Effectiveness Of Digital Care Platforms For Cancer Patients: A Systematic Review And Meta-analysis

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INTRODUCTION

- Cancer care has evolved with early detection, improved treatments, and an ageing population, **increasing the global cancer burden**[1,2].
- Healthcare systems must focus on **quality and sustainability**, with **eHealth** offering potential support[3].
- **Evaluating eHealth effectiveness** is crucial for sustainability, usability, and improving cancer care[4,5].
- **Digital care platforms** (DCPs) aim to enhance cancer care but their impact on quality of life (QoL), symptoms, self-efficacy, treatment adherence, and cost-effectiveness remains unclear.
- **This systematic review and meta-analysis** assess the effectiveness of DCPs on these outcomes.
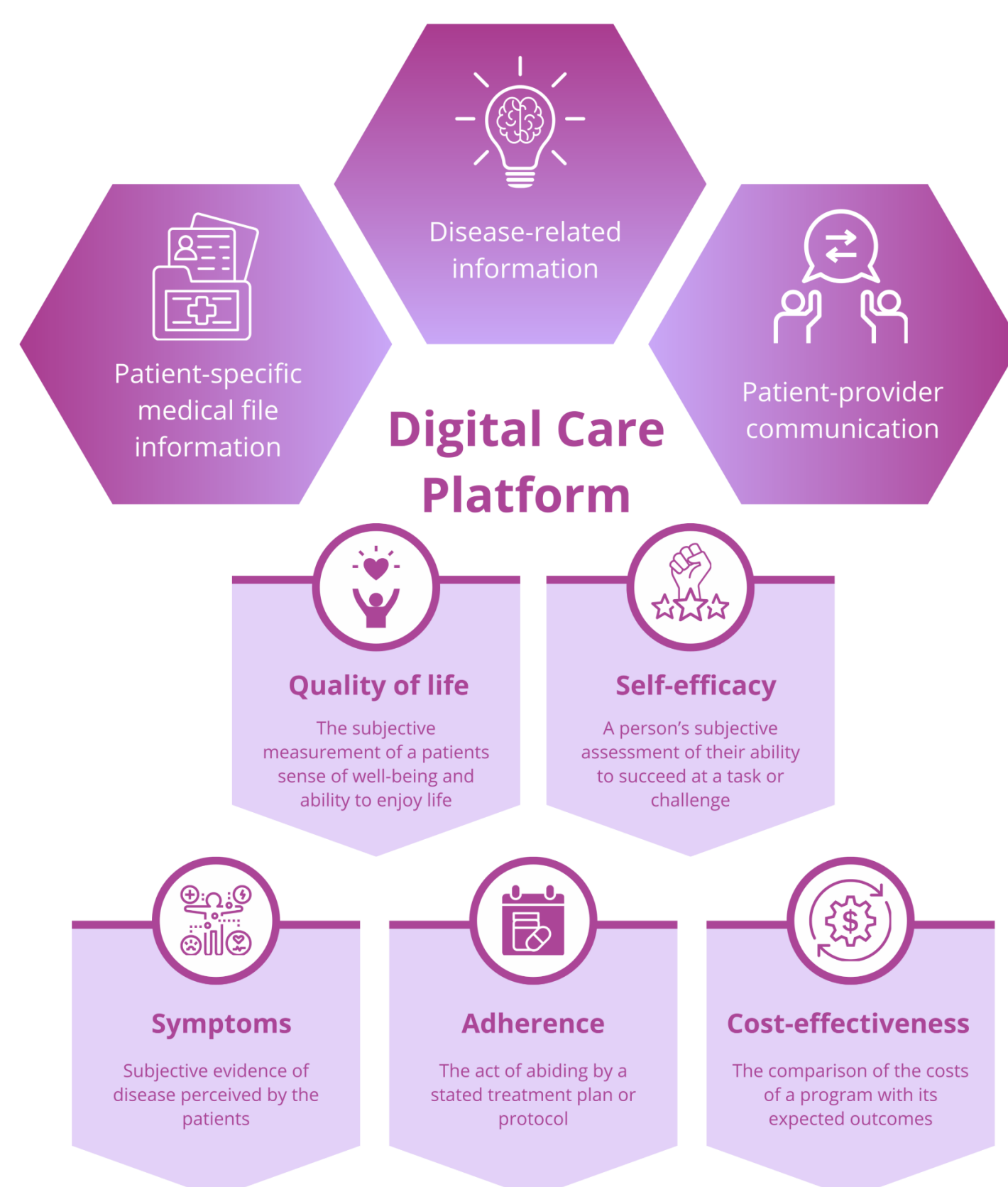

Figure 1. Overview of the features of a DCP and its effectiveness measures.

METHODS

- A **systematic search** was conducted in CINAHL, Cochrane Library, Embase, and PubMed[6].
- Studies published between **January 1, 2000, and May 1, 2024**, that met eligibility criteria were included.
- **Meta-analyses** were performed for outcomes with **at least five eligible studies**, while others were analyzed descriptively.
- Standardized mean difference (SMD) with 95% confidence intervals (CIs) was calculated for pooled outcomes.
- **Heterogeneity** was assessed using the I^2 statistic, and a **random effects model** was applied to account for it.
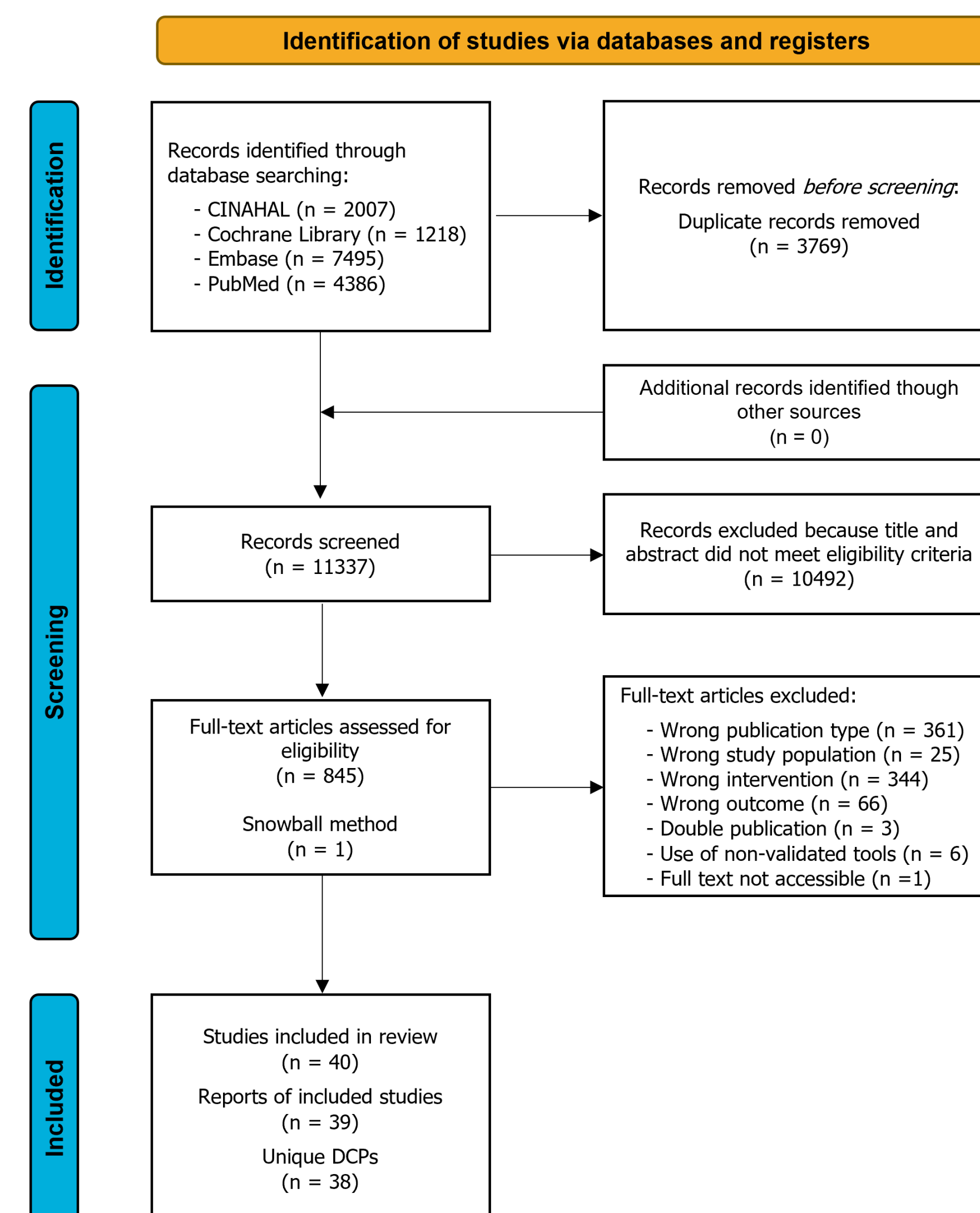
RESULTS

Figure 2. PRISMA flow diagram of the articles.

- **39 studies** (5,681 participants, 36 DCPs) were analyzed.
- **82%** had a **high risk of bias** in outcome measurement.
- Lack of blinding led to:
  - 36% with concerns about intervention deviations.
  - 23% at high risk of such deviations.
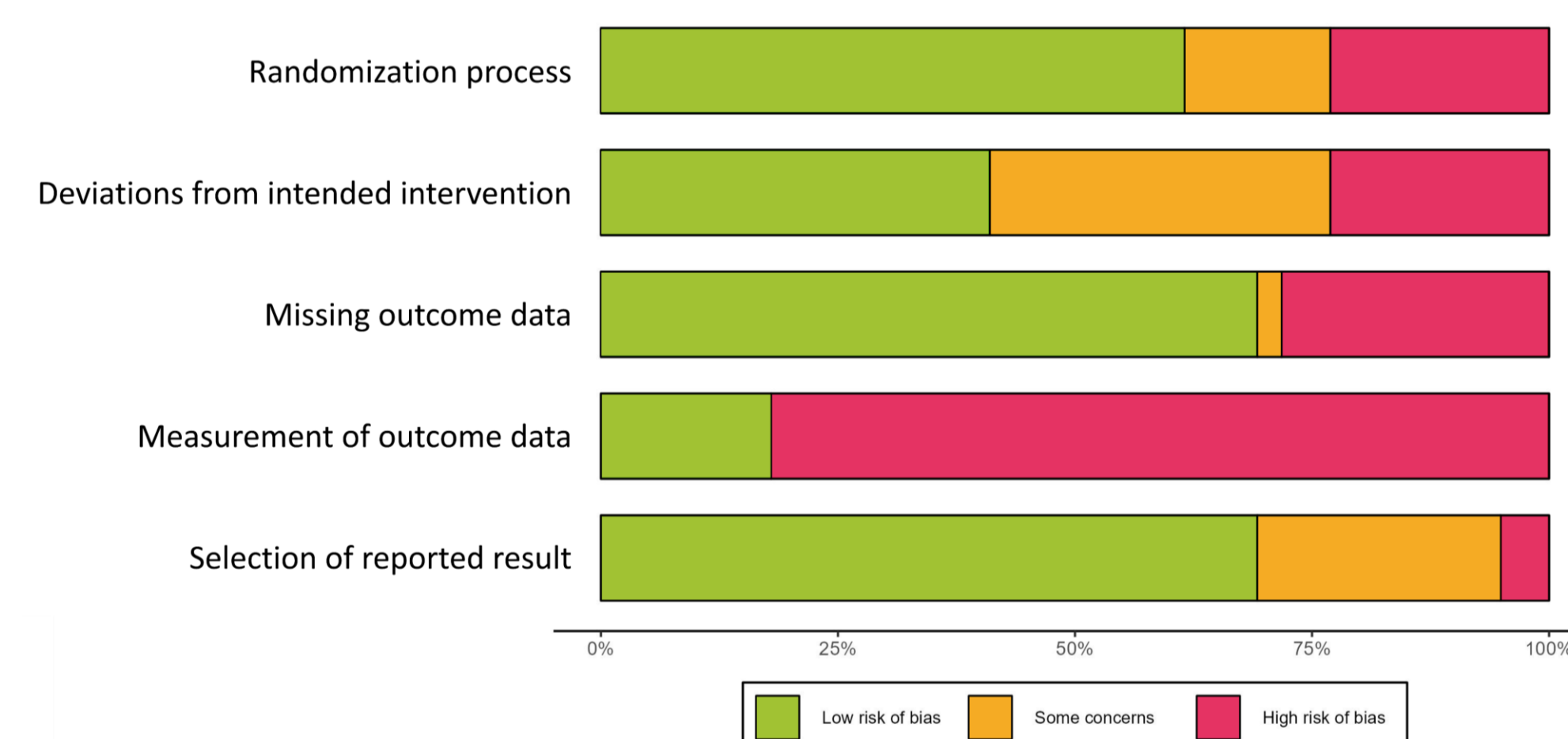- Six studies used a single-blind design to reduce bias.

Figure 3 Distribution of risk-of-bias judgements within each bias domain.

- Meta-analysis was conducted for **three of six** outcomes:
  - **Improved quality of life** (SMD 0.39 [0.03; 0.75 CI])
  - **Increased self-efficacy** (SMD 0.20 [-0.08; 0.48 CI])
  - **Reduced symptoms** (SMD -1.02 [-2.12; 0.07 CI])
- Descriptive results suggest fewer symptoms, higher self-efficacy, better adherence, and greater cost-effectiveness with DCPs.
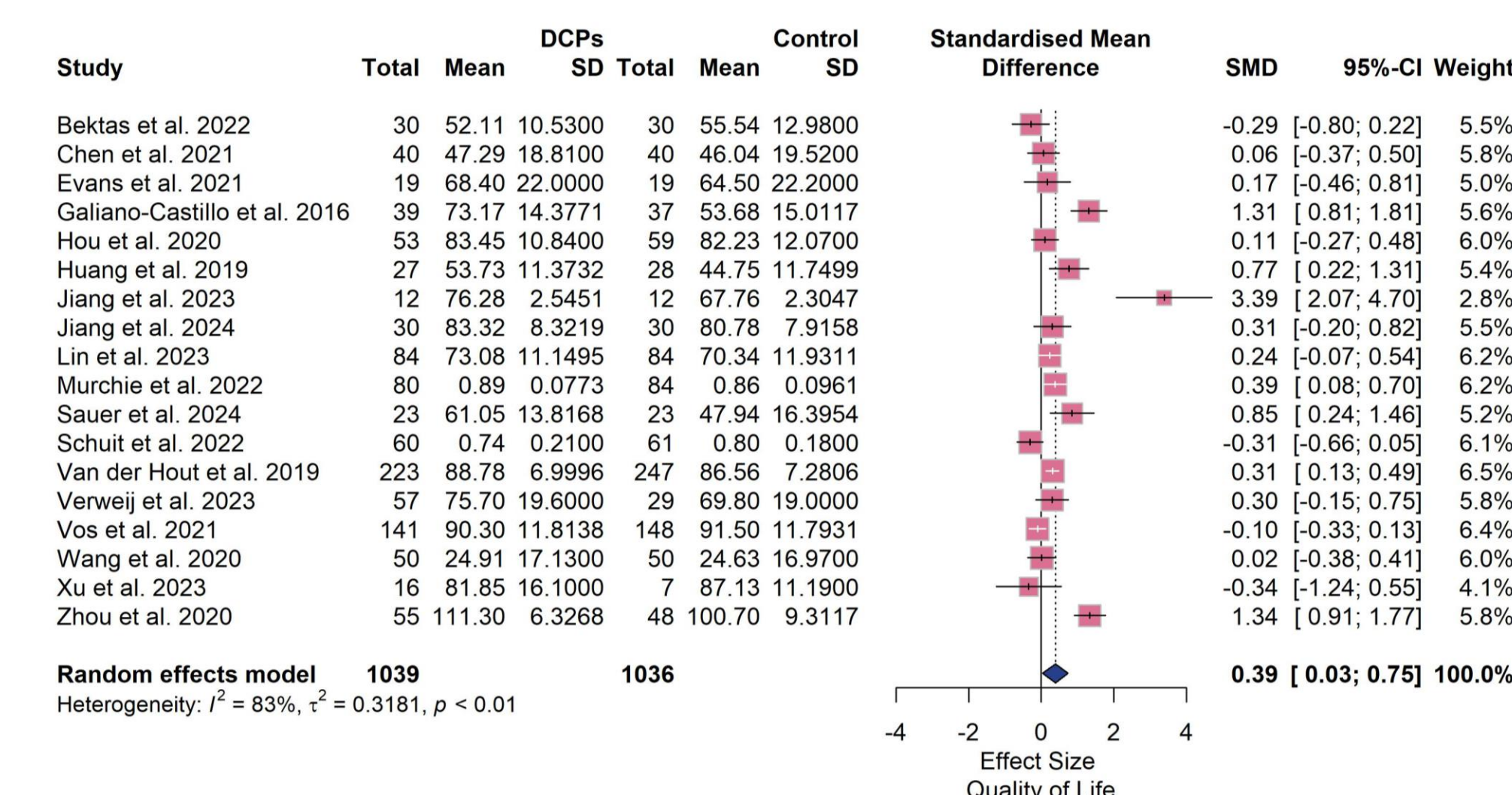- Descriptive findings on QoL remain inconsistent.

Figure 4. Meta-analysis of QoL using nested means when multiple follow-up measurements were reported.
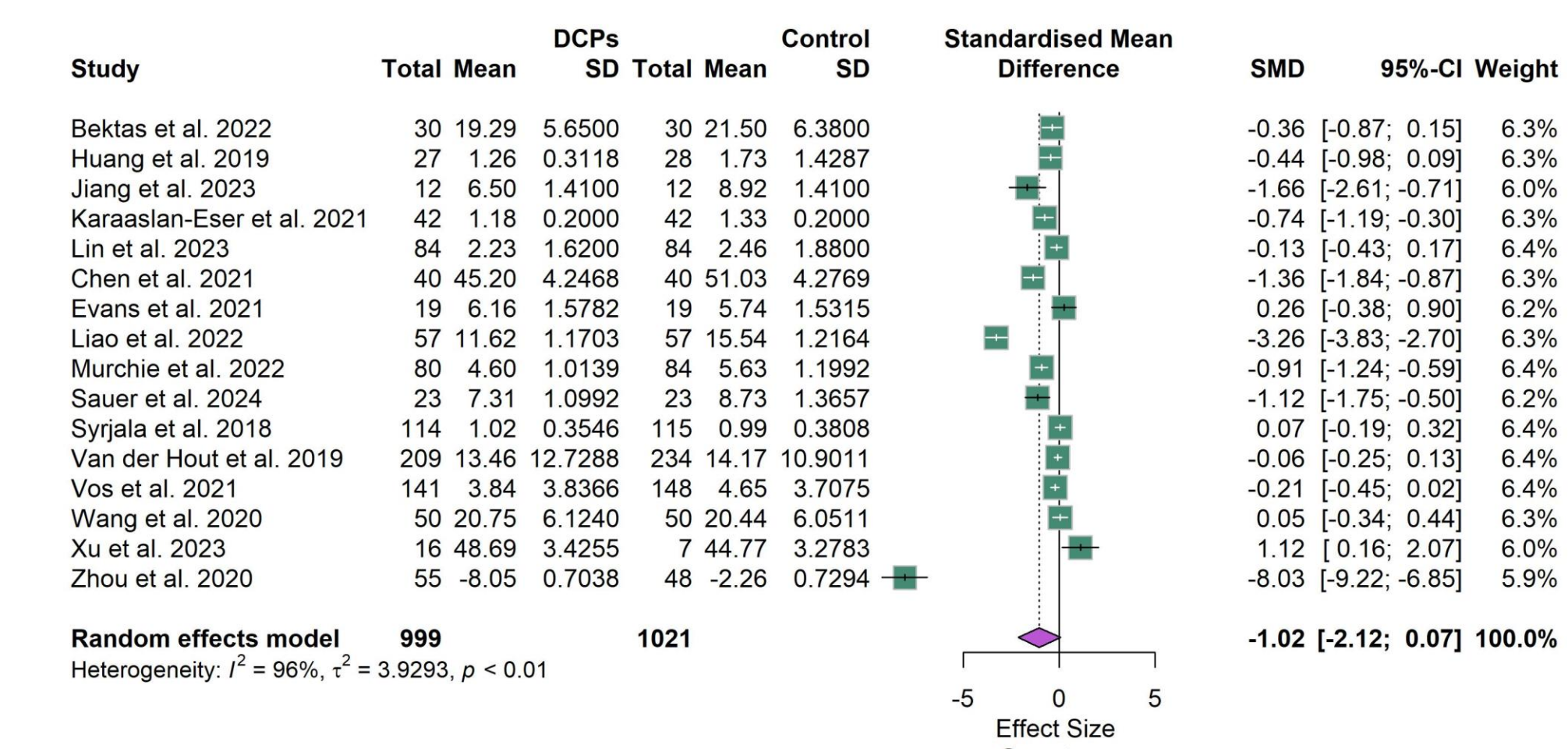

Figure 5. Meta-analysis of symptoms using nested means when multiple follow-up measurements and multiple symptoms were reported.
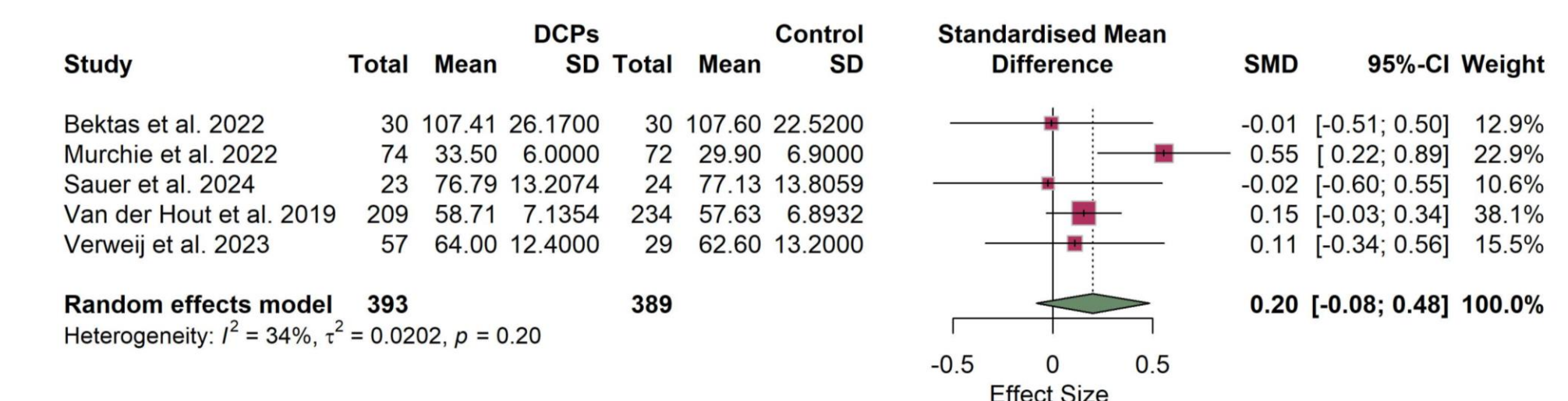

Figure 6. Meta-analysis of self-efficacy using nested means when multiple follow-up measurements were reported.

DISCUSSION

- **DCPs can enhance cancer care** by improving quality of life, self-efficacy, and symptom management while offering a cost-effective approach.
- They support **sustainable healthcare** systems in managing the growing global cancer burden[7,8].
- Challenges remain in comparing digital vs. standard care due to:
  - **High risk of bias** from self-reported data.
  - **Inability to blind** participants or investigators.
- Future research should develop better comparison methods and standardized tools for evaluating eHealth[9].
- Despite limitations, **findings underscore DCP effectiveness** and the need for further study.

TAKE AWAYS/ IMPLICATIONS

DCPs Improve Cancer Care: Digital care platforms can enhance quality of life, reduce symptoms, increase self-efficacy, and improve adherence, potentially making cancer care more efficient and cost-effective.

Broad Applicability Across Cancer Types: The findings apply to diverse cancer patients, including both active patients and survivors, offering insights for improving care broadly.
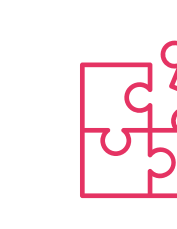
Standardized DCP Definition Needed: A unified definition of DCPs would improve consistency in evaluating their effectiveness and impact on patient care.
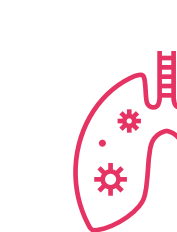
Evidence-Based DCPs Are Essential: For DCPs to be effective in cancer care, they must be rigorously evaluated and evidence-based to ensure they deliver real improvements in patient outcomes and long-term disease management.

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