

# AI-ENABLED WEARABLES FOR FITNESS AND PREVENTIVE HEALTH

MT4



J. BRANTES FERREIRA<sup>1</sup>, J.F. DA SILVA<sup>1</sup>, F.L. RAMOS<sup>1</sup>, C.J. GIOVANNINI<sup>1</sup>, D.B. FERREIRA<sup>2</sup>

<sup>1</sup>Pontifical Catholic University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil

<sup>2</sup>Ambra University, Orlando, FL, USA.

## INTRODUCTION

AI-enabled wearable sensors offer continuous, individualized monitoring that can support prevention and self-management, but clinical gains require adoption and engagement across diverse populations. Understanding how people's health beliefs shape their adoption is therefore essential to designing effective, equitable interventions that translate wearable capabilities into public health impact.

## OBJECTIVE

Explore how **health beliefs** influence the **use of AI-enabled fitness wearables for preventive health in Brazil**, using the **Health Belief Model (HBM)**. The research examines constructs like **perceived susceptibility to chronic diseases**, **benefits of monitoring**, and **barriers to self-monitoring** among adults, highlighting **behavioral motivation in preventive care**.

## METHOD

- **Cross-sectional Survey** with 600 adult Brazilian respondents
- Assessed **HBM constructs**: perceived susceptibility to chronic diseases, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy for exercise.
- **Fitness tracker use** was recorded.
- **Hierarchical cluster analysis** (belief profiles x wearable adoption)

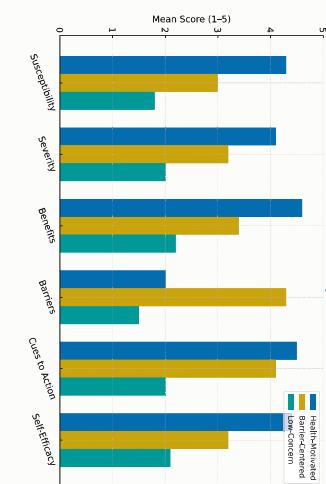
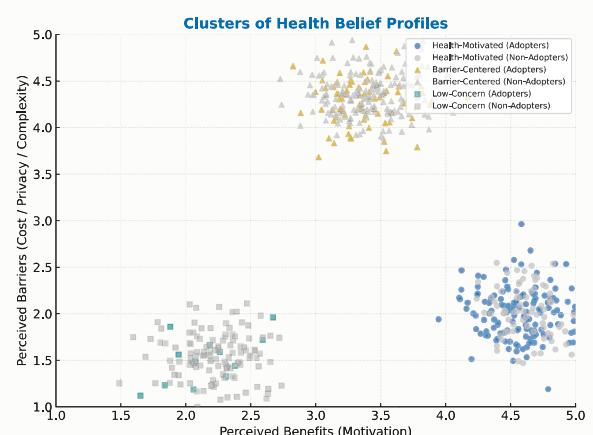
## RESULTS



Three distinct clusters emerged:

- Health-Motivated
- Barrier-Centered
- Low-Concern

The **Health-Motivated** cluster demonstrated a **strong belief in the benefits and cues to action**, resulting in high adoption rates. The **Barrier-Centered** group cited **cost and privacy as major obstacles despite recognizing benefits**. **Low-concern** individuals doubted the personal risk and saw **minimal benefit**, resulting in very low adoption rates.



## CONCLUSIONS

Adoption of AI fitness wearables is driven by individuals' health beliefs. Interventions for **preventive health** should target belief **barriers**: for example, providing subsidized devices and privacy assurances to the Barrier-Centered group, and risk-awareness campaigns for Low-Concern individuals. **Tailored interventions** (such as targeted education and subsidized device programs) can **overcome belief-driven barriers** and increase wearable use.

## REFERENCES

Kim, B., Hong, S., & Kim, S. (2021). Introducing an Integrated Model of Adults' Wearable Activity Tracker Use and Obesity Information-Seeking Behaviors from a National Quota Sample Survey. *JMIR Formative Research*, 5(9), e22327.

Meier, D. Y., Barthélémy, P., Sun, W., & Liberatore, F. (2020). Wearable Technology Acceptance in Health Care Based on National Culture Differences: Cross-Country Analysis Between Chinese and Swiss Consumers. *Journal of Medical Internet Research*, 22(10), e18801.

Rising, C. J., Gaysinsky, A., Blaize, K. D., Jensen, R. E., & Oh, A. (2021). Willingness to Share Data From Wearable Health and Activity Trackers: Analysis of the 2019 Health Information National Trends Survey Data. *JMIR mHealth and uHealth*, 9(12), e29190.

Shojari, S., Kuruvinashetti, K., Komeili, A., & Sundarraj, U. (2023). The Emergence of AI-Based Wearable Sensors for Digital Health Technology: A Review. *Sensors*, 23, 9498.

Lenox, A., Müller, R.-a., & Coffie, J. S. (2024). Encouraging Continuous Usage of Wearable Activity Trackers: The Interplay of Perceived Severity, Susceptibility and Social Media Influencers. *International Journal of Environmental Research and Public Health*, 21, 1549.

## CONTACT INFO

Jorge Brantes Ferreira jorgebf@gmail.com