

MDCMA / BCMA RESEARCH COMPETITION

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Health Journeys: Engagement-Linked Mental Health Outcomes in a Real-World Digital Medicine Program

A retrospective analysis of digital health engagement and mental health outcomes in a real-world clinical cohort.



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Clinical Context

Global Burden

Depression and anxiety: leading global disability causes.

Functional Impact

Impairs work, social function, and quality of life.

Scalability Need

Scalable activation crucial for behavioral health demand.



The Implementation Gap



Tools Are Deployed

Digital health platforms are widely deployed.



Engagement Is Tracked

Usage tracked, but clinical outcomes often unclear.



Outcomes Are Unclear

Does engagement truly translate into measurable symptom improvement?

Research Question

Does engagement with digital health resources translate into measurable, mental health symptom improvement (e.g. depression, anxiety, and negative affectivity)?

Health Journeys Framework

Health Journeys are digital modules that empower patients with knowledge for self-management, integrated into routine assessments.



Mental Health

Modules for depression, anxiety, stress, emotional resilience.



Lifestyle & Wellness

Education on nutrition, activity, sleep, holistic well-being.



Pain & Self-Management

Structured content for chronic pain coping and self-activation.

Study Objective

This study evaluates if Health Journeys digital resources improve **mental health and symptom outcomes** for patients on our digital platform.

Hypothesis: Engaged participants will show greater reductions in depression and anxiety.

Exposure

Module Engagement

Outcome

Symptom Score Improvement

Setting

Digital Health Platform



Study Design

1

Retrospective Cohort

Observational design using existing platform data.

2

Real-World Data

Data from routine platform usage logs.

3

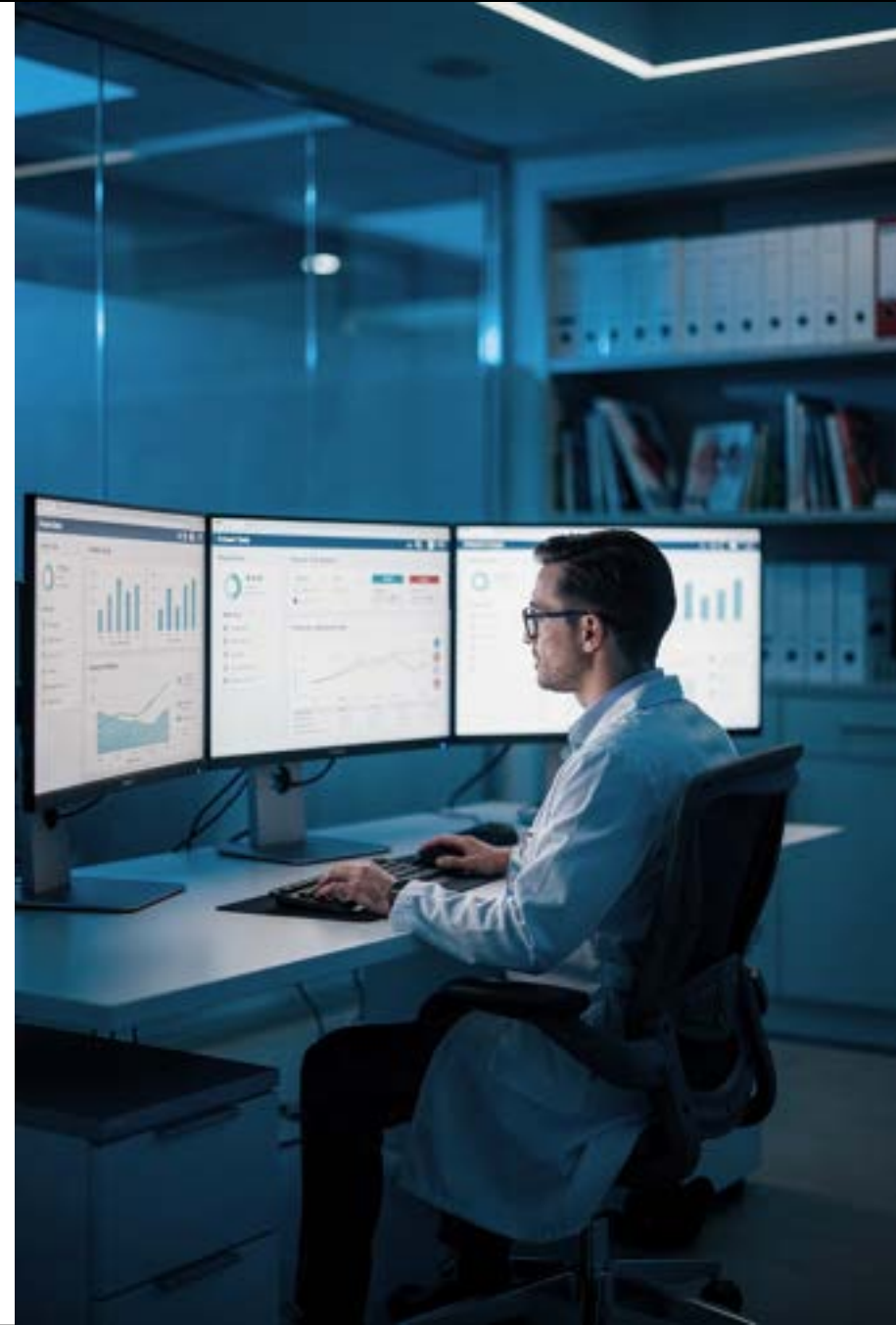
Inclusion Criteria

Requires 2 assessments (baseline & follow-up).

4

Complete Cases

Analyses used complete case data per outcome.



Ethical Considerations

Routinely Collected PHI

Secondary analysis used existing PHI from logs.

IRB Exemption Confirmed

Exempt from IRB review.

HIPAA & Human Subjects

HIPAA & human subjects protections adhered to.

No Direct Patient Contact

No direct patient contact or intervention.

ClinicalTrials.gov registration associated with related digital medicine protocol: NCT06603935



Participants

4,228

Total Cohort

Analytic sample with ≥2 assessments



4,228 Total Cohort

Analytic sample with ≥2 assessments

666

Engaged

Accessed ≥1 Health Journeys module



666 Engaged

Accessed ≥1 Health Journeys module

3,562

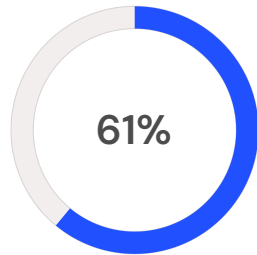
Non-Engaged

No recorded resource access

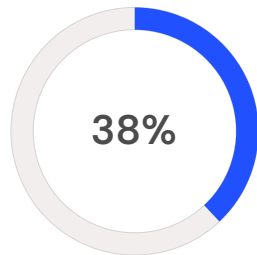


3,562 Non-Engaged

No recorded resource access



Women



Men

□ **Mean age:** 47.83 years (range 7–99 years), reflecting a broad, real-world demographic distribution across the lifespan.

Engagement Definition

Engagement status was objectively determined from platform data, avoiding self-reported biases.

Engaged

Accessed ≥ 1 Health Journeys module.

Non-Engaged

No recorded access to any resources.

📄 Behavioral metrics offer more reliable classification than self-reported data.

Outcome Measures

Change was defined as $\Delta = \text{Follow-up} - \text{Baseline}$. For PHQ-9, GAD-7, and Q-NEG, a more negative Δ indicates clinical improvement (symptom reduction).



PHQ-9

Depression severity — 9-item validated screener widely used in primary care and behavioral health



GAD-7

Anxiety severity — 7-item generalized anxiety disorder scale with established psychometric properties



Q-NEG

Composite negative health indicator index — aggregated measure of overall symptom burden

Statistical Approach

01

Calculate Δ per participant

02

Compare group means via Welch's t-test

03

Report 95% CIs, two-sided p-values

Key Parameters

Test: Welch's independent samples t-test

Confidence: 95% confidence intervals

Significance: Two-sided $\alpha = 0.05$

Rationale: Robust to unequal groups and variance

Primary Results

Health Journeys significantly improved depression (PHQ-9) and negative health burden (Q-NEG); anxiety did not.



PHQ-9

p = 0.006

Significant improvement in depression.



Q-NEG

p = 0.021

Significant improvement in negative health burden.



GAD-7

p = 0.775

No significant difference in anxiety.

Numeric Summary

Engaged participants showed greater symptom reduction for PHQ-9 and Q-NEG.

Measure	Engaged (Δ)	Non-Engaged (Δ)	Difference	p-value
PHQ-9	-0.260	-0.094	-0.166	0.006
Q-NEG	-1.176	-0.650	-0.526	0.021
GAD-7	—	—	—	0.775

□ The engaged group showed **76% greater PHQ-9 reduction** and **81% greater Q-NEG reduction**.

Interpretation

- Engagement improved Depression (PHQ-9)
- Engagement improved Negative Affectivity (Q-NEG)
- No significant improvement for Anxiety (GAD-7)
- Effects appear domain-specific



Limitations & Conclusion

Limitations

- Observational Design
- Non-Randomized Health Journeys delivery to patients
- Potential Confounding Factors
- Multiple Comparisons, No Adjustment

Conclusion

- Patients reported Improved depression (PHQ-9) and negative affect (Q-NEG).
- Supports scalable digital education tools.
- May help extends behavioral health care reach.