural sway data collected
- VICOVR system used to play 'MoonBird' either wearing a headset or on a TV screen
- Questionnaires: Kinesiophobia (TSK-11) and User perception survey (Gil-Gomez et al 2013)

VR game play

Postural Sway Data in NIVR





Postural Sway Data Analysis: Repeated Measures model

Variables: LengthXYmean => overall amount of movement from centre normalised against volitional limits in modes VR and NIVR

Covariates:

- TSK (kinesiophobia)
- NRS (pain score)
- Romberg (sway eyes closed: eyes open) => a measure of postural instability

NIVR mean = 1134.16 mm [SD 447.27] and VR mean = 897.57 mm [SD 311.98]. Significant p=0.017 difference between NIVR and VR motion within each individual.

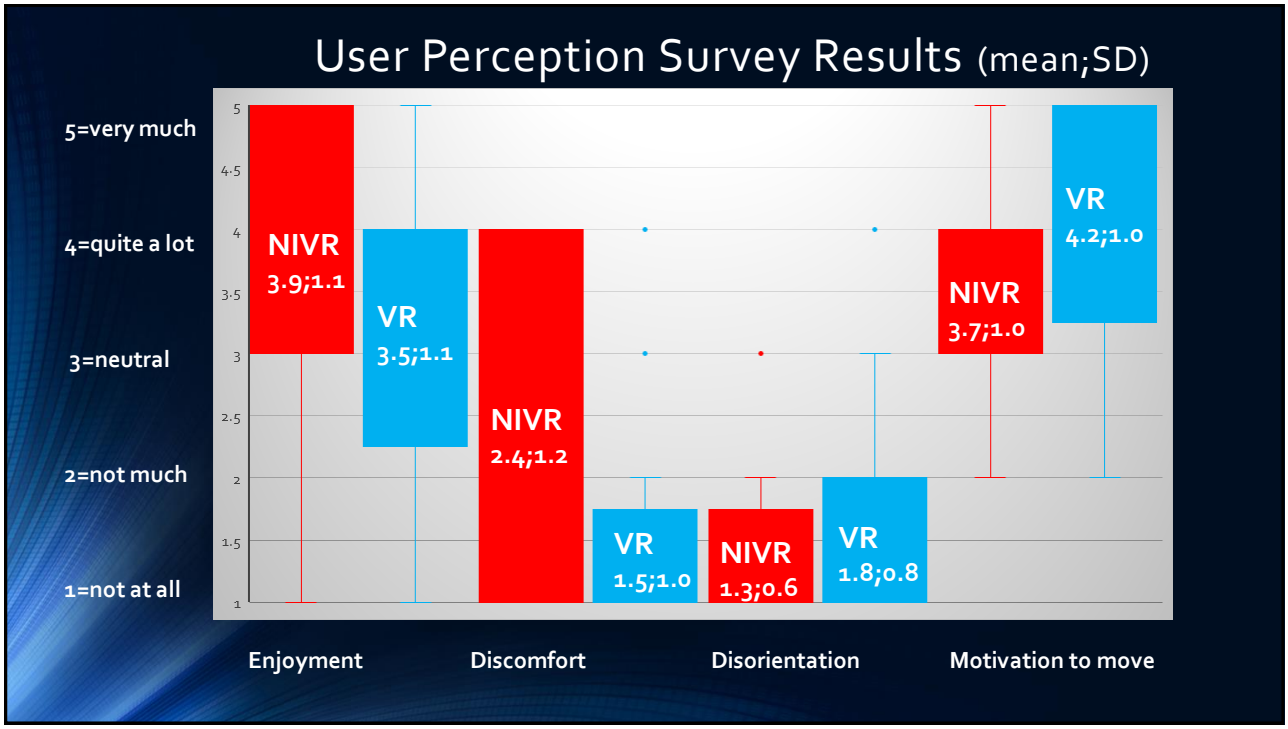
Postural Sway Data Analysis:

Covariable	Between Participants	Each individual
TSK	**p =0 .004**	p= 0.76
Initial NRS	**p= 0.012**	p= 0.807
Rhomberg quotient	p=0.672	**p= 0.009**

⇒ Overall more movement in NIVR but high variation of movement

⇒ NRS and TSK do not predict the variation in movement between VR/NIVR within each individual, but the difference between individuals

⇒ Romberg score predicts differences within each individual



Implications:

- It is possible to gather objective movement data during therapeutic gaming
- VR is a well tolerated treatment option for those with CLBP
- For those that do not tolerate immersive VR, NIVR remains clinically useful and may even encourage greater amplitude of movement than immersive VR