

Workplace wellness programs could improve if more personalized, study shows

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A new study found that personal and psychological characteristics are strongly tied to people's progress—or lack thereof—when they participate in programs designed to nudge them toward increased physical activity. The analysis, by researchers in the Perelman School of Medicine at the University of Pennsylvania and Deloitte was published today in *PLOS One*.

This research was an expansion of a similar study published in 2019, which analyzed a [physical activity program](#) called STEP UP. The program aimed to increase the step counts of roughly 600 Deloitte professionals classified as being either obese or overweight over a period of six months.

"A one-size-fits-all approach to nudging new behaviors within wellness programs can have limited success," said senior author Mitesh Patel, MD, director of the Penn Medicine Nudge Unit. "We've shown that different forms of nudging can be effective, and in this latest study on this program, we've now demonstrated that matching nudges to the right behavior profiles can unlock their full potential."

In the STEP UP program, personalized daily step counts were established for each participant, but they were then randomly funneled into four different groups: one that just gave the participants their goals and a step tracker, and three others that mixed in different forms of nudges that were "gamified" using a point system. The gamified portions of this trial proved to be effective.

"The STEP UP trial demonstrated that gamification works—with the competition arm outperforming other study arms on average—and this further analysis confirms that wellness programs should not be designed around just the average person," said Greg Schwartz, managing director and life sciences data science practice lead, Deloitte Consulting LLP. "Instead, programs should allow individuals to operate in the incentive scheme most likely to work for them, creating a more personalized experience that delivers improved outcomes based on scientific approaches to engagement."

For the new analysis, the researchers divided everyone into different classifications of certain psychological and [behavioral characteristics](#) that the researchers called "phenotypes."

"Participants in the study had completed surveys to help us hone in on their personality type, [social support](#), risk preferences, and other factors," said first author Shirley Chen, MD, who was a general internal medicine fellow in the Health Policy Research Program at Penn Medicine and now an assistant professor of Medicine and medical director of Provider Engagement, Population Health, at Mount Sinai Health System in New York City. "We used a statistical method called latent class analysis that takes this information and identifies a hidden pattern that links groups of people together based on their behavioral phenotype."

The phenotypes that emerged were: "more extroverted and more motivated," accounting for 54 percent of study population; "less active and less social," which was 20 percent of the participants; and, finally, "less motivated and at-risk," a group that contained the remaining 25 percent.

Stark differences were observed in how each phenotype responded to the study's different gamification methods. Those in the

extroverted/motivated group significantly improved their daily step counts by an average of 945 steps when they took part in the competition form of gamification, but these changes went away after the intervention stopped.

"This suggests that ongoing incentives and reminders may be necessary to sustain motivation for some groups of people," said Chen.

Those who were in the second class, "less active and less social," responded significantly to all forms of gamification when compared to participants in the control group who did not take part in the gamified portion of the [program](#). During the 3-month follow-up period, these levels of activity were sustained, indicating that this group formed lasting habits.

"They had the most to gain," Patel said. "So it was rewarding to see that this group benefited the most and their behavior was sustained even after the interventions stopped."

When it came to the last phenotype, those who were less motivated and at-risk, the study actually found no differences when they participated in the study. While some of the gamified methods did not result in changes for some of those who participated, it was not a failure. In fact, in many respects, showing that they could find out who these nudges don't work for is as valuable as finding who they do work for.

"Broadly, our findings demonstrate that behavioral interventions have different effects on different people and one size does not fit all," Chen said. "The concept of constructing behavioral phenotypes is a promising approach to designing and targeting behavioral interventions based on meaningful individual differences."

Provided by Perelman School of Medicine at the University of Pennsylvania

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