

Digital Health Tools to Support Cancer Survivorship

Due to an aging population and improvements in the early detection and treatment of cancer, the number of cancer survivors continues to increase. It is projected that by 2030 there will be more than 22 million cancer survivors in the United States. Individuals with a history of cancer may have unique needs related to the long-term impacts of cancer and its treatment, such as pain, fatigue, and psychological distress. Survivors are also at increased risk for second primary cancers, other comorbid conditions, and mortality. However, despite these risks, research suggests that many survivors do not adhere to health behavior recommendations that could improve their quality of life, mitigate late effects, and reduce the risk of cancer and other chronic diseases. Moreover, many survivors report having unmet supportive care needs.

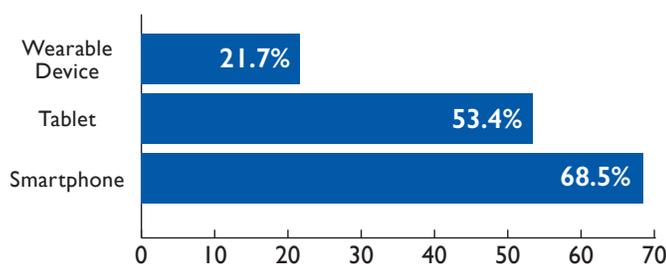
Digital health tools such as mobile health applications and wearable devices can improve the health and well-being of cancer survivors by supporting patient education, health behavior change, and symptom management. These tools also enable the delivery of interventions that are responsive, personalized, and available on demand. Studies have shown that digital interventions can be effective in increasing physical activity, supporting weight management, increasing

Quick Facts

- As of January 2019, there were an estimated 17 million cancer survivors in the United States, and it is projected that this number will increase to more than 22 million by 2030.
- Digital health tools such as mobile apps and wearable devices may support cancer survivors with engaging in health promoting behaviors and navigating their survivorship care.
- Cancer survivors are just as likely as the general population to own and use digital health tools, but there are disparities in digital health tool ownership and usage among survivors by age, income, and education level.
- Survivors who have health-related apps installed on their mobile device have greater odds of meeting dietary and physical activity recommendations compared to survivors who don't have these apps.

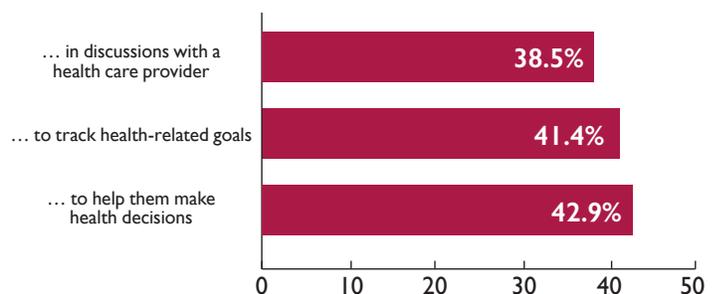
medication adherence, and improving symptoms like fatigue and pain among cancer survivors. Additionally, digital health tools can remove many of the logistical barriers that are associated with in-person care and participation in traditional health promotion programs (such as time and travel burden), which could make digital modalities especially useful in the cancer survivorship context.

Percent of Cancer Survivors Who Own a Digital Device



Source: Analysis of HINTS 5 Cycle 3 data in Onyeaka et al. (2021)

Percent of Cancer Survivors Who Use Digital Devices



Use of Digital Health Tools among Cancer Survivors

A recent study used HINTS 5 Cycle 3 (2019) data to examine differences in use of digital health tools between cancer survivors and the general population, assess the relationship between digital health tools and health behaviors among survivors, and identify sociodemographic predictors of digital health tool utilization among survivors. The analysis found that ownership and usage of digital health tools did not differ by cancer survivorship status: cancer survivors had similar odds of tablet and smartphone ownership, wearable device use, and having health-related apps on their mobile device as the general population. They were also just as likely as individuals without a cancer history to report that digital health tools helped them in discussions with their health care provider, helped them track health-related goals, and helped them in making medical decisions.

The study also found that cancer survivors who had health-related apps installed on their mobile device were more likely to meet national recommendations for diet, physical activity, and strength training compared to survivors who did not have these apps, suggesting that digital health tools can support health promotion efforts in this population. However, the analysis also pointed to significant disparities in digital health tool ownership and usage among survivors by age, income, and education: survivors with a college or postgraduate degree were more likely to have health apps compared to those with less than a college education, and survivors 65 years of age or older and those with less than \$20,000 in annual income were significantly less likely to use a wearable device than survivors ages 18–64 and those with an annual income of \$75,000 or more, respectively.

How Can This Inform Your Work?

Digital health tools have the potential to enhance survivorship, and clinicians and caregivers may wish to leverage these tools to support patients in adopting healthy behaviors and becoming more engaged in their care. However, the use of digital tools is not equitable, and some cancer survivors (e.g., older individuals) may need more support to fully benefit from these tools. Providers can assist these patients and their caregivers by identifying affordable, high-quality apps or devices, explaining how these tools can enhance survivorship, and demonstrating how to use them. Once patients start using digital health tools, providers may encourage ongoing engagement with these technologies by collaboratively reviewing the data collected by the device or app, and helping to make the data actionable. Integrating data from these digital health tools into patient medical records may also improve care, for example by supplementing the information that providers collect during brief clinical encounters, and enabling ongoing symptom monitoring.

Public health practitioners can help cancer survivors harness the benefits of digital tools by creating resources that help survivors navigate available health technologies and select evidence-based tools that are appropriate for their budget, preferences, and goals. To ensure that the use of digital technologies in survivorship care does not further exacerbate health disparities, practitioners can also work to identify and address barriers to the use of digital health tools among different groups of survivors, for example by offering digital literacy training to survivors who express a lack of confidence in using technology.

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 13 times to date.

HINTS Briefs provide a snapshot of noteworthy, data-driven research findings. They introduce population-level estimates for specific questions in the survey and summarize significant research findings resulting from analyses of how certain demographic characteristics influence specific outcomes. Many Briefs summarize research findings from recent peer-reviewed journal articles that have used HINTS data.

For More Information on Cancer

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

References Used in This Brief

- Onyeaka HK, Zambrano J, Longley RM, Celano CM, Naslund JA, Amonoo HL. Use of digital health tools for health promotion in cancer survivors. *Psychooncology*. 2021;1-9. doi:10.1002/pon.5677.
- American Cancer Society. Cancer survivors predicted to number over 22 million in U.S. by 2030. 2019. <http://pressroom.cancer.org/SurvivorshipStats2019>.
- Harris J, Cheevers K, Armes J. The emerging role of digital health in monitoring and supporting people living with cancer and the consequences of its treatments. *Curr Opin Support Palliat Care*. 2018;12(3):268-275. doi:10.1097/SPC.0000000000000362.
- Hyland KA, Jacobs JM, Lennes IT, Pirl WF, Park ER. Are cancer survivors following the national comprehensive cancer network health behavior guidelines? An assessment of patients attending a cancer survivorship clinic. *J Psychosoc Oncol*. 2018;36(1):64-81. doi:10.1080/07347332.2017.1399193.
- Roberts AL, Potts HW, Koutoukidis DA, Smith L, Fisher A. Breast, prostate, and colorectal cancer survivors' experiences of using publicly available physical activity mobile apps: qualitative study. *JMIR Mhealth Uhealth*. 2019;7(1):e10918. doi:10.2196/10918.



NATIONAL CANCER INSTITUTE
Division of Cancer Control
& Population Sciences