

Mobile Health Tracking among Cancer Survivors

The number of cancer survivors in the United States is projected to reach 26 million by 2040. Many survivors experience treatment side effects, psychological distress, and decreased quality of life, and do not meet established guidelines for recommended health behaviors (such as exercise). Mobile technology and wearable devices may provide an opportunity to improve care and health outcomes among cancer survivors by enabling the continuous, unobtrusive capture of health-related data using products that many individuals already own.

These data could supplement information collected during clinic visits and support proactive, timely, and personalized care (particularly in the post-treatment phase when encounters with the health care system become less frequent). For example, tracking changes in physical activity or sleep could help identify patients who are at risk for adverse outcomes and enable earlier intervention with tailored lifestyle or symptom management support. Sharing health information from mobile and wearable devices with providers could also facilitate patient-centered care through increased engagement and improved communication. However, the ability to leverage digital health data to improve care and inform clinical decision-making relies on patients' ability and willingness to collect and share these data with providers.

Additionally, because wearable devices and smartphone apps can provide just-in-time data and feedback directly to patients, they can also be used to support healthy behaviors among cancer survivors. For example, prior research shows that interventions utilizing wearable activity monitors had a positive impact on cancer survivors' physical activity and that cancer survivors who had health applications installed on their mobile devices were more likely to meet guidelines for fruit and vegetable intake and strength training.

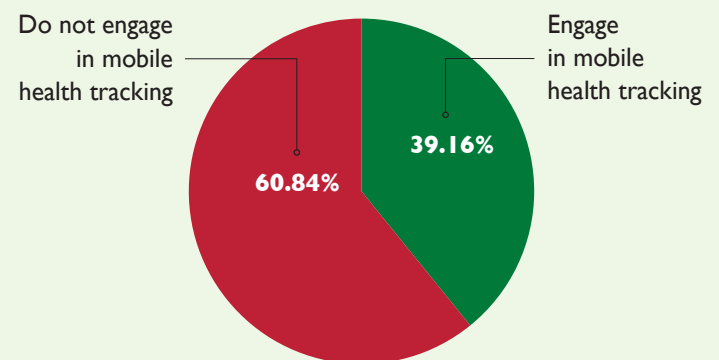
Overall, cancer survivors are as likely as the general population to use health apps and wearable devices and to find these tools helpful in monitoring their health, suggesting that these digital technologies may be able to help address unmet needs in cancer survivors. However, prior research has also found differences in ownership

and use of these technologies among cancer survivors by sociodemographic characteristics, such as age and socioeconomic status. Understanding characteristics that influence health tracking could help identify survivors who might benefit from mobile tracking but need additional support in utilizing these technologies.

Quick Facts

- The widespread adoption of mobile technologies and wearable devices provides an opportunity to enhance survivorship care and improve health outcomes among cancer survivors by enabling the continuous capture of fine-grained health-related data.
- Data collected from patients' digital devices could support proactive, timely, personalized, and patient-centered care.
- Mobile health tracking can support cancer survivors in making or maintaining healthy lifestyle changes.
- In 2021, 39% of cancer survivors sampled from three Surveillance, Epidemiology, and End Results (SEER) registries reported engaging in mobile health tracking using either a mobile app or an electronic wearable device.

Percentage of cancer survivors in HINTS-SEER who reported engaging in mobile health tracking



Source: Analysis of HINTS-SEER (2021) data in Hong (2024)

Prevalence and Predictors of Mobile Health Tracking among Cancer Survivors

A recently published analysis of HINTS-SEER (2021) data assessed the prevalence and predictors of mobile health tracking among cancer survivors. Tracking was defined as either using an app on a tablet or smartphone to track progress on a health-related goal (such as quitting smoking, losing weight, or increasing physical activity) or using an electronic wearable device (e.g., Fitbit, Apple Watch, or Garmin Vivofit) to monitor or track health or activity. The analysis found that 39% of sampled survivors engaged in mobile health tracking. Additionally, most survivors who engaged in mobile health tracking using wearable devices reported that they would be willing to share these data with a health care provider (86%).

In weighted, multivariate logistic regression analyses, engaging in mobile health tracking was associated with younger age (compared to being 75 years of age or older), being female (compared to being male), having a college degree (compared to having a high school education or less), and having excellent or very good perceived health (compared to poor or fair perceived health).¹

¹ NOTE: The HINTS-SEER data set includes 1,234 cancer survivors sampled from three SEER cancer registries (Iowa Cancer Registry, Greater Bay Area Cancer Registry, and New Mexico Tumor Registry). The weighted data from HINTS-SEER provide point estimates for, and represent, the total populations of the three registries who met the eligibility requirements and are not representative of all cancer survivors in the United States.

How Can This Inform Your Work?

A notable percentage of cancer survivors sampled from three SEER registries report engaging in mobile health tracking and being willing to share data from their devices with health care providers. This suggests the feasibility and potential of using patient-generated digital data for improving health care and health outcomes in the survivor population. Digital data can supplement information gathered during clinical encounters and facilitate symptom management, informed decision-making, patient-provider communication, and behavior change. However, there are currently challenges to fully leveraging data from patient-owned devices in clinical care. For example, there are barriers to integrating these data into existing electronic health record systems and clinic workflows, as well as difficulties transforming large quantities of mobile data into actionable recommendations. Addressing these issues, as well as provider concerns about the accuracy and sharing of digital data, could help increase the use of mobile health tracking data in clinical care.

In addition to facilitating the integration of digital data into care, efforts are also needed to support cancer survivors in tracking their health using mobile devices and sharing these data with their health care team. This might be accomplished through discussions between survivors and providers regarding risks and benefits of collecting and sharing these data, and how the data can be used in clinical decisions and to support patient goals. Setting expectations and addressing concerns regarding data privacy could also help increase comfort and compliance with mobile health tracking and data sharing.

HINTS-SEER data suggest that providers need to be aware of differences in mobile health tracking by sociodemographic factors, such as age and education level, so they can provide tailored support to survivors who are not currently using digital tools to monitor their health but may benefit from doing so. For example, clinicians and health systems could provide technical support and patient education to assist survivors with using mobile technologies and sharing data from these devices with providers. This support may be especially important for older survivors who might own these devices but have difficulty fully utilizing their capabilities due to limited digital literacy.

About HINTS

hints.cancer.gov

The National Cancer Institute (NCI) created the Health Information National Trends Survey (HINTS) to monitor changes in the rapidly evolving field of health communication. The survey data can be used to understand how adults use communication channels to obtain health information for themselves and their loved ones. HINTS data can also help practitioners create more effective health communication strategies. The HINTS survey has been fielded 17 times to date.

HINTS Briefs provide a snapshot of noteworthy, data-driven research findings that may be of interest to the HINTS community. The Briefs summarize research findings from recently published peer-reviewed journal articles analyzing HINTS data.

For More Information on Cancer

- Call the NCI Cancer Information Service at 1-800-4-CANCER
- Visit <https://www.cancer.gov>
- Download NCI publications at <https://pubs.cancer.gov/ncip/home.aspx>
- Visit [Facebook.com/cancer.gov](https://www.facebook.com/cancer.gov) and <https://www.youtube.com/ncigov>

References Used in This Brief

- Hong YA. Mobile health and behavior tracking (mHBT) among cancer survivors: results from a large and diverse sample. *Mhealth*. 2024;10.
- Office of Cancer Survivorship. Statistics and Graphs. 2024. <https://cancercontrol.cancer.gov/ocs/statistics>
- Low CA. Harnessing consumer smartphone and wearable sensors for clinical cancer research. *NPJ Digit Med*. 2020 Oct;3(1):140.
- Griffin AC, Chung AE. Health tracking and information sharing in the patient-centered era: a Health Information National Trends Survey (HINTS) study. In *AMIA Annual Symposium Proceedings 2020 Mar* (Vol. 2019, p. 1041).
- Onyeaka HK, Zambrano J, Longley RM, Celano CM, Naslund JA, Amonoo HL. Use of digital health tools for health promotion in cancer survivors. *Psycho-Oncology*. 2021 Aug;30(8):1302-10.
- Omoloja A, Vundavalli S. Patient generated health data: benefits and challenges. *Curr Probl Pediatr Adolesc Health Care*. 2021 Nov 1;51(11):101103.



NATIONAL CANCER INSTITUTE
Division of Cancer Control
& Population Sciences