
Investigating self-tracking technology use in older adulthood

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Abstract

The ability to meet users' needs in different contexts and different stages of life is essential for supporting long-term self-tracking. Older adults use self-tracking for health management more than any other age group, but they have not adopted self-tracking technology. In this paper, we discuss barriers to adoption that we have found in our work and describe opportunities for future research to investigate how to meet the needs of senior users better.

Author Keywords

older adults; self-tracking

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H.5.m [Information interfaces and presentation (e.g., HCI)]:
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Introduction

Investigating tracking practices at different stages of life can contribute to how we understand long-term tracking. As people age, their contexts, needs, and interests often change. Aspects of their lives that are commonly subject of tracking, such as health, finances, and daily habits, can change substantially over a period of several years. Supporting long-term tracking requires adapting to those changes to meet the needs of users at different stages of their lives.

In our work, we investigate the habits and beliefs surrounding self-tracking practices of older adults, with a focus on health management. According to a 2012 survey, people who are 65 and older are more likely to use tracking for health than any other age group in the U.S., yet they rarely use self-tracking technology [5]. We are interested in understanding how seniors currently engage in self-tracking, the barriers that inhibit the use of self-tracking technology, and how to make progress towards overcoming these barriers.

Unlike younger adults, who often engage in fitness tracking, seniors are more likely to track health indicators that are not related to fitness, such as blood pressure and blood glucose. They most often use memory or paper to record tracked data, and their self-tracking goals include managing chronic conditions, and detecting health issues early [1, 5]. In the next section, we illustrate barriers to self-tracking among seniors that we have found. These findings are from an interview study with 18 older adults (74 to 100 years old) that focused on their current self-tracking practices and technology use.

Barriers to adoption

The primary barrier we observed was not perceiving exercise tracking as useful for providing motivation, or otherwise supporting people who want to exercise more. To illustrate this barrier, we describe Lin's perspective regarding self-tracking devices. Lin was an 80-year-old participant who had been physically active her entire life. For several years she used a pedometer she had received from her health insurance company. Lin found it easy to reach the daily goal of 10,000 steps by following her routine and did not go out of her way to reach it. At the time of the interview, she was not tracking her steps because she was recovering from hip surgery. Lin was able to walk on her own and exercised daily. She had purchased a Fitbit device, but she was

waiting to use it when she fully recovered. For Lin, tracking steps was a tool used to validate her activity, only useful when she was capable of reaching that goal. Although step tracking has been used as a tool in surgery recovery before (e.g., [8]), she did not see it as useful during that period of her life.

Most participants shared Lin's perspective. They did not find self-tracking technology useful for supporting behavior change regarding exercise. Those participants who tracked their exercise used mobile devices in order to validate their daily activity. They were already physically active and did not see tracking as a tool to motivate them.

Participants who were less active and were interested in exercising more expressed how the kind of feedback provided by tracking steps was not as motivating as the benefits they received from exercising, such as improved symptoms or improved balance or gait; or even social accountability from scheduling a time with a trainer or friend. Further, many of them reported that they had experienced adverse effects from particular kinds of exercise or due to exercising too much. After these instances, they had to change their habits or goals regarding physical activity.

Many participants tracked other health indicators, such as blood pressure, blood glucose, or pain. Not one of them used technology to record the data, however. Most wrote the data on paper, but a few did not register it. Most participants who wrote their data on paper shared it with their physicians by bringing it with them when they had an appointment. In this case, the seniors did not find they could benefit from using technology for tracking, as using paper was enough for their needs. Further, using tracking technology required substantial effort since most participants did not own a smartphone, or did not use it extensively. We did find that a few seniors who had a heart condition used

heart rate monitors not to exceed a range of heart rate they considered safe during exercise.

Other participants did not use tracking because they already knew their habits, or because they found existing devices inaccurate. A few said that their diet or exercise did not vary much, so they did not see a benefit in tracking. For instance, they took the same paths when walking and knew already how long they were. Multiple participants said that they had tried using step tracking devices in the past, but found that they underestimated their activity by a large margin. This low accuracy is likely caused by having a different or slower gait or using walking aids such as walkers and canes.

Discussion

Seniors see self-tracking technology as a tool they can use to monitor exercise habits when they are highly physically active, but not when trying to become more active, or to reach other goals (e.g., recovering from an incident or managing symptoms). Similarly to monitoring their blood pressure, they use exercise tracking to check that their levels are at a desired range [1]. Differently from what is common in other contexts, these systems are not seen as a tool for increasing physical activity levels.

We believe that this barrier is influenced by a misalignment between how activity trackers are designed, and seniors' needs and contexts. For many seniors, reaching the general goal of 10,000 steps might be unrealistic, and pursuing it could be harmful. Finding the right amount of exercise to aim for involves reading how their body responds to different activities. Further, their exercise goals often include management of pain and other conditions, improving balance, and maintaining their ability to care for themselves. Self-tracking technology might need to collect different data

and provide specific feedback to support these needs.

Many seniors monitor health indicators such as blood pressure and glucose continuously. The effort required for using technology for registering those data discourages adoption. Features such as automatic data storage, visualization tools, sharing with doctors automatically, integration with patient portals, and designs that could help seniors to make sense of the data on their own would likely make these systems more attractive to the senior population. These features would provide more value to users, and also reduce the effort required to use them.

A few barriers found in this project are similar to what previous work has found. Seniors were less likely to use self-tracking due to already knowing the data, and effort required, as observed by Epstein et al. [4]. They also had life circumstances not aligned with tracking, were frustrated due to low accuracy, findings consistent with other previous work [2, 3]. Seniors are most often in maintenance mindset, and as Fritz et al. also found [7], users can become less interested in systems that do not support maintenance well.

Other barriers are specific for this population. Their particular goals for tracking (e.g., pain management as opposed to improving fitness) are different to what available mainstream tools address. And lower accuracy, likely influenced by having a slower gait or using walking aids. Not finding the tool useful for behavior change, a common perspective among the participants, led to lapse or abandonment when the person no longer can maintain high activity levels. French et al.'s finding that common strategies used in the design of self-tracking systems are less effective for seniors in comparison with the younger population might partially explain this perception [6].

In summary, technology for long term self-tracking requires

supporting life and context changes that affect the activity being tracked, as well as people's motives for tracking. This paper illustrates a few of the barriers that exist for seniors in regards to using self-tracking technology. Improving how this technology serves the needs of older adults is a step towards to support long term tracking.

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