

Development and Evaluation of a Web-Based Lifestyle Intervention for Depression in Young Adults: A Randomized Controlled Trial

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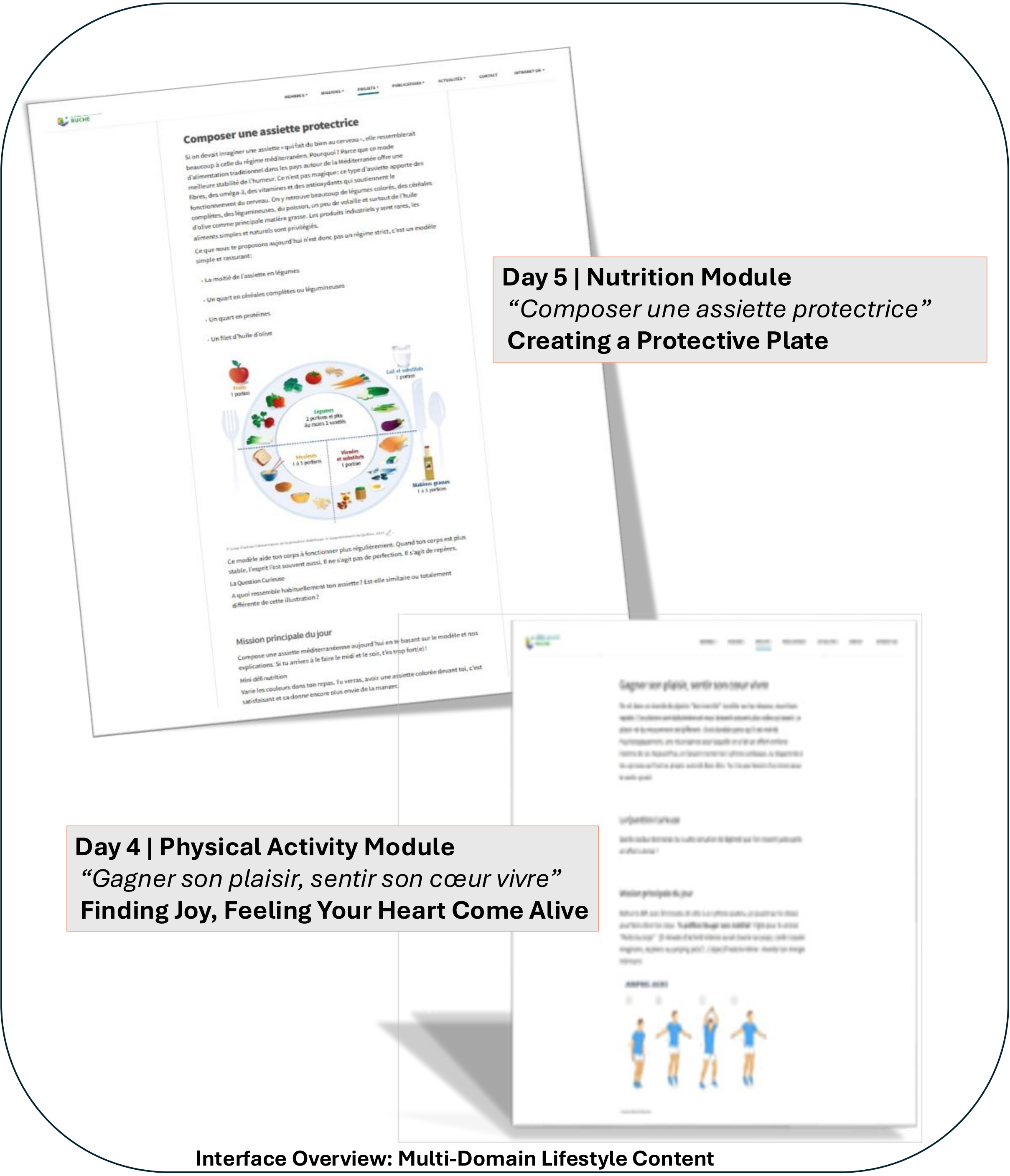
INTRODUCTION

- **Depression is highly prevalent among young adults** and is closely associated with modifiable lifestyle behaviors.
- Our preliminary findings identified **poor sleep quality, unhealthy dietary habits, sedentary behavior, and lower mindfulness and psychological resilience** as significant risk factors for depression.¹
- These findings highlight the need to move beyond risk-factor identification toward **accessible and scalable interventions** targeting lifestyle behaviors.
- We therefore developed a **web-based intervention** designed to support sustainable lifestyle changes as a proactive strategy for reducing depressive symptoms in young adults.

Objective:

To evaluate the efficacy of a dedicated web platform in promoting lifestyle changes and reducing depressive symptoms among young adults.

RESULTS



Day 4 | Physical Activity Module
“Gagner son plaisir, sentir son cœur vivre”
Finding Joy, Feeling Your Heart Come Alive

Day 5 | Nutrition Module
“Composer une assiette protectrice”
Creating a Protective Plate

Interface Overview: Multi-Domain Lifestyle Content

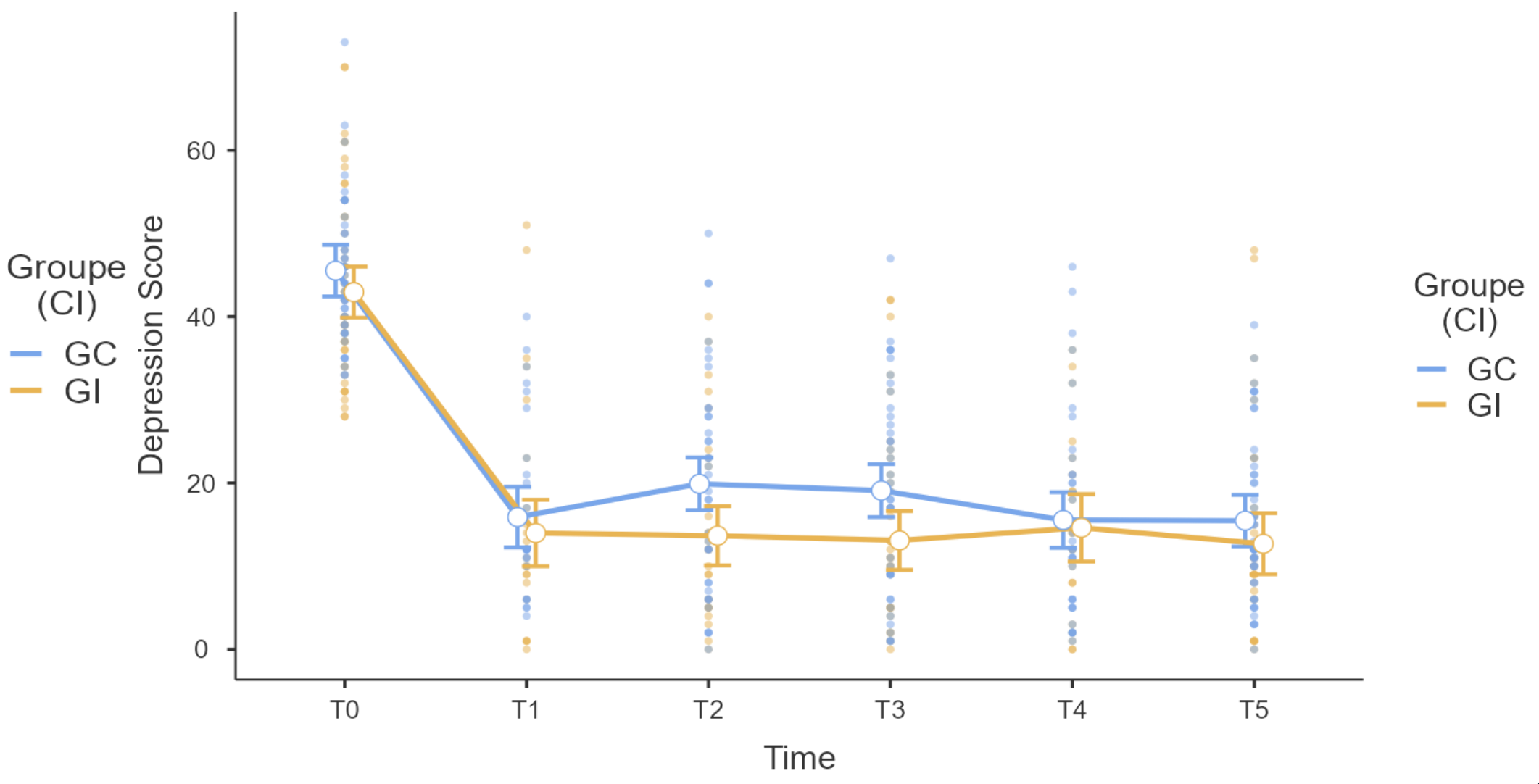
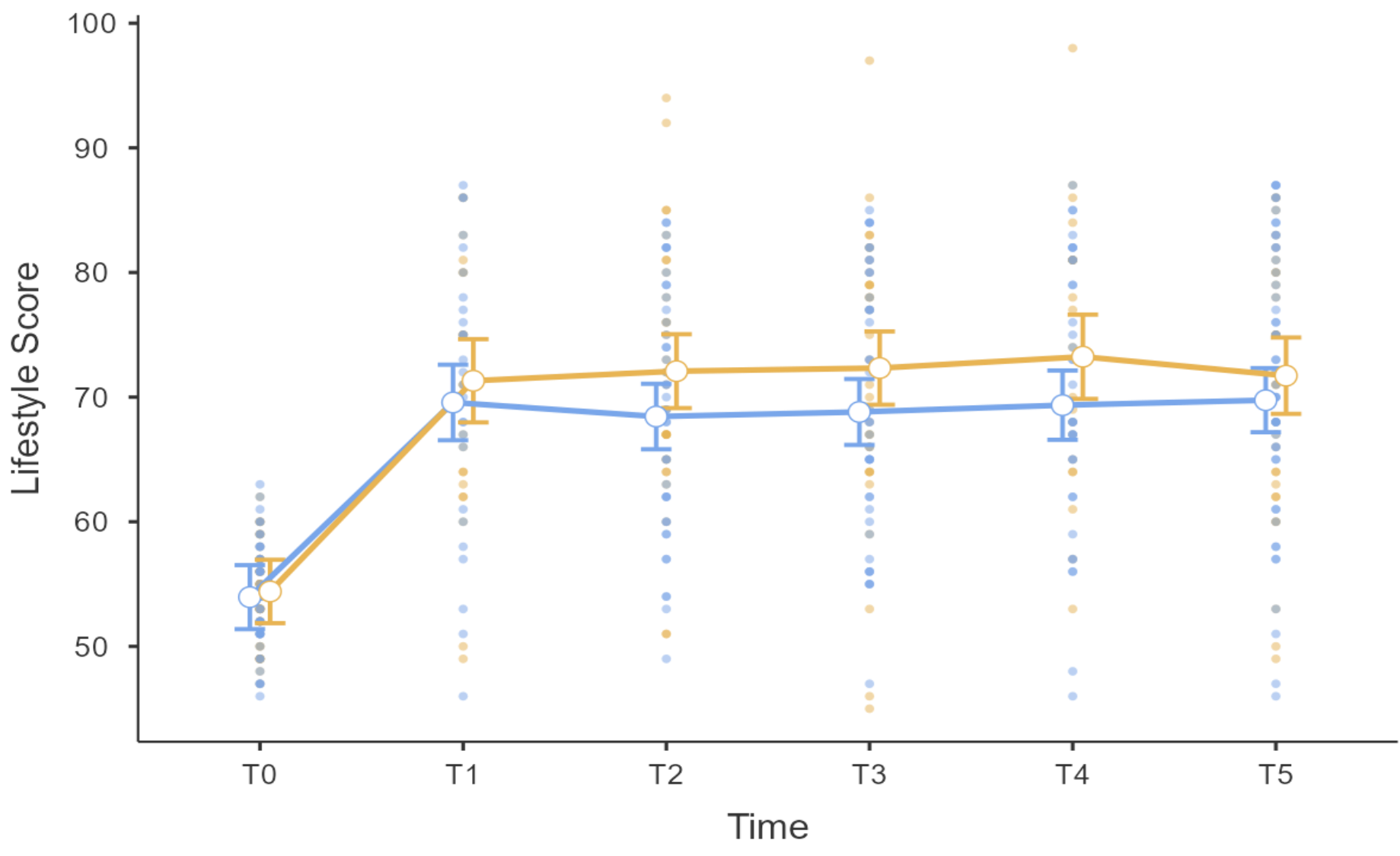
METHOD

- **Study design:** Randomized Controlled Trial comparing a **5-week modular web-based lifestyle intervention** with a waitlist control group.
- **Participants:** 125 young adults were randomly allocated to Intervention Group (GI, M age = 23.06) or Control Group (GC, M age = 24.32). 70.8% were women and 28.1% were men; most were university students.
- **Intervention:** A modular digital intervention targeting **nutrition, sleep, physical activity, mindfulness, and psychological resilience**, delivered through a cross-platform web platform (smartphone, tablet, and PC).
- **Assessment:** Depressive symptoms and lifestyle were assessed longitudinally at **six time points (T0–T5)**, including baseline and post-interventions.
- **Statistical analysis:** **Linear Mixed Models (LMMs)** were used to examine changes in depressive symptoms and lifestyle scores over time. Models included **group, time, and group × time interaction** as fixed effects, with a **random intercept for participant (ID)** to account for repeated measurements. The models were estimated using the **Satterthwaite method for degrees of freedom**.
- **Analytical sample:** The analyses included **411 observations from 125 participants**.

Key Findings

- **Significant Reduction in Depressive Symptoms:** A highly significant main effect of time was observed ($p < .001$), with mean depression scores dropping sharply from baseline (GC: 45.5, GI: 42.9) to post-intervention and follow-up assessments (ranging between 12.7 and 19.9).
- **Marked Improvement in Lifestyle Behaviors:** Overall lifestyle scores improved significantly over time ($p < .001$), increasing from baseline averages (approx 54.0) to sustained higher scores (approx 68.4 - 73.2) across T1–T5.
- **Group Comparisons:** While group-by-time interactions did not reach statistical significance ($p > .05$), main effects for group showed a trend toward significance ($p = .059$ for depression and $p = .087$ for lifestyle).

Outcome	Main Effect: Time	Main Effect: Group	Interaction: Group × Time
Depression Score	$F(5, 313) = 186.24, p < .001$	$F(1, 142) = 3.61, p = .059$	$F(5, 313) = 1.31, p = .259$
Lifestyle Score	$F(5, 318) = 85.53, p < .001$	$F(1, 146) = 2.97, p = .087$	$F(5, 318) = 0.80, p = .551$



DISCUSSION

1. Clinical Improvement & Sustained Gains

- Strong **main effect of Time** ($p < .001$): depressive symptoms decreased by ~30 points, alongside a ~16–17-point improvement in lifestyle scores, with gains maintained through T5.
- However, **Group × Time interactions were non-significant** for depression ($p = .259$) and lifestyle ($p = .551$), indicating no evidence of greater improvement in the intervention group.

2. Why Did the Control Group Improve?

The substantial control-group improvement suggests that **study participation itself may have been behaviorally active**:

- **Assessment reactivity:** Six repeated assessments (T0–T5) may have increased self-awareness, reflection, and self-regulation, functioning as a low-intensity “micro-intervention.”
- **Nonspecific trial effects:** Attention, accountability, expectancy, and engagement with the study may have benefited controls independently of intervention content.
- **External influences:** Concurrent lifestyle changes, academic-calendar effects, or access to health information/support may also have contributed.

3. Methodological Considerations

- **Attrition:** Differential dropout could alter observed longitudinal trajectories; this requires dedicated missing-data/sensitivity analyses.
- **Self-report bias:** Repeated symptom and lifestyle measures may be influenced by reporting or social-desirability effects.
- The control condition may therefore have been **less inert than intended**, reducing the ability to detect an intervention-specific effect.

4. Implications for Future Trials

- Use **active control conditions** matched for assessment and self-monitoring burden.
- Combine self-report with **objective digital measures** (e.g., actigraphy, sleep, physical activity).
- Perform **attrition/missing-data sensitivity analyses** to test robustness of longitudinal effects.
- Monitor **contamination and external interventions** to better isolate platform-specific effects.

TAKE-HOME MESSAGE

The platform was associated with large and sustained improvements, but the parallel response in controls highlights the influence of self-monitoring and study participation. Active-controlled trials are needed to isolate the platform’s specific therapeutic contribution.

