Two is a Pair, Three is a Crowd
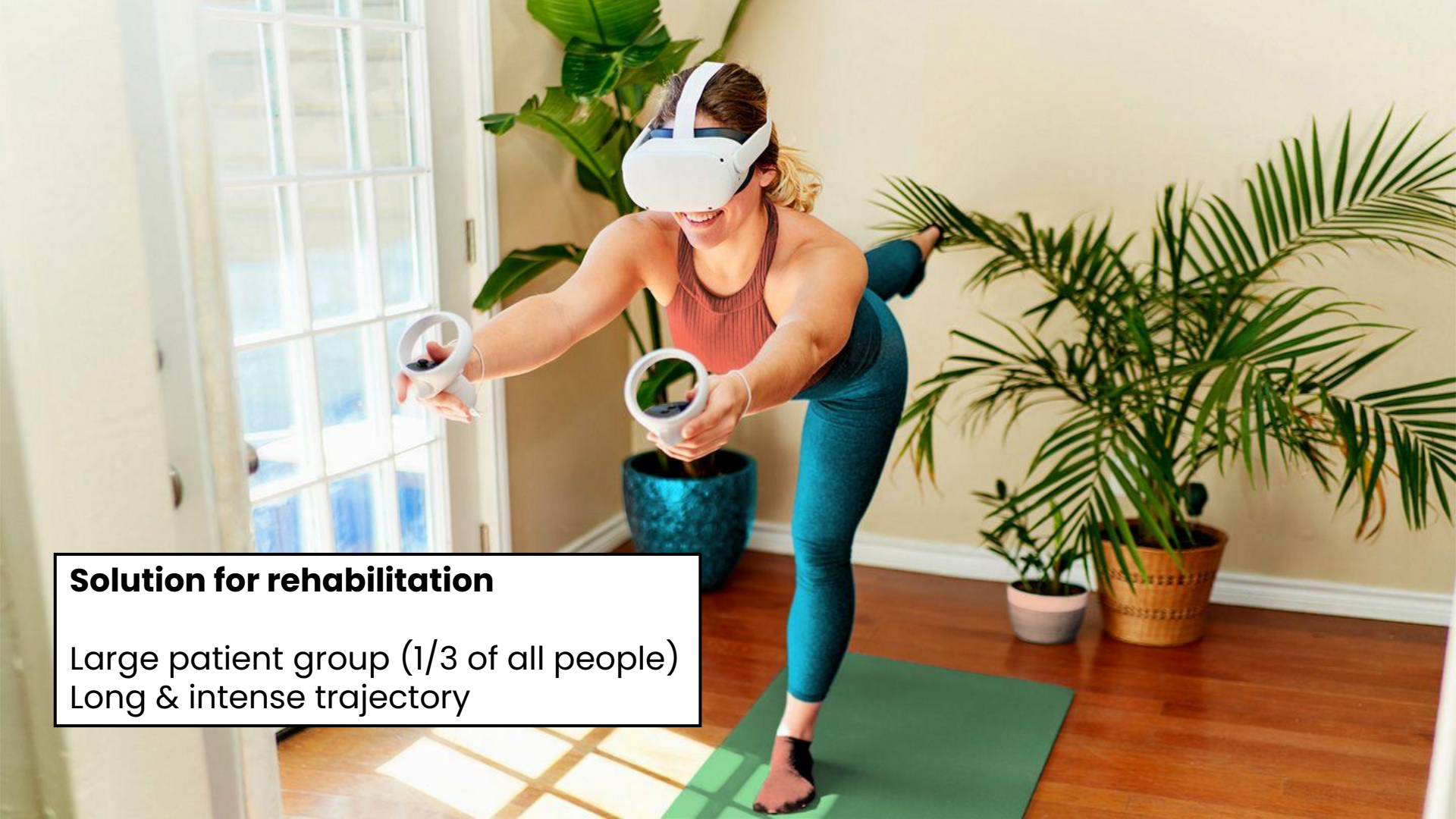
Reviewing The Three Sides Of XR-Telerehabilitation Adoption

L. Baltissen, W.A. Stienstra, L.D. Denoo & J. Knoben

Massive healthcare shortages:

- 10 mln by 2030 (Boniol et al., 2022)
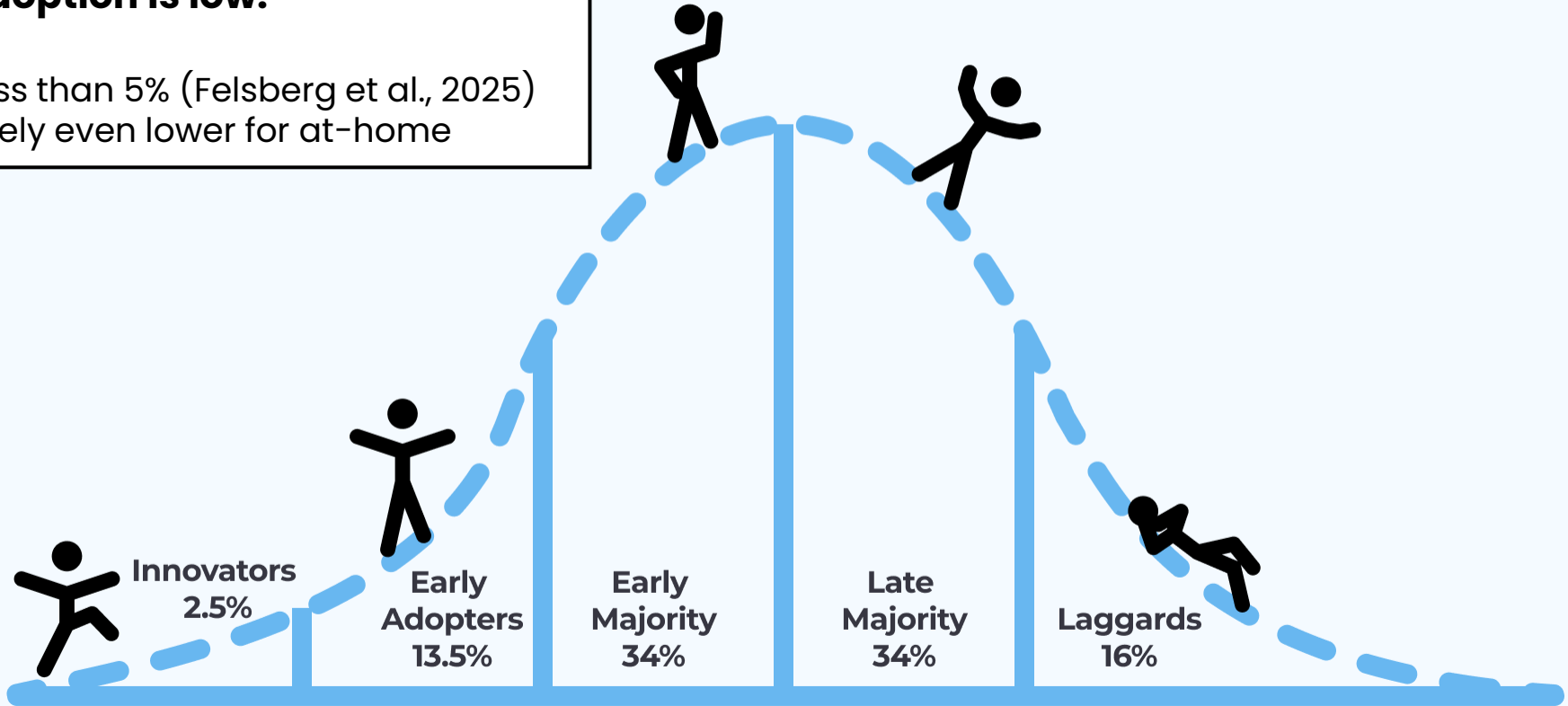- 13 mln by 2035 (WHO, 2013)

Solution for rehabilitation

Large patient group (1/3 of all people)
Long & intense trajectory

Product Adoption Curve

Custify

Adoption is low:

Less than 5% (Felsberg et al., 2025)
Likely even lower for at-home

Innovators
2.5%

Early
Adopters
13.5%

Early
Majority
34%

Late
Majority
34%

Laggards
16%

Three is pair, three is a crowd

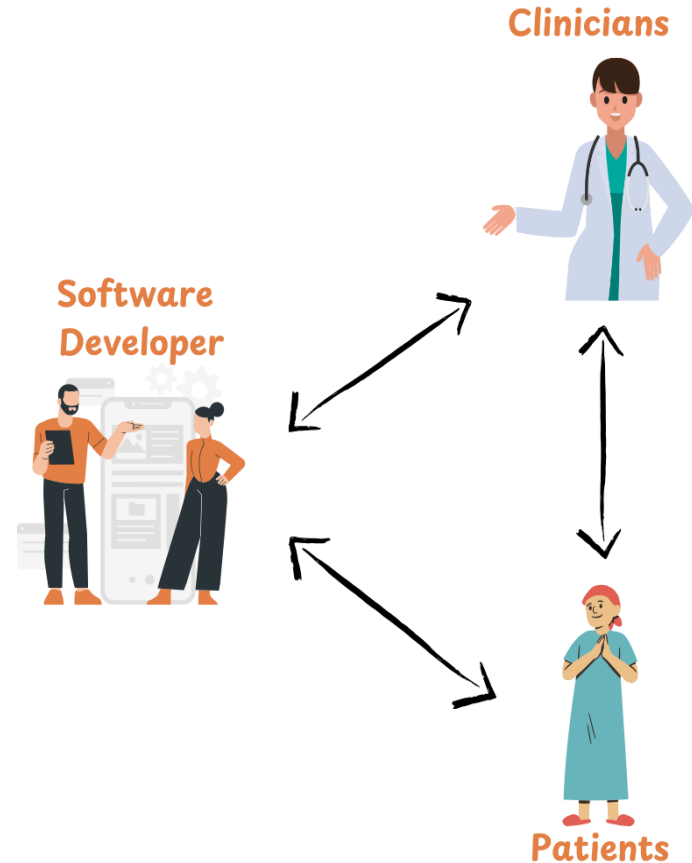Current literature outlines numerous reasons for low adoption

But:

- Does not consider conflicts between patients and clinicians
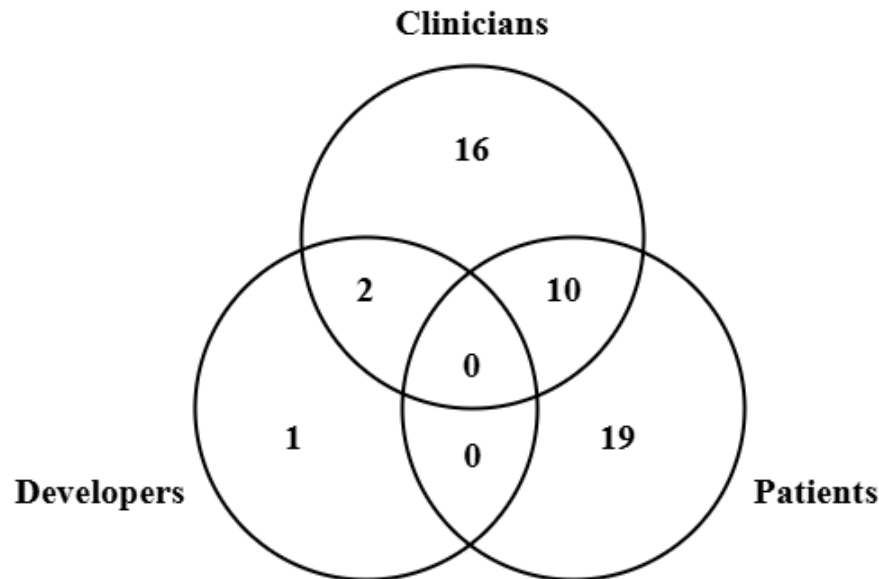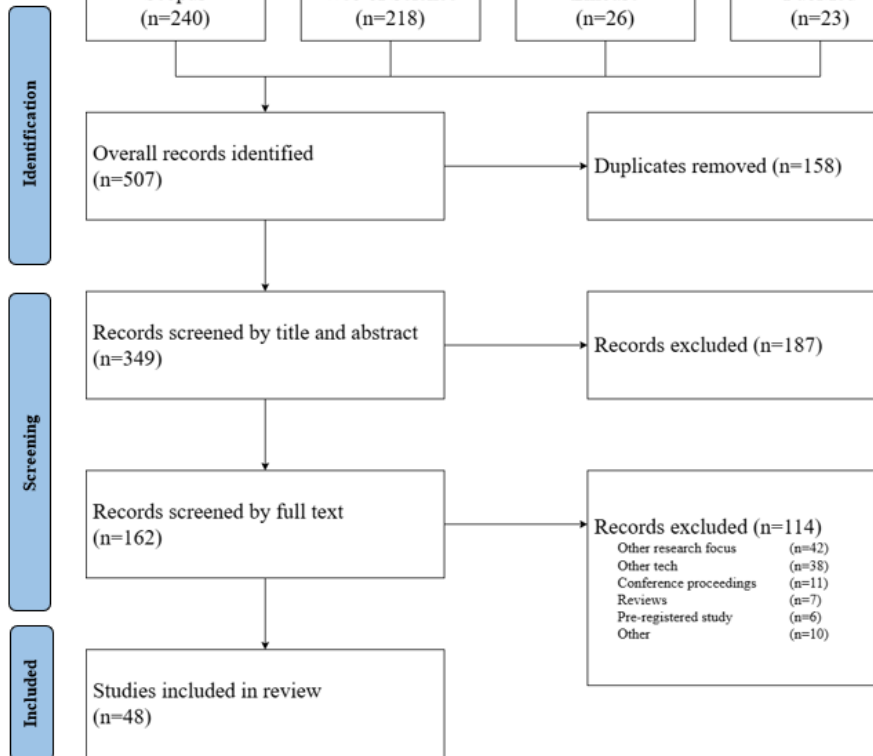
- Does not consider the fact that supply is needed

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How do the drivers of these actors conflict?

EHMA 2025

Clinicians

Software Developer

Patients

Three is pair, three is a crowd

Identification of studies via databases and registers

Scopus (n=240) — Web of Science (n=218) — Embase (n=26) — PubMed (n=23)

Overall records identified (n=507) → Duplicates removed (n=158)

Records screened by title and abstract (n=349) → Records excluded (n=187)

Records screened by full text (n=162) → Records excluded (n=114)
- Other research focus (n=42)
- Other tech (n=38)
- Conference proceedings (n=11)
- Reviews (n=7)
- Pre-registered study (n=6)
- Other (n=10)

Studies included in review (n=48)

Identification — Screening — Included

Clinicians 16

Developers 1

Patients 19

2, 10, 0, 0

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Approach:

1. Divided the papers by the actor

2. Divided findings across the seven NASSS domains (Greenhalgh et al., 2017)

3. Compared the findings per actor to determine conflicts
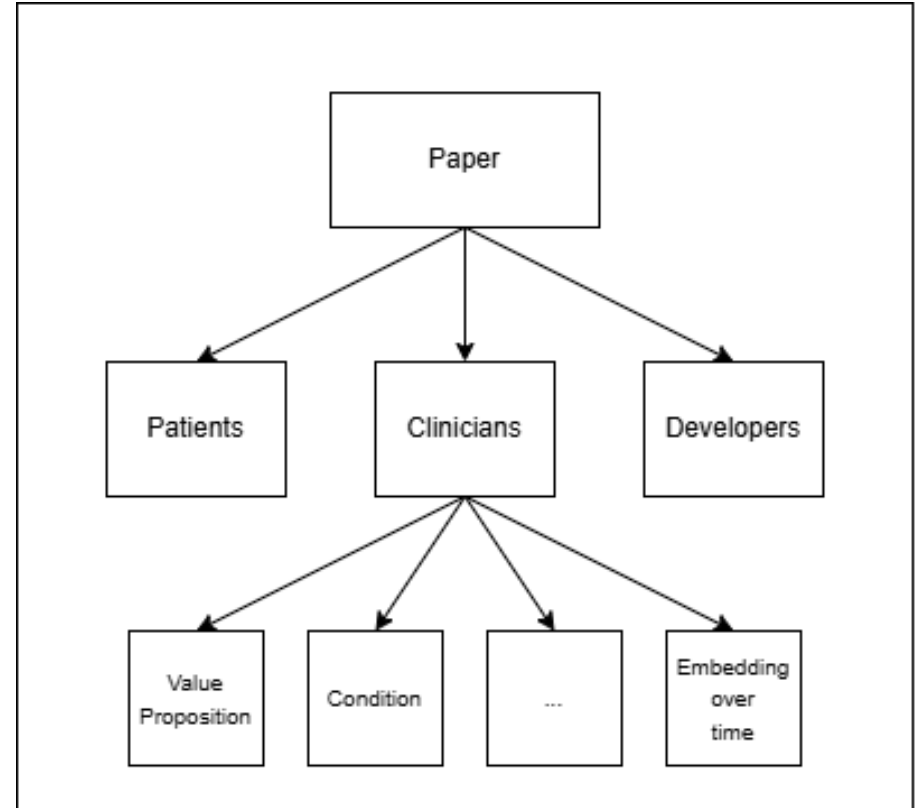
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1. Medical efficacy

   - Clinicians consider a wider set of factors

   - They have a higher need for medical evidence (13/28 vs. 1/29)

   - They prefer seated exercise over standing exercises

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2. Clinician's work experience

- Patients do not really value it

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3. Limited ability/willingness to pay hinders developers

- Developers face high development costs (Bradwell et al., 2023)

- Both patients and clinicians are limitedly able/willing to pay

- Clinicians also do not want the patient to pay

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<u>Theoretical contribution</u>

New 'multi-actor' perspective on adoption of XR tools:

1. New set of adoption barriers

2. Can be used by future scholars

   1. Investigate developers
   2. Validate the barriers we found
   3. Find new conflicts
   4. Find solutions to the conflicts

<u>Practical contribution</u>

Developers can align products with needs of *both* users

Government can create *better* regulations

Entrepreneurs can develop fitting solutions (e.g. platform or B2C)