

Pokémon GO: snake oil or miracle cure for physical inactivity?

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The term “snake oil” was popularized in the early 1900s as a miracle cure-all, and later, after uncovering that it was made up of no more than mineral water and turpentine, it was coined as a term for someone selling products with fraudulent, questionable, or unverifiable benefits (1). Pokémon GO, released in July 2016, quickly became the world's most downloaded smartphone application, surpassing Twitter and Candy Crush within the first two weeks of its release (2). Initial reports and anecdotal evidence suggested that Pokémon GO might be the panacea researchers have been searching for to solve the global physical inactivity crisis. However, less than a year later, we understand that after the initial excitement subsided, Pikachu was not able maintain an increase in habitual physical activity. Pokémon GO may be just snake oil.

If we go back to the evidence, this should not come as a shock. The science is clear; behavior modification is hard, and it is especially hard to sustain improvements in health-promoting behaviors over a long period of time. Population and public health researchers will agree that one of the most important behaviors we can change is increasing daily moderate- to vigorous-intensity physical activity; ideally at least 30 minutes of heart-pumping activity every day in adults. However, even though most of us know that being active is important for health, we are in the midst of a global physical inactivity crisis (3). This reality is costing health care systems billions in additional expenditures, and

workforces almost as much in lost productivity (4). Recent estimates suggest that physical inactivity costs \$53.8 billion (international adjusted currency) annually worldwide (5). More importantly, physical inactivity is the second leading cause of preventable death worldwide (after smoking), and there is no indication that this will change any time soon (6).

Currently, some of the most convincing evidence we have is that the majority of physical activity interventions are not sustainable (7). In fact, there has yet to be a population health intervention that can be considered effective, feasible, sustainable, and scalable over the long term (8). Many physical activity programs have shown modest success in the short term, but none of them have reached a level that is considered successful on a population level standpoint (8).

One important barrier to strategies that aim to make people move more and sit less is our fast-paced and technophilic society. Lack of time and obsession with screens are important factors that can impede the success of physical activity interventions in today's world. Excess screen time has been shown to be associated with adverse health outcomes in many studies (9); however, screen time can provide valuable benefits and scientists are starting to embrace the “good side” of screens, i.e., the cognitive, social, motivational, and behavioral effects that certain types and contexts of screen time can provide (10). This is certainly not a bad idea. Screens are not going to disappear in a near future, and if they can support some people to make healthier lifestyle choices (e.g., going more outside

and moving more), then researchers should embrace, not boycott their development.

With the advent of new technologies and the popularity of gamification there is potential for screen time to play a prominent role in facilitating behavior change, including increasing habitual physical activity (11). One interesting screen type in this regard is the smartphone. Smartphones are portable, convenient, and relatively accessible. The vast majority of people in developed countries report owning a smartphone, and smartphone ownership in developing countries is rising rapidly (12). Smartphone technology is undoubtedly a source of pleasure and entertainment for many people, and an accumulating body of evidence shows that smartphones have great potential for physical activity promotion (13).

All things considered, Pokémon GO held the potential to be a panacea—a fun game, played on a smartphone, freely accessible to individuals around the globe. For the unacquainted reader, Pokémon GO is an augmented reality mobile game in which players search real world locations looking for cartoon characters. Once they appear on screen, the objective is to “catch them” using the touchscreen functionality of the smartphone. To advance in the game, players are required to walk (sometimes long distances) to catch characters, achieve bonuses, and “hatch” new characters. Players can also compete against each other in “gyms” to earn bonus points and advance their respective characters. The game makes use of integrated Global Positioning System (GPS) and step-counter features of the smartphone to ensure players are playing honestly and fairly.

Early reports suggested that Pokémon GO was able to increase physical activity and improve public health, but these claims were largely based on anecdotal evidence and preliminary reports (14). The hype around the release of Pokémon GO was massive and the excitement around it was evident—but was it just snake oil? Pokémon GO was seemingly able to not only increase physical activity, but also outdoor time at the expense of indoor time (with all the additional health benefits of spending more time outdoors). Additionally, people were using “Poké-walks” as an excuse to go out with friends, or engage with other Pokémon players. The impacts were especially pronounced in those that were not typically motivated by traditional gyms or sports venues. In short, initial reports suggested that Pokémon GO was successful where previous interventions had failed.

But the key question remained: is this engagement

sustainable over time, and is the impact enough to improve health? Many months have now elapsed since the release of Pokémon GO by Niantic, and studies are now starting to get published on the efficacy of this game as a tool to increase physical activity (and hopefully also reducing the associated health risks).

One such study by Howe and colleagues was recently published in the *British Medical Journal* (15). This elegant and timely study aimed at estimating the effect of Pokémon GO on the number of steps taken daily up to 6 weeks after installation of the game. To do so, the authors conducted an online survey using the Amazon Mechanical Turk, an online marketplace where individuals can submit responses or participate in tasks to earn rewards. They recruited 1,182 participants aged 18–35 years, residing in the United States, and using iPhone 6 series smartphones (these devices automatically record the number of steps taken while carrying the device). They observed that approximately half of the survey participants reported playing Pokémon GO and got on average 4,256 steps each day in the four weeks before installation of the game. The corresponding number for non-players was similar (4,126 steps/day). Although playing Pokémon GO was common across various subgroups of the population, a key observation was that players tended to be younger, had a lower education and household income, had higher levels of obesity, were more likely to be single, and less likely to be black compared with non-players.

The results they obtained were fascinating, but not surprising given what we know about behavior change. After installation of the game, the daily steps among players increased sharply (i.e., by approximately 1,000 additional steps during the first week of installation) before gradually returning to pre-installation levels in week 5, whereas the number of daily steps for non-players remained very similar throughout the study period. The authors did not find significant effect modification of Pokémon GO by age, sex, race, body weight status, urbanity or walkability of the area of residence, suggesting that the findings were seen regardless of these potential confounding factors. Overall, these findings suggest that the impact of Pokémon GO on increasing physical activity is short lived. An excitement was noticed in some people with the release of Pokémon GO, which led to a moderate increase in physical activity level (about 11 minutes of additional walking daily); however, this increase in daily steps taken declined gradually over time and was no longer observed after only 6 weeks after installment of the game (15). Based on this well-designed

and robust study, Pokémon GO may well be closer to snake oil than a panacea.

As discussed in recent editorials and commentaries (16-18), Pokémon GO was able to generate a lot of initial interest from the general public, but like many physical activity interventions, as the initial excitement wanes long-term adherence is low. However, despite disappointing results on long term adherence, we can learn a great deal from Pokémon GO. Most importantly, Pokémon GO has succeeded where most population health strategies have failed in its ability to increase physical activity level among “at-risk” individuals, i.e., obese and inactive people coming from lower socioeconomic backgrounds. Further, Pokémon GO was also associated with increased time spent outside as well as increased socialization and visits to public parks, museums, and historical sites (19). On the other hand, risks associated with the game have been well publicized, including cases of injuries and road traffic accidents (20). But most impactful on a societal level is the fact that Pokémon GO was not able to sustain long-term engagement and did not lead to sustained behavior change, suggesting that it is unlikely to have any positive impact on health outcomes.

In conclusion, it is important to remind ourselves that long term behavior change is extremely difficult. Pokémon GO is not different than other physical activity interventions in this regard, and we should not be surprised of the outcomes. Long-term success of large-scale behavior change interventions is very rare (21). However, the short-term increases in physical activity with the use of Pokémon GO were not restricted to already active and healthy individuals, but specifically reached sub-groups of the population considered “at-risk” for health problems. Whether this is due to their increased interest in screen-based technology remains to be seen. If this is indeed the case, this would suggest that using technology as part of the solution rather than part of the problem could result in important gains for public health. All in all, Pokémon GO was indeed a fad, but this naturalistic “geocaching” experiment taught us some good lessons to move forward.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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