InsomniaVR: A serious game pilot study exploring the effects of virtual reality on insomnia in individuals with spinal cord injury undergoing inpatient rehabilitation

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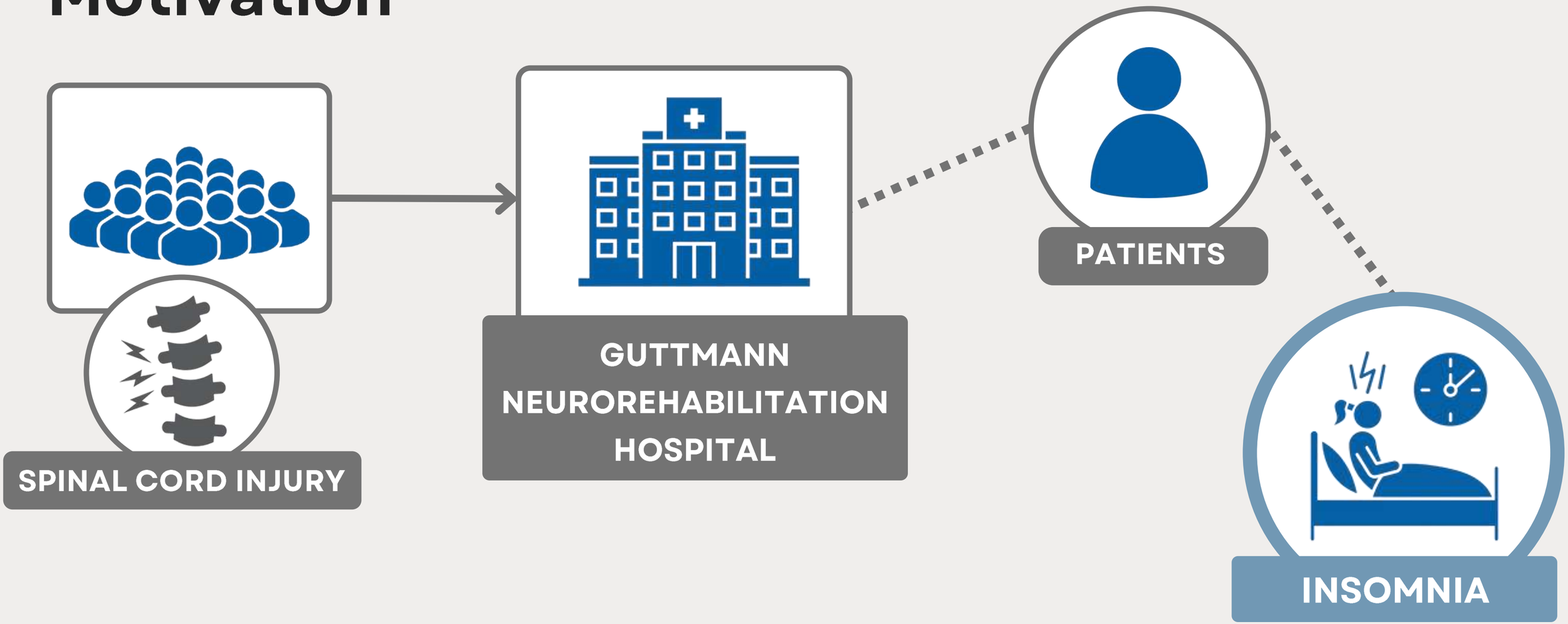
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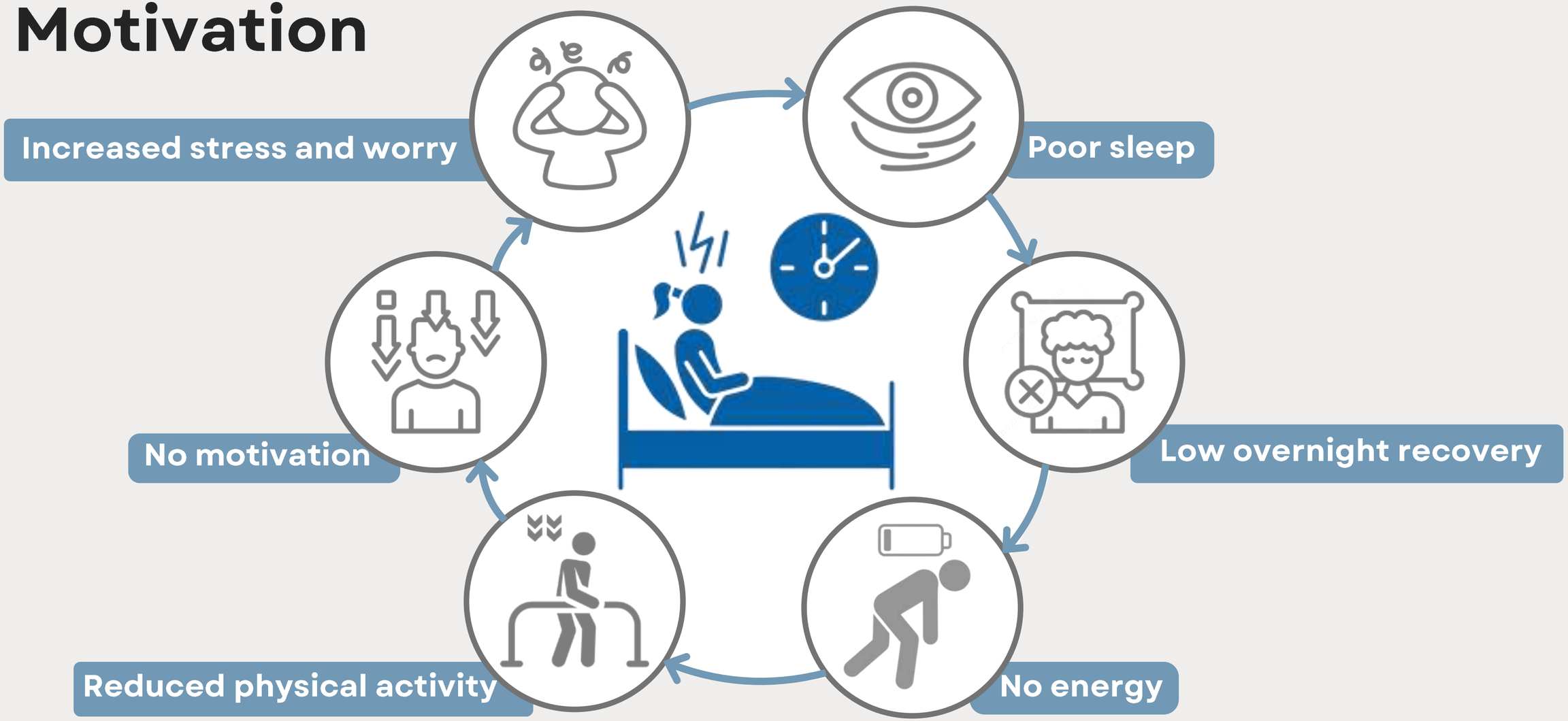
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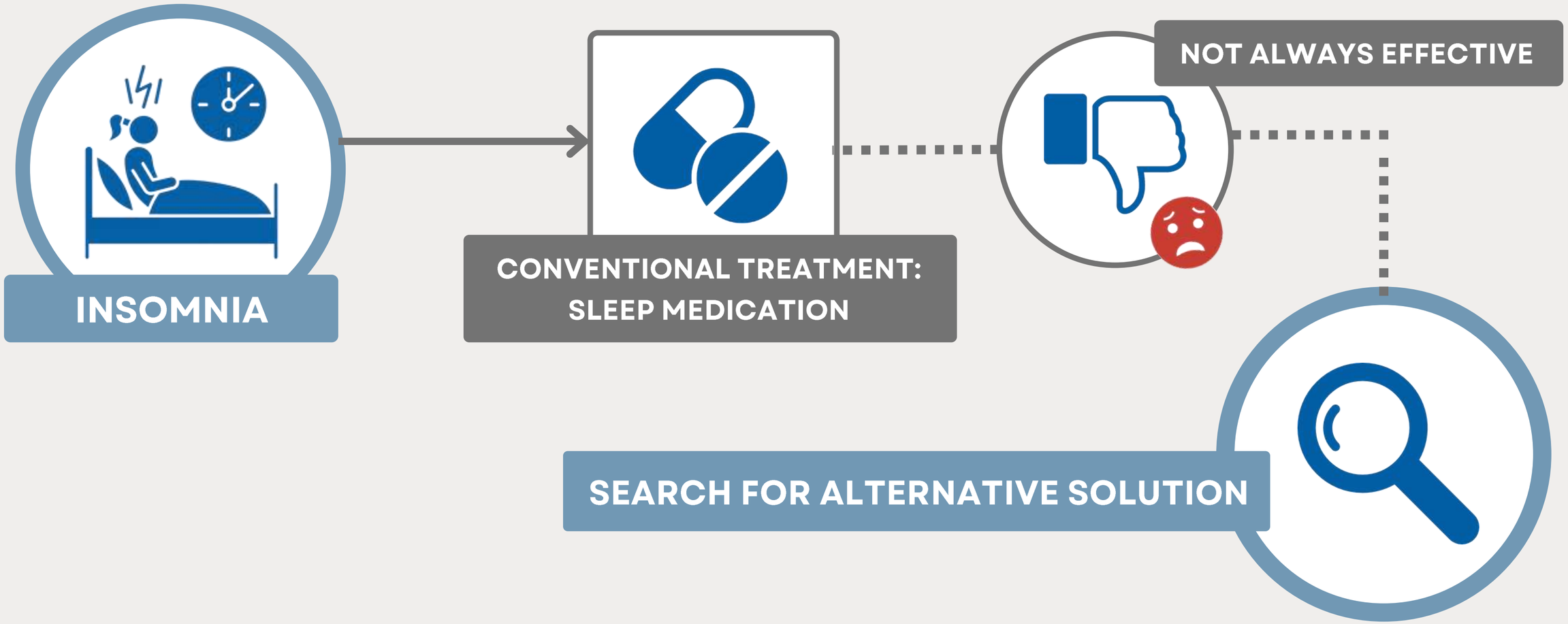
Motivation


SPINAL CORD INJURY
GUTTMANN NEUROREHABILITATION HOSPITAL
PATIENTS
INSOMNIA

Motivation


Increased stress and worry
Poor sleep
Low overnight recovery
No energy
Reduced physical activity
No motivation

Motivation


INSOMNIA
CONVENTIONAL TREATMENT: SLEEP MEDICATION
NOT ALWAYS EFFECTIVE
SEARCH FOR ALTERNATIVE SOLUTION

Our proposal



Our proposal

Relaxing

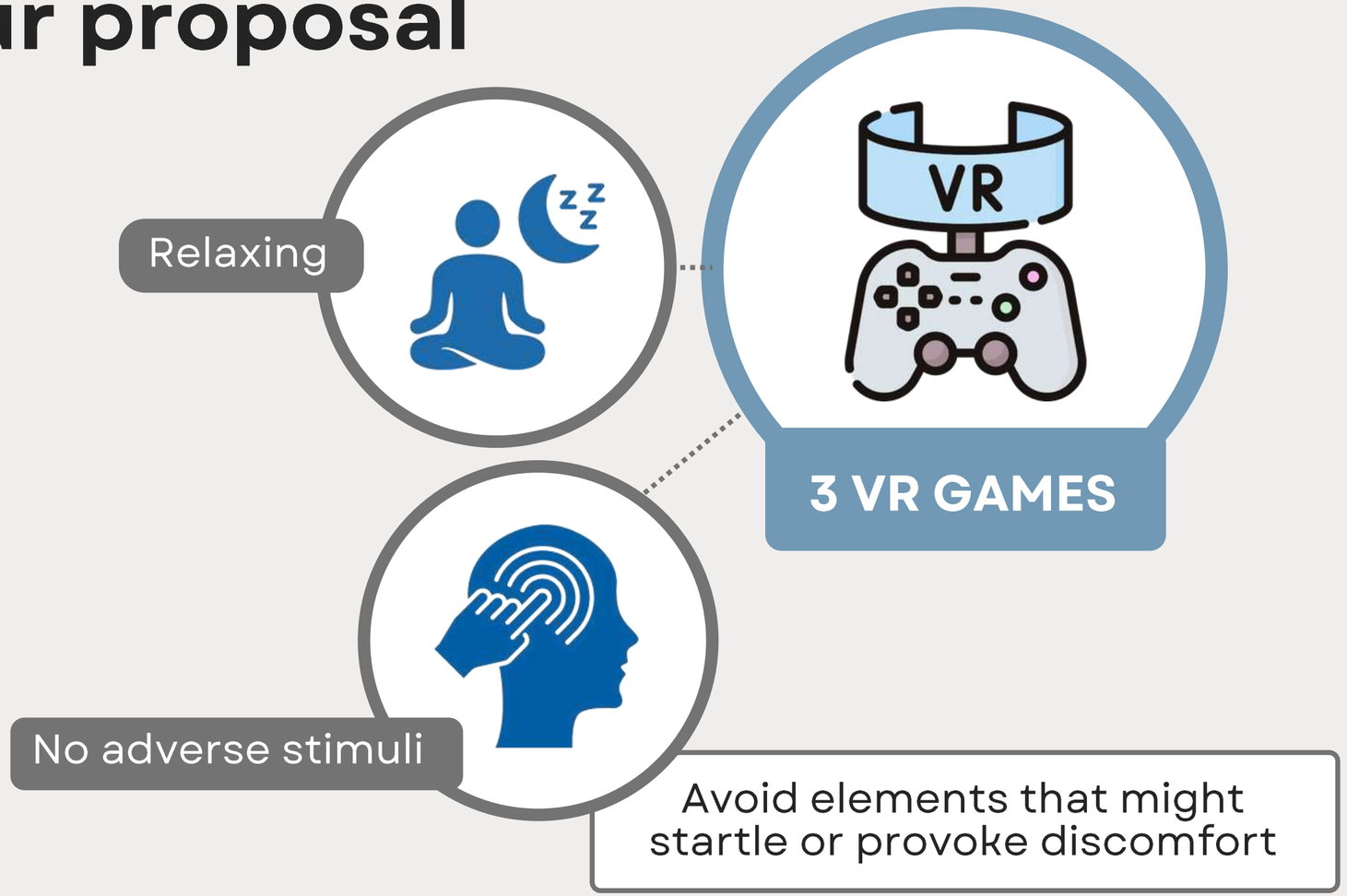
Slow-paced interaction to calm the nervous system



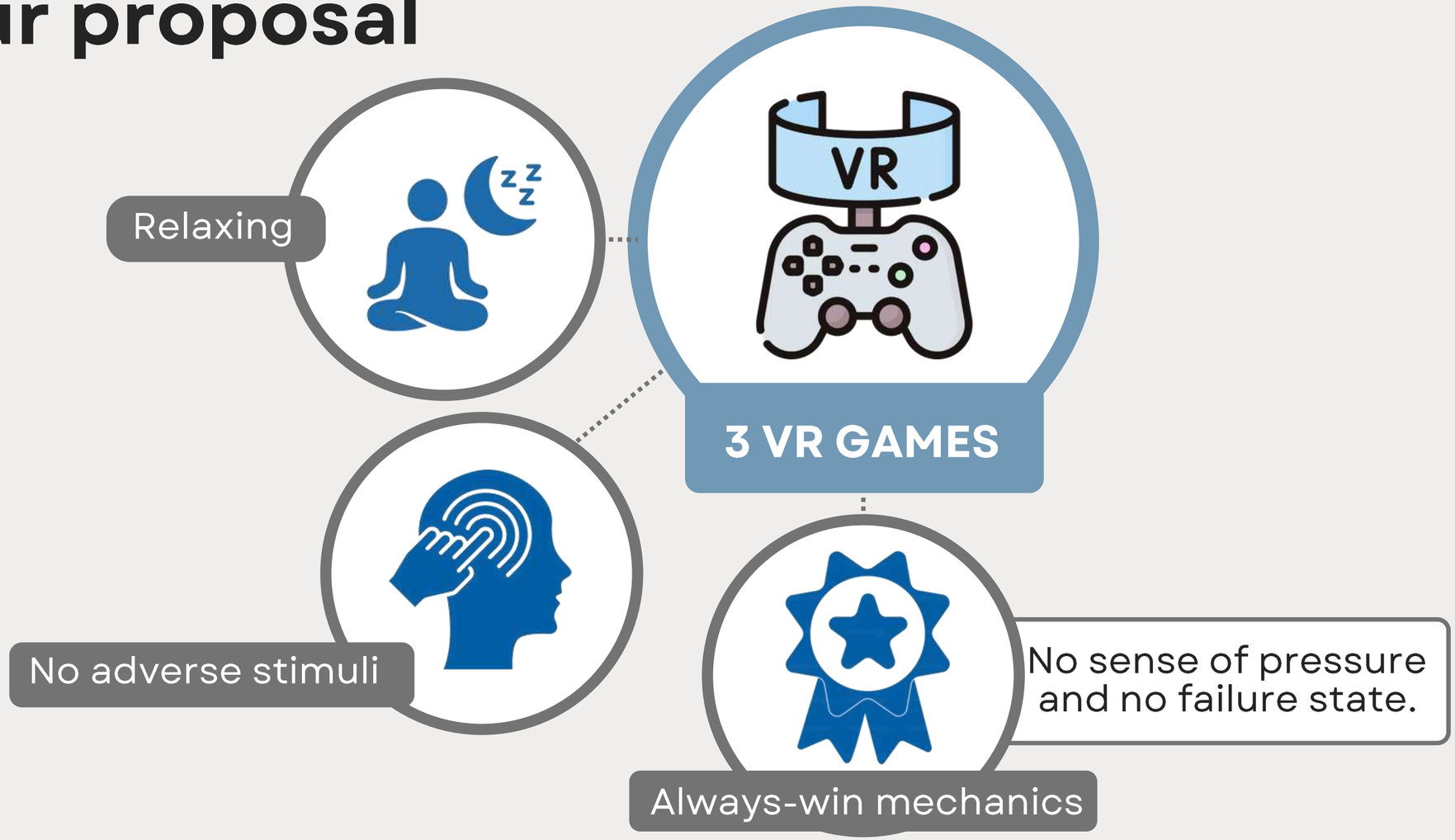


3 VR GAMES

Our proposal



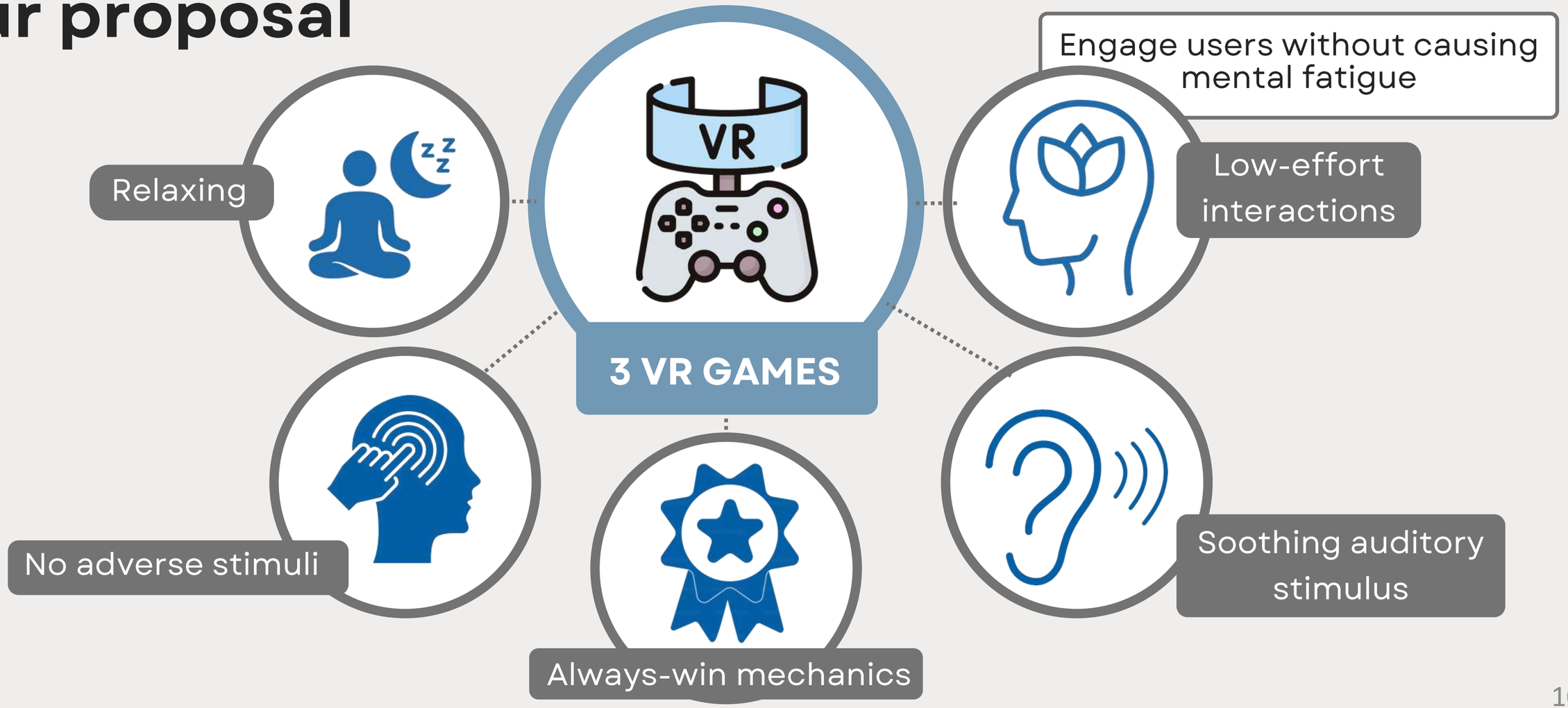
Our proposal



Our proposal



Our proposal



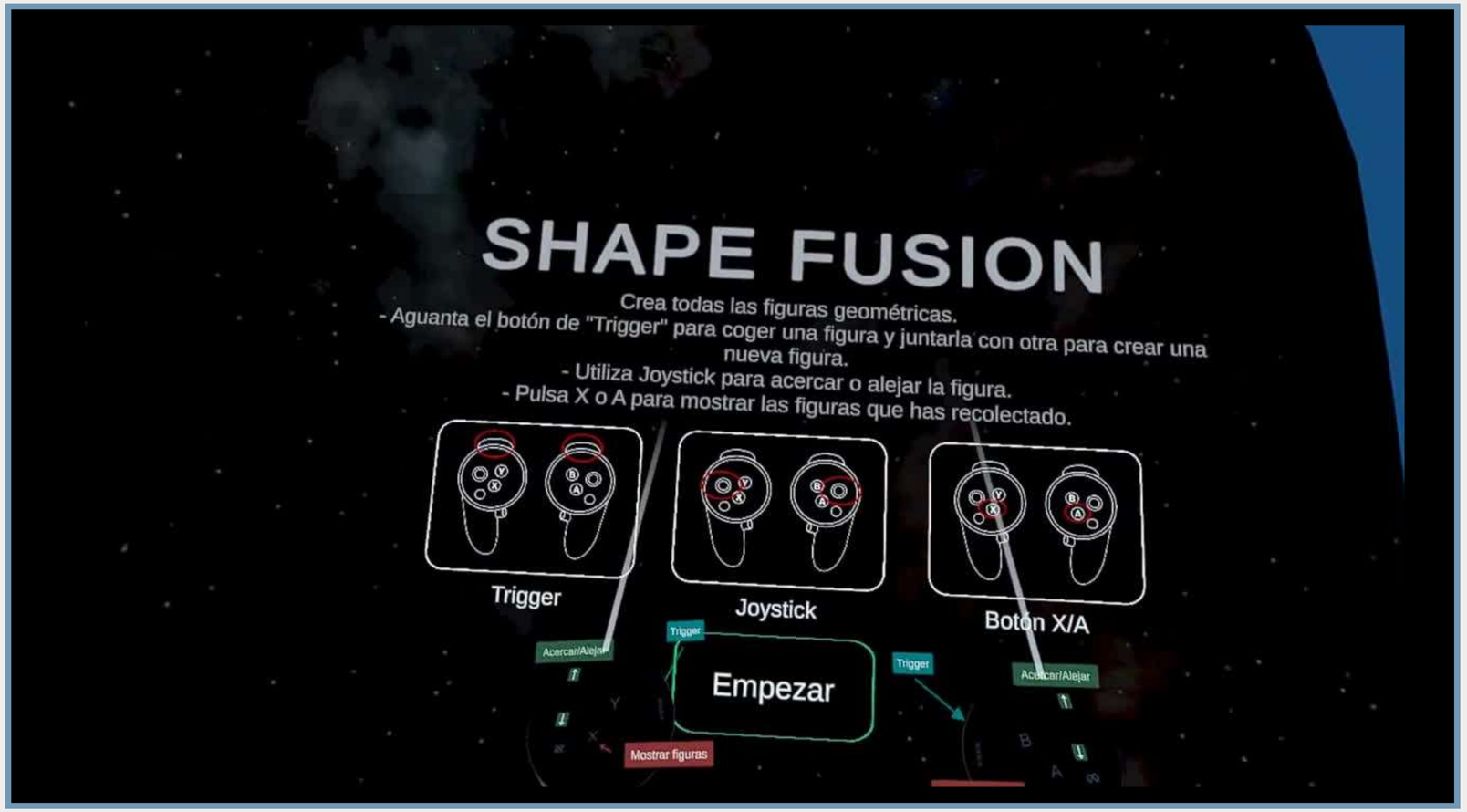
Game 1: The Mushroom forest



Game 2: Tap Away



Game 3: Shape Fusion



Experiment design



1

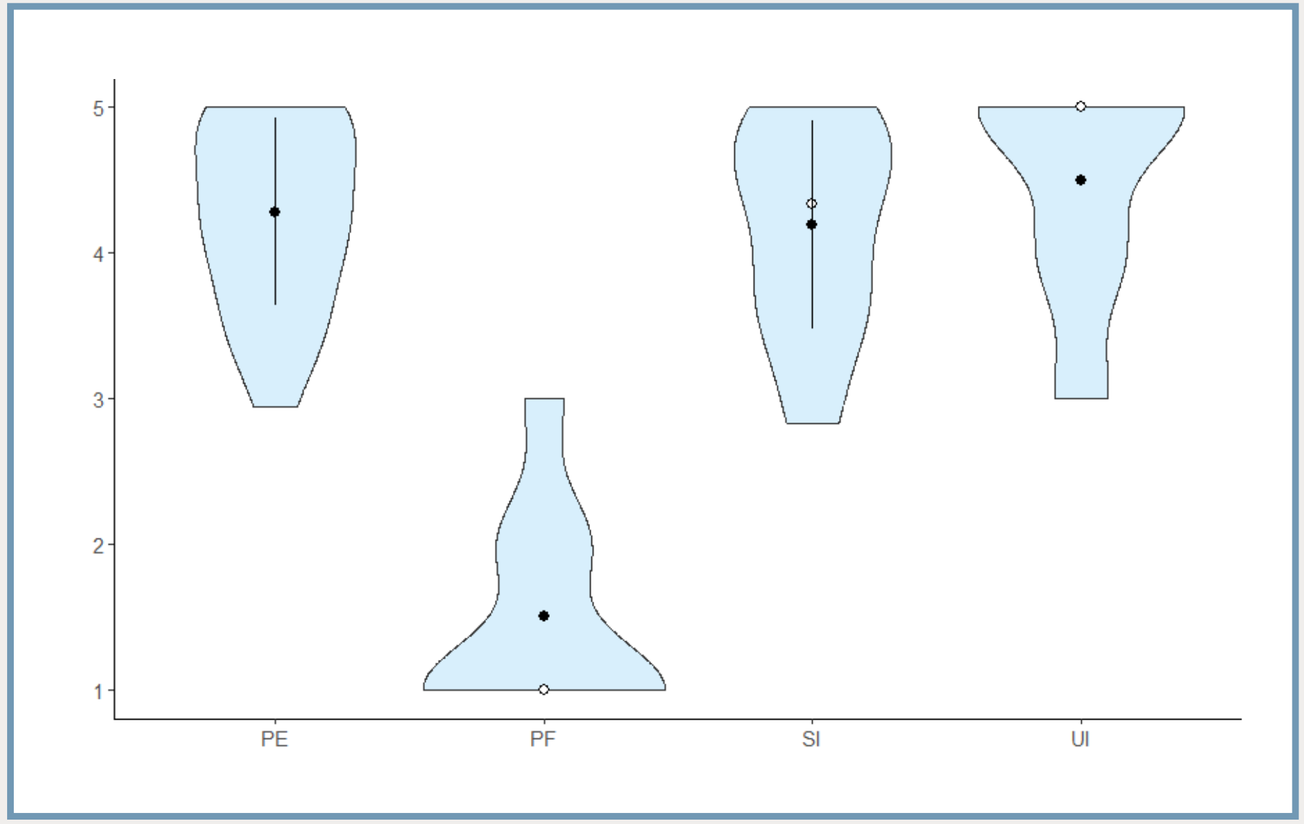
PILOT STUDY (N=20)

- Global Satisfaction score (GS) (Rating 1-10)
- Favourite game
- UX (User Experience) Questionnaire (Likert scale of 1-5)

CATEGORIES:

- PE: Perceived Enjoyment (3 Qs)
- PF: Perceived Frustration (1 Qs)
- SI: Sense of Immersion (6 Qs)
- UI: Usability and Intuitiveness (1 Qs)

Results - Pilot Study (N=20)



PE	PF	SI	UI	GS
4.2 ± 0.6	1.5 ± 0.7	4.1 ± 0.7	4.5 ± 0.8	9.0 ± 1.0

CATEGORIES:

- PE: Perceived Enjoyment
- PF: Perceived Frustration
- SI: Sense of Immersion
- UI: Usability and Intuitiveness

Experiment design

2

CLINICAL TRIAL (N=7)

DAY 1: START OF THE VR SESSIONS

- Athens Insomnia Scale (AIS)
- Pain Numerical Scale (PNS)

Daily Sleep Diary

DAY 15: END OF THE VR SESSIONS

- Athens Insomnia Scale (AIS) (8Q)
- Pain Numerical Scale (PNS)
- UX questionnaire (reduced) (Likert scale of 1-5)
- Global Satisfaction Score (GS) (Rating 1-10)
- Favourite game
- Semi-structured interview

Experiment design

2

CLINICAL TRIAL (N=7)



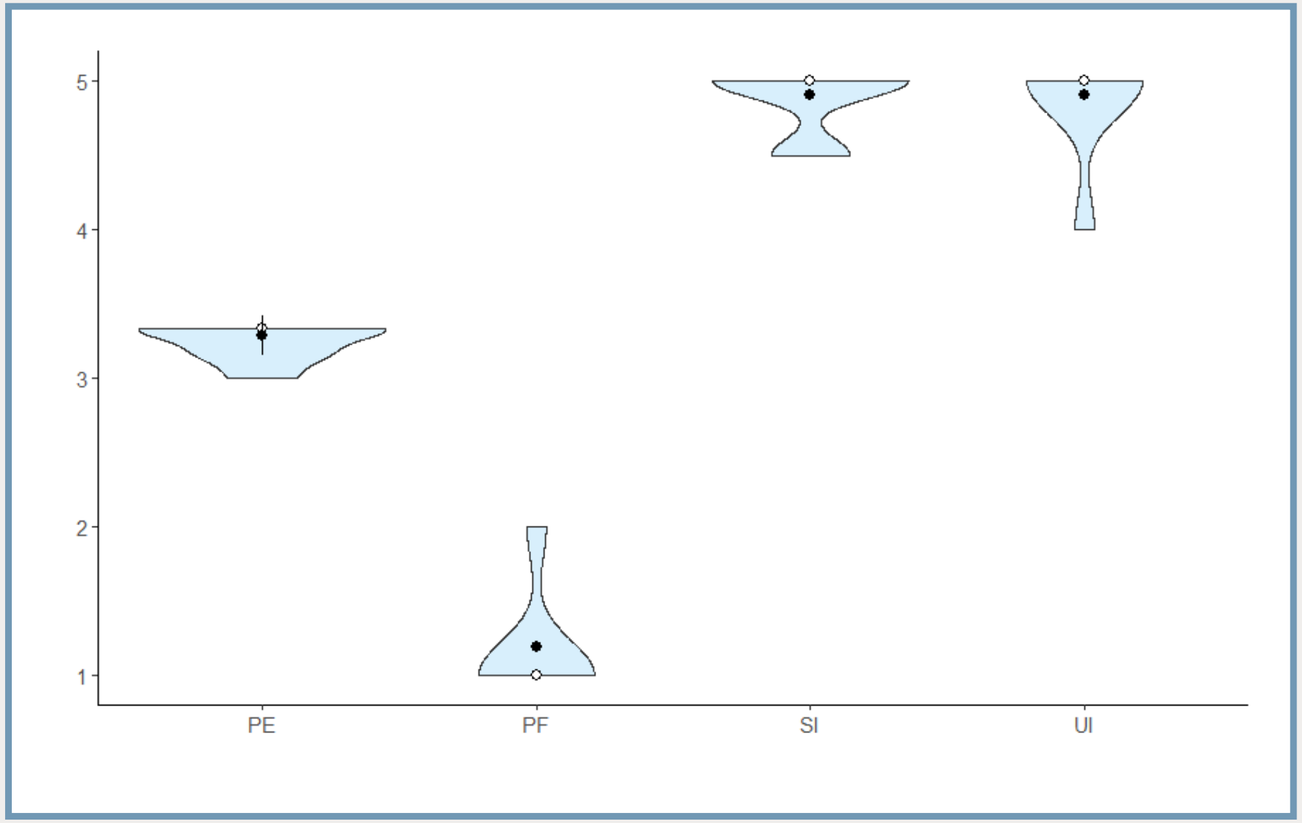
2 weeks
5 sessions x week

15- 20 min

Results - Clinical Trial (N=7)

			Baseline		Post-intervention	
Sex	Age	Sleep M.	AIS	PNS	AIS	PNS
Male	57	No	7	5	3	3
Male	54	Yes	21	5	2	5
Male	35	Yes	10	6	3	4
Female	62	No	13	3	7	1
Male	70	Yes	11	5	3	2
Male	26	No	10	6	2	2
Male	31	No	9	6	3	5

Results - Clinical Trial (N=7)

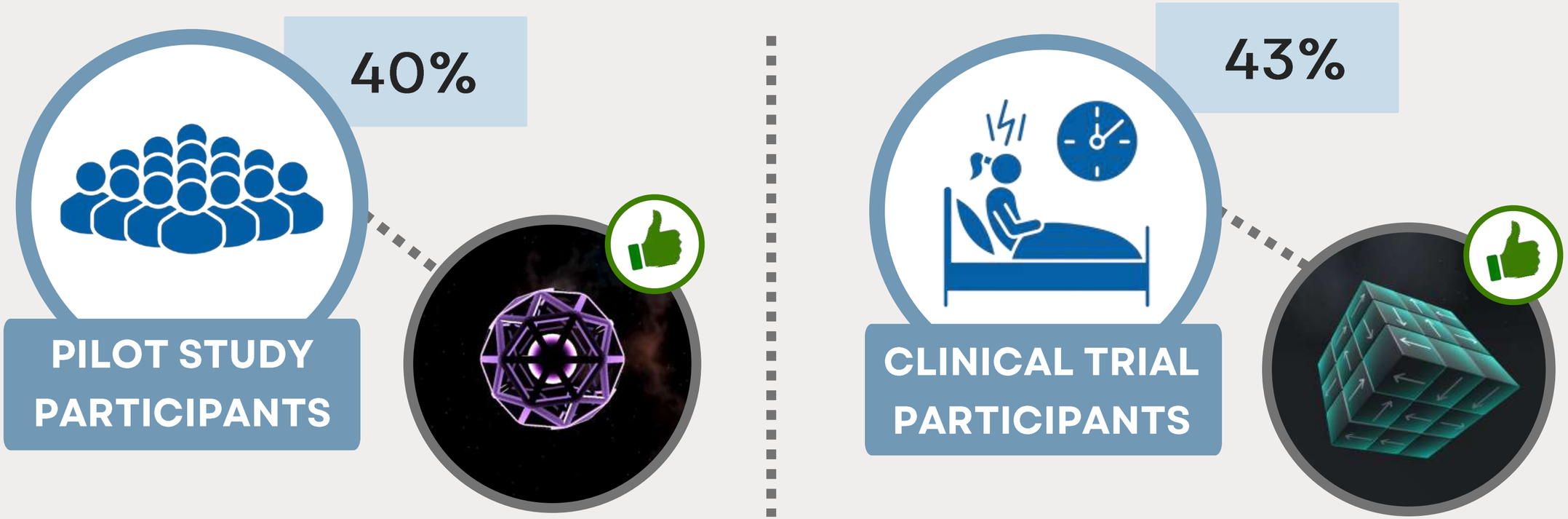


PE	PF	SI	UI	GS
3.2 ± 0.1	1.1 ± 0.4	4.9 ± 0.2	4.9 ± 0.4	9.7 ± 0.5

CATEGORIES:

- PE: Perceived Enjoyment
- PF: Perceived Frustration
- SI: Sense of Immersion
- UI: Usability and Intuitiveness

Results – Pilot Study vs Clinical Trial



Conclusion



High levels of acceptance

Positive feedback and satisfaction score

Future Work



Larger sample size



Robust statistical analysis



Physiological measurements



Better navigation system for bedridden individuals

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Thank you for listening!