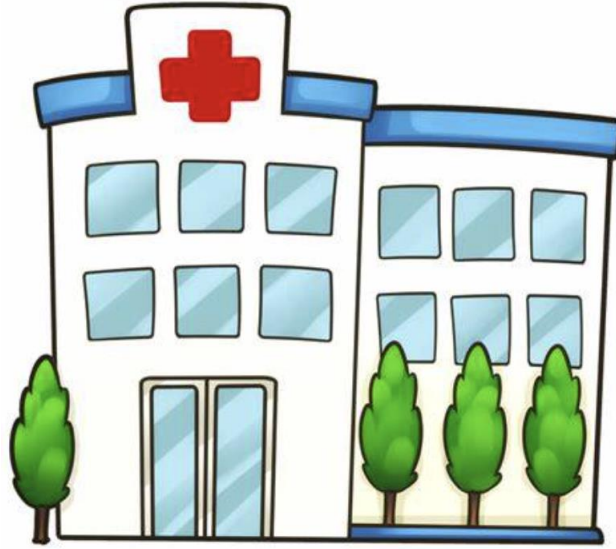


A Randomized Controlled Trial and Mediation Analysis of a Virtual Reality Psychological Intervention for Symptom Management in Hospital-Based Palliative Care

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「好想番屋企」

“I want to go home”

「好想去旅行」

“I want to travel”



Virtual Reality is defined as “an advanced form of human-computer interface that allows the user to interact with and become immersed in a computer-generated environment in a naturalistic fashion” (Schultheis & Rizzo, 2001)



<https://arvr.google.com/earth/>



Current Study

Background:

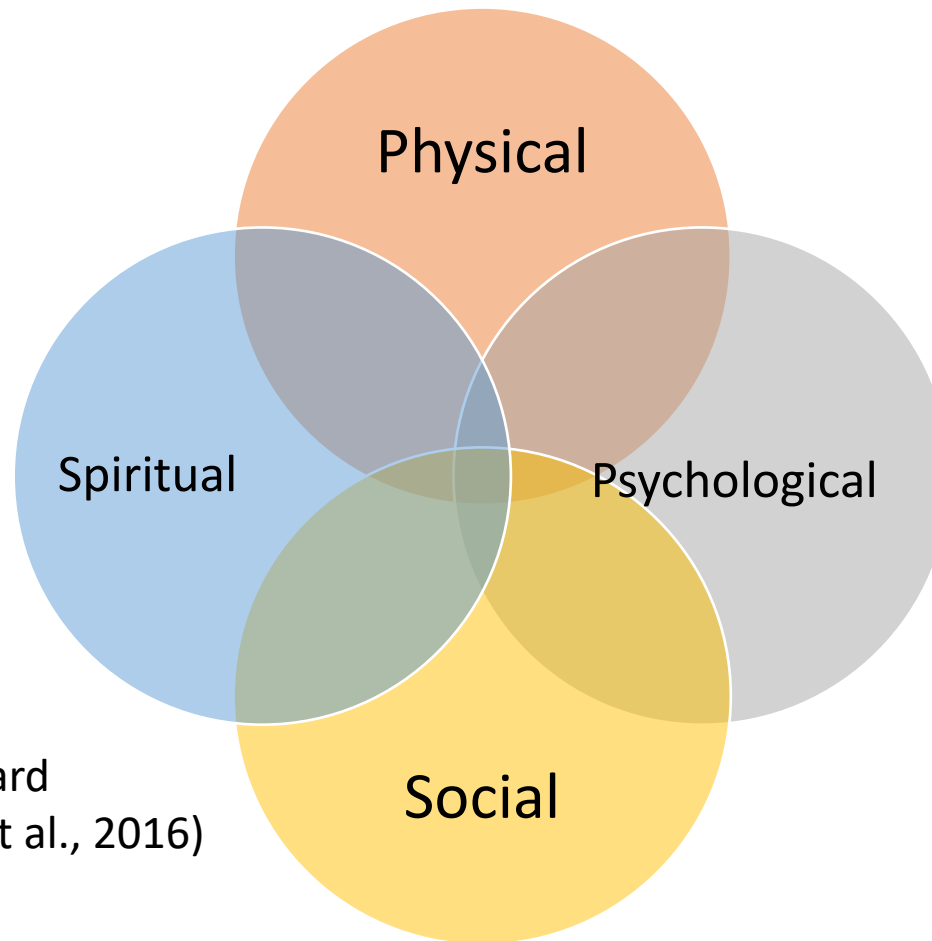
Unmet Needs under Biopsychosocial-Spiritual Model (Sulmasy, 2002)

Unmet physical needs

- Unresolved pain (Wu et al., 2020)
- Unresolved physical symptoms, e.g., shortness of breath, fatigue (Wang et al., 2018)

Unmet spiritual needs

- Limited spiritual practice in ward
- Spiritual pain (Delgado-guay et al., 2016)



Unmet psychological needs

- Limited problem-focused coping
- “not being able to do the things you used to do” (Wang et al., 2018)
- “I can do less than before” (Wang et al., 2018)
- “experiencing loss of control over one’s life” (Wang et al., 2018)
- Unfulfilled wishes (Niki et al., 2024)

Unmet social needs

- Inadequate family and friends’ support (Wang et al., 2018)
- Inadequate support in coping (Wang et al., 2018)

Virtual reality

- VR technology seems to be a way out, with research showing its *advantages* over conventional interventions for mental disorders (Freeman et al., 2016; Freeman et al., 2018; Riva, 2005)
- Recent systematic reviews consistently demonstrates its potential in symptom management *in palliative care* (Carmont & McIlfatrick, 2022; Moloney et al., 2023; Moutogiannis et al., 2023; Martin et al., 2022; Mo et al., 2022; Vasudevan et al., 2023).

Knowledge and Research Gap

- Existing studies are mostly *feasibility* and *pilot* study, without comparison arm with traditional interventions (Carmont & McIlfatrick, 2022; Martin et al., 2022; Mo et al., 2022; Moloney et al., 2023)
- Potential psychological *mechanisms* underlying the efficacy of VR interventions in palliative care

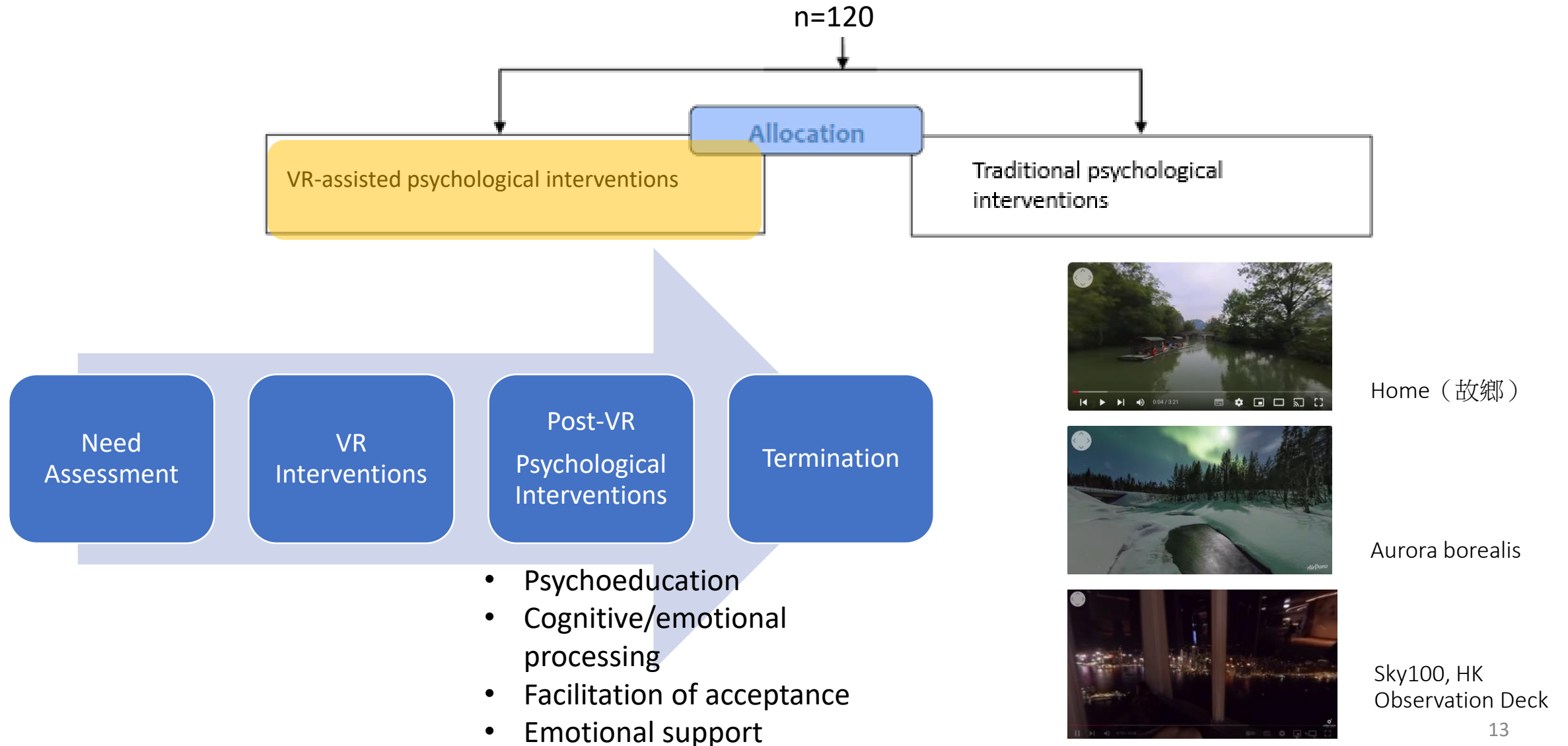
Research Objective

- To *develop* and *empirically test* a person-centered VR-assisted psychological intervention to reduce the palliative care symptoms

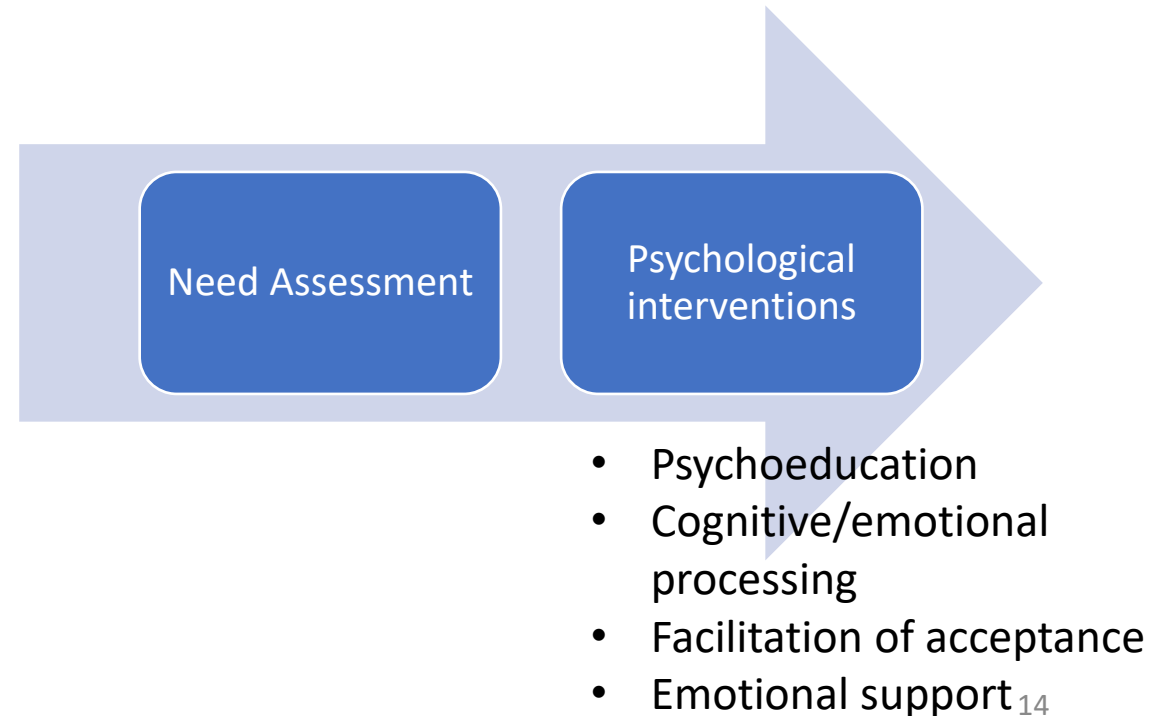
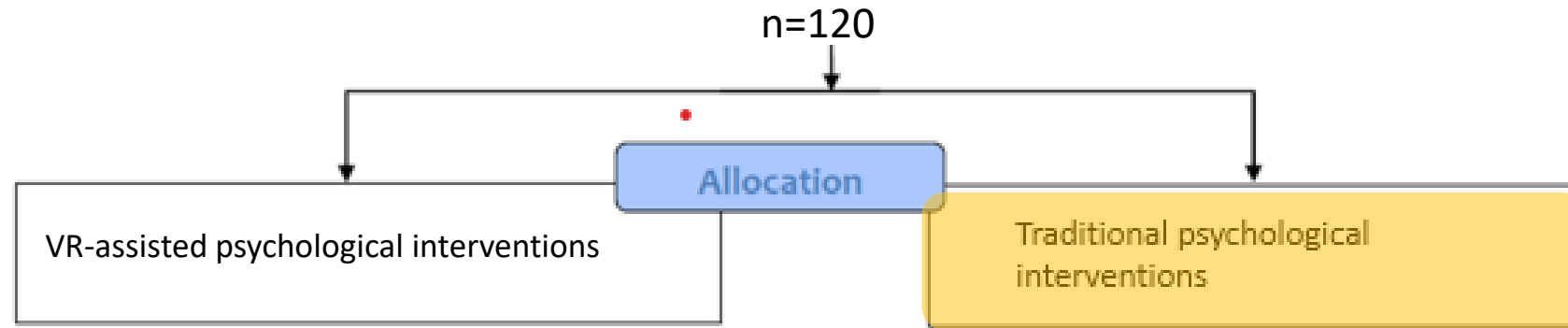
Hypothesis

1. *Our VR-assisted interventions* results in greater symptom reduction (improved emotional and physical symptoms) compared with treatment as usual
2. The sense of *flow* mediate the efficacy of symptoms

Research design and methods



Research design and methods



Research Design and Methods

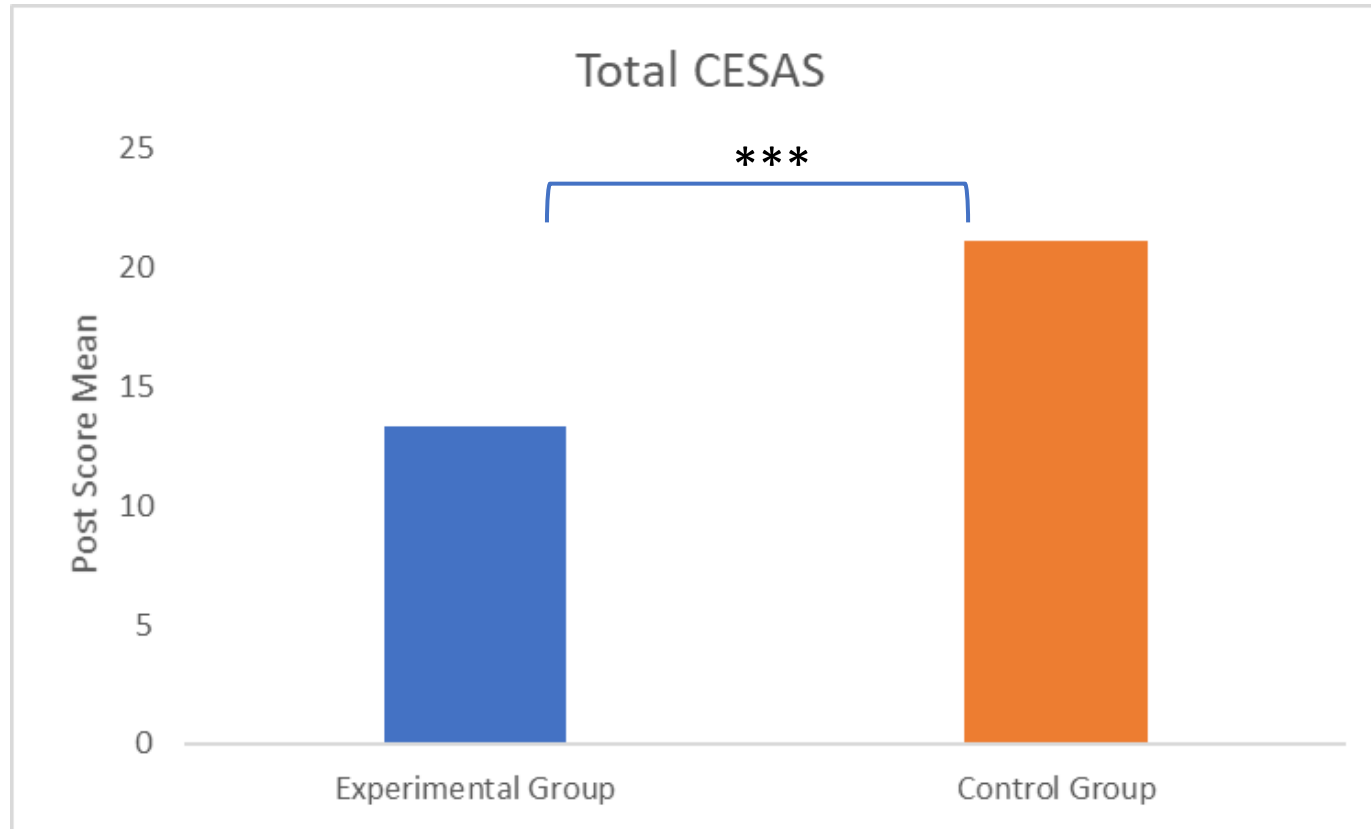
Outcome Measure

- Chinese Edmonton Symptom Assessment System (CESAS) (Bruera et al., 1991; Dong et al., 2015)
- Flow Short Scale (Engeser & Rheinberg, 2008; Rheinberg et al., 2003)

Statistical Analysis

- ANCOVA with the baseline assessment as covariate
- Mediation Analysis

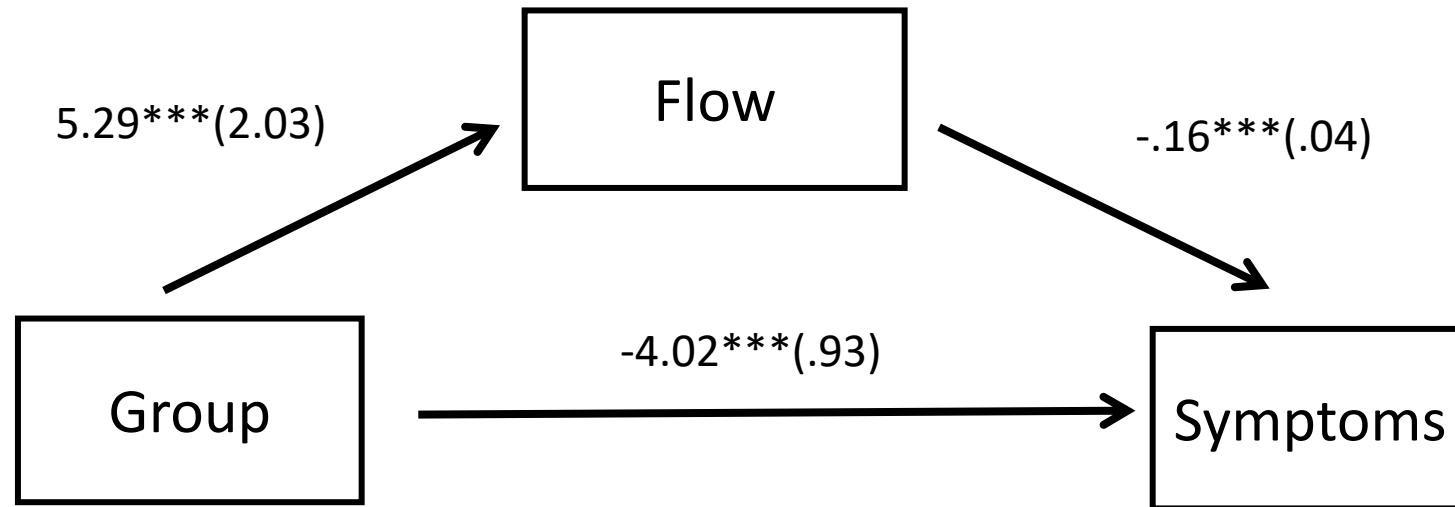
Results: Between-Group Analysis



ANCOVA Results

Results: Mediation analysis

- **Flow** mediated differences between the two groups
 - Total effect: $\beta = -.21, t = -4.97, p < .001$
 - Direct effect: $\beta = -.17, t = -4.02, p < .001$
 - Indirect effects: $\beta = -0.04, t = -.86, p = .03$



Discussion: Possible therapeutic benefits

- **Person-centered approach**

- *Self-determination Theory*: Choice in content fosters a sense of agency and autonomy (Wang et al., 2018)

- **Flow component**

- *Flow Theory* (Csikszentmihalyi, 1975): The flow experience induced potentially leads to more symptom control

- **Amplifying psychological interventions:**

- VR experiences *enhance* immediate psychological interventions
- Supports Kolb's (1984) *experiential learning model* by emphasizing the role of experience in learning.

Significance, Implications, and Future Directions

- **Evidence-based**

- VR-assisted interventions grounded in *theoretical* and *clinical* frameworks

- **Unique Features**

- Key features include *needs assessment*, *personalization*, and integration of *psychological intervention* with the VR experience.

- **Broader Implications**

- Application *in other populations*, such as pediatric patients, older adults and patients undergoing curative treatments.

Limitations of the Current Research

- **Reliance on Self-Report Questionnaires:**
 - primarily used *self-report* measures, suggest *objective* measures, e.g., biomarkers like heart rate, pulse rate, or galvanic skin response
- **Focus on Immediate Effects:**
 - only assessed *immediate* effects, leaving unclear whether therapeutic benefits are sustained over time.
- **Self-Selection Bias:**
 - Participants *self-selected* to join the study, potentially introducing *sampling bias* and resulting in a sample with generally adaptive coping strategies.



Case sharing 1

“I want to go Prague again because I had joyful memory with family there!”

- 47/F
- Cancer of rectum
- Palliative care status



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"I want to go Prague again because I have joyful memory with family there!"

Patient: This place seems really tall.

Psychologist: Does it? Do you feel scared?

Patient: Not really, but I can feel the centrifugal force!

Psychologist: Is it manageable for you?

Patient: Yes! ...Oh now I am in the ocean!

Psychologist: Let me know if you start to feel seasick.

Patient: This is amazing! If my son could see this, he would be even happier than I am.

Psychologist: Oh, does he enjoy this kind of thing?

Patient: Yes, he does!

Psychologist: We can hold the device for you if you start feeling tired.

Patient: I'm fine, thank you.

Psychologist: You can also look from side to side; there's more to discover. Try looking to your right.

Patient: This is fantastic! I've been here before! I even took a photo here once.

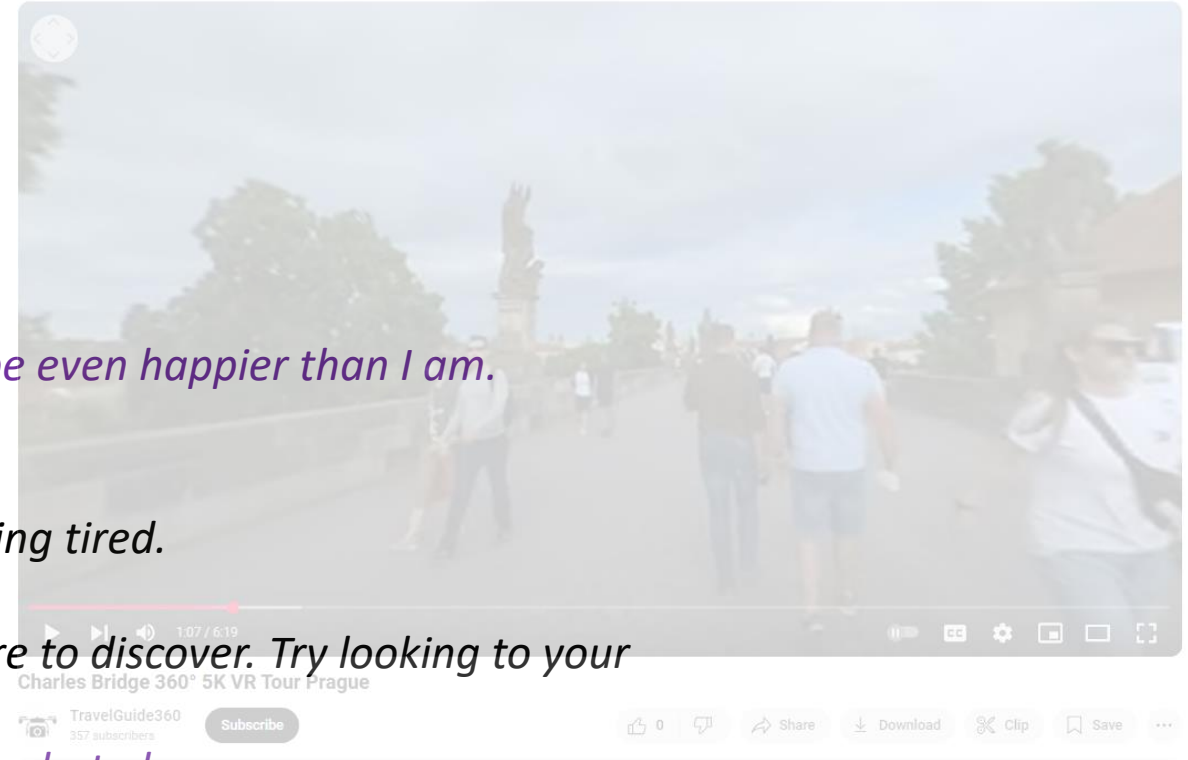
Patient: It feels really high up.

Psychologist: Was it less tall when you took the photo?

Patient: Yes, it was shorter back then.

Psychologist: When you took the photo, did you feel the same way you do now?

Patient: Similarly! It's exciting, even more so at night.





Case sharing 2

“I want to make him feel connected and at home in hospital”

Daughter of a 80yo patient



- 80 years old patient
- Sedated already upon referral. End-of-life stage
- Daughter requested to show family photos at ward. No projector/ equipment available at ward

虛擬實景(Virtual Reality) 錄影指引

步驟一：按此掣，等數秒，如聽到嘟一聲，看見紅燈在閃，便能開始錄影

步驟二：再按一下，便能停止錄影



小建議：

- 可把相機放在平面（如餐桌）上錄影
- 錄影內容例子：家人共享晚餐畫面，想跟病人說的心底話，病人喜歡前往的地方或只錄影家/房間片段也可
- 錄製內容將被保密。



Lady: *Get well soon! When you're back, you can teach us all those things you know so well—how to do this, how to do that. We'll be counting on your advice because you're so knowledgeable. Got it? Keep fighting!*

Cameraperson: *So wise and full of knowledge. (Clap)*

Gentleman: *I'm waiting for you to join me for "Lam Kee" milk tea. And don't forget the fresh butter pineapple bun—we'll share it, bite by bite.*

Lady: *We can't wait to celebrate and feast with you.*

Everyone: *Happy Mid-Autumn Festival!*

*“You matter because you are you, and you matter to the end of your life.
We will do all we can not only to help you die peacefully, but also to live until you die.”*

Cicely Saunders

Special Acknowledgement

Dr. Mike Wong

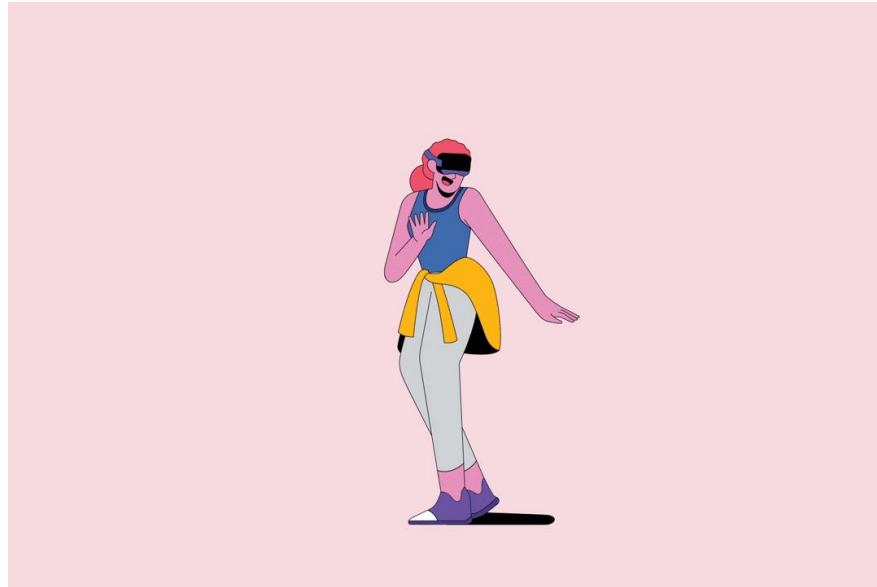
Dr. Jeffrey Liu

Dr. Alice Mok

NTEC PC team

&

you.



Thank you