Master’s Thesis Presentation

Ruisi Liu
Department of Statistics
The University of Chicago

“A Mixed-Effects Analysis of Behavioral Change in the MBC2 Trial”

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Abstract

This study investigates the effectiveness of various behavioral interventions aimed at improving multiple health risk behaviors, including low fruit and vegetable intake (FV), high saturated fat intake (FAT), low moderate-vigorous physical activity (MVPA), and high sedentary leisure screen time (SED). The study is based on data from the Make Better Choices 2 (MBC2) clinical trial, which involved 212 adults receiving interventions through mHealth technology, modest incentives, and remote-connected coaching under both simultaneous and sequential treatment conditions.

Using mixed-effects location scale models, we analyzed within-person variability and assessed the impact of the interventions over time. The results demonstrate that both intervention strategies significantly increased the mean levels of healthy behaviors and decreased the levels of unhealthy behaviors. Notably, diet and physical activity were more consistent across time during the intervention period. The sequential treatment group exhibited greater consistency and homogeneity in certain behavior changes over time compared to the simultaneous treatment group. This suggests that a gradual introduction of physical activity alongside dietary changes may lead to more stable and sustained improvements.

The findings provide valuable insights into the dynamic processes underlying behavior change and highlight the potential for tailored interventions to sustain long-term health benefits. This research underscores the importance of understanding both the level and consistency of behavior changes to design more effective and resource-efficient health interventions. Future studies should focus on addressing the limitations encountered and further exploring the mechanisms that drive sustained behavior change.

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