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eHealth literacy in older adults with cancer

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Abstract

Objective: Recent advances in health monitoring technology have coincided with increases in the number of older adults with cancer, many of whom report difficulty using health information technology (HIT). Previous studies have identified lower electronic health (eHealth) literacy among older adults (≥ 65 years) compared to younger adults (<65), but studies in older adults with cancer are limited. The goal of this study was to examine age differences in eHealth literacy and use of technology devices/HIT in patients with cancer, and characterize receptivity towards using home-based HIT to communicate with the oncology care team.

Materials and Methods: Patients (n = 198) in a Radiation Oncology clinic were offered an anonymous written questionnaire assessing demographics, eHealth literacy (eHealth Literacy Scale), current use of HIT, and interest in using home-based HIT.

Results and Conclusion: Compared to younger patients, older patients had significantly lower eHealth literacy ($p < .01$), and were less likely to feel confident evaluating health resources on the Internet ($p < .01$) or knowing how to use the health information found on the Internet to help them ($p < .01$) or answer health questions ($p = .01$). Older patients were also less likely than younger patients to have an email address ($p = .04$), own a smartphone ($p < .01$), or use the online patient portal ($p = .03$). Regardless of age, most patients were not opposed to using home-based HIT to communicate with their oncology care team. Future studies on HIT use in older adults with cancer should further evaluate barriers to using HIT and ways to maximize implementation and accessibility.

Keywords

Digital health literacy; eHealth; Cancer; Health information technology; Age

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Author Contributions

AH – study concepts, study design, data analysis and interpretation, statistical analysis, manuscript preparation, manuscript editing, manuscript review. JM, EL, HB, and PJ – data analysis and interpretation, manuscript preparation, manuscript editing, manuscript review. HJ – study concepts, study design, data analysis and interpretation, manuscript preparation, manuscript editing, manuscript review.

Declaration of Competing Interest

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1. Introduction

Health information technology (HIT) is increasingly used to enhance and facilitate oncology care. Recent literature suggests that over 90% of patients with cancer use the internet to access information about cancer [1]. Home-based HIT, such as web-based platforms accessible by a tablet, computer, or smartphone, offers patients with limited mobility or transportation difficulties, including older adults (e.g., > 65 years), access to care and provider communication that might otherwise be out of reach. However, older adults cite numerous barriers to HIT use, such as difficulty navigating the computer/internet, knowing which resources to trust, logging into patient portals, physical limitations that reduce accessibility (e.g., difficulty reading text on screens), and privacy/security concerns [2-4]. Consequently, overall use of HIT is suboptimal among older adults.

Among older adults with cancer, little is known about HIT use and patients' ability to use and evaluate health information on electronic devices (i.e., 'eHealth' literacy) [5]. This is surprising, considering that cancer is commonly diagnosed in adults over the age of 65. Literature on HIT use in mixed age samples of individuals with cancer suggests that health information accessed through the internet can contribute to feelings of empowerment and is an important means of becoming informed about a cancer diagnosis, particularly when in-person communication with a healthcare provider is poorly understood or retained [6]. Further, results of a large randomized clinical trial [7] found that among patients with cancer who use HIT, those with low eHealth literacy, who were typically older, had fewer ER visits and hospitalizations and improved survival rates at one year compared to patients with high eHealth literacy, who were typically younger. As digital innovations increasingly become a routine part of oncology care, a current evaluation of older patients' with cancer eHealth literacy and HIT use is critical to ensuring that older adult cancer patients' needs and abilities are considered when designing and implementing new HIT platforms.

Given the state of the literature, the aim of this study was to evaluate eHealth literacy and HIT use in older adults diagnosed with cancer through the use of an anonymous survey. We hypothesized that eHealth literacy and use of HIT would be lower among older patients (> 65 years) as compared to younger patients (<65 years).

2. Materials and Methods

2.1. Procedure

An anonymous survey was provided to patients in the Radiation Oncology clinic waiting room. Patients were eligible if they were currently receiving treatment at Moffitt Cancer Center and capable of speaking and reading English. Data were collected between July 2018 and September 2018. Because the questionnaire did not contain personal health information, informed consent was not obtained. This study was approved by the institutional IRB.

2.2. Measures

Self-reported participant characteristics included age range, gender, and cancer site. The 8-item eHealth Literacy Scale (eHeals) [8] was used to evaluate eHealth literacy. This measure offers eight statements to which participants respond on a five-point scale (1 = strongly

disagree, 5 = strongly agree). Item responses are then summed to derive an overall eHealth literacy score. Two exploratory questions provided by the authors of the eHeals [8] and questions assessing current use of multiple technological platforms were included to evaluate participants' use of HIT. Participants were also asked about willingness to communicate with their care team using home-based HIT.

2.3. Data Analysis

Means and frequencies were used to characterize participant characteristics, eHealth Literacy, and use of HIT. Age group differences in eHealth literacy and use of HIT were evaluated using chi-square tests, Fisher's tests, and independent sample *t*-tests. Cohen's *d* values were used to characterize the magnitude of age group differences. Statistical analyses were conducted in SAS 9.4 (Cary, NC).

3. Results

3.1. Participant Characteristics

Participant characteristics are presented in Table 1. Of the 198 participants who responded, 51% (*n* = 101) were age 65 or older, and 32% (*n* = 63) were between the ages of 55 and 64. There were slightly more male (53%) than female participants, particularly among older participants (i.e., aged 65 and older) (59%). The most common cancer diagnoses were of the head or neck (19%), breast (16%), genitourinary system (16%) and lung (14%).

3.2. eHealth Literacy

Results of the eHeals measure are presented in Supplemental Table 1. As hypothesized, the eHeals average was significantly higher in younger participants (Mean = 3.78, SD = 0.86) than older participants (Mean = 3.44, SD = 0.91) ($p < .01$, Cohen's *d* = 0.38). Compared to younger participants, older participants were less likely to feel confident in having the skills needed to evaluate health resources on the Internet ($p < .01$, *d* = 0.39), or knowing how to use the health information found on the Internet to help them ($p < .01$, *d* = 0.44) or answer health questions ($p = .01$, *d* = 0.35). Only one-third of older participants felt confident using information from the Internet to make health decisions, compared to one-half of younger participants ($p < .01$, *d* = 0.45).

3.3. Use of Health Information Technology

Exploratory questions from the eHeals revealed that compared to younger participants, older participants were significantly less likely to find the Internet useful in making health decisions ($p = .02$, *d* = 0.33). Similarly, older participants felt it was less important for them to be able to access internet-based health resources than younger participants, but this difference was not statistically significant ($p = .11$).

Results of the questions on HIT use are presented in Supplemental Table 2. Over 90% of participants had internet access at home and used the internet at home multiple times each day. There were no age group differences in the number of participants with internet access at home.

Over 90% of participants had an e-mail address, and more than three-quarters of participants checked their e-mail at least once per day. Compared to younger participants, older participants were significantly less likely to have an e-mail address ($p = .04$).

The majority of participants owned a smartphone, though older participants were significantly less likely to own a smartphone ($p < .01$). Over half of participants owned a tablet, with most owning an Apple iPad. There were no age group differences in the likelihood of owning a tablet. Few participants used an activity tracker, regardless of age. Nearly all older participants reported using their activity tracker each day, compared to half of younger participants. Three-quarters of participants used the online patient portal, though older participants were significantly less likely than younger participants to use the patient portal ($p = .03$). Most participants agreed that the portal was easy to use, regardless of whether they used it or not. A third of participants owned a virtual assistant (e.g., iPhone Siri or Amazon Alexa). Among participants who did not already own a virtual assistant, only 10/115 participants expressed any interest in learning more about using one. There were no age group differences in the likelihood of owning a virtual assistant or interest in learning more about using a virtual assistant.

Half of all participants agreed that they were interested in using technology to communicate with their care team from home, while another third was neutral. Across groups, participants were most interested in using a computer or smartphone to communicate with their care team. Few participants had used a tablet in-clinic to rate their symptoms, and older participants were significantly less likely to have used an in-clinic tablet than younger participants ($p < .0001$). Among participants who had used an in-clinic tablet, nearly all felt the tablets were easy to use.

4. Discussion

4.1. Principal Findings

HIT is increasingly incorporated into oncology care, but little is known about eHealth literacy or use of currently implemented HIT platforms among older adult patients with cancer. Our results suggest that older adult patients with cancer report significantly lower eHealth literacy than younger adult patients with cancer. Further, older adults felt less confident than younger adults in their ability to find and evaluate health resources on the internet, perhaps due to younger adults exhibiting more zeal/familiarity with navigating the internet. In addition, compared to younger adults, older adults were significantly less likely to find the internet helpful in making health decisions. Thus, some of this age difference may be explained by a lack of motivation to investigate resources that are already deemed to be of limited utility by older adult patients. Regardless of age, most patients were not opposed to using HIT from home to communicate with their oncology care team. Perhaps surprisingly, nearly all older adults reported daily use of activity trackers, compared to approximately half of younger adults. While overall rates of activity tracker use in our study sample were low, this finding suggests that activity trackers may serve as a useful means of engaging older adult patients with eHealth technology. Taken together, these results suggest that in spite of lower eHealth literacy, older adults with cancer are amenable to using home-based HIT, and future studies should consider implementing HIT in older adults.

4.2. Limitations

Limitations of this study include a predominantly white, English-speaking sample that limits the generalizability of results to patients with cancer from under-represented racial backgrounds or non-English speaking patients. Similarly, our sample consisted of patients receiving radiation treatment, thus generalizability of results to patients receiving other therapies in the absence of radiation therapy (e.g., chemotherapy) may be limited. The anonymous survey format also restricted our ability to identify sociodemographic characteristics that may influence eHealth literacy, HIT use, and/or survey response rate.

4.3. Conclusions

Previous studies have shown that there are many advantages of HIT, including quality improvement, cost savings, increased patient engagement, and improved health outcomes [4,9,10]. Results from this study are among the first to indicate that older adults with cancer (aged 65+ years) have significantly lower eHealth literacy and less confidence in their ability to find and evaluate health resources on the internet than younger adult patients (aged <65 years), but maintain an openness to using HIT connect with their care team. These findings contribute to the current body of literature on HIT use and warrant additional research into potential benefits of HIT in older adults with cancer.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Participant characteristics, %.

Characteristic	Patients aged < 65 (n = 97)	Patients aged 65+ (n = 101)
Age range		
18–39	8	–
40–54	27	–
55–64	65	–
65–74	–	59
75–84	–	31
85+	–	10
Female	54	41
Cancer diagnosis		
Breast	24	8
Gastrointestinal	7	13
Genitourinary	9	23
Gynecologic	5	7
Head and Neck	21	17
Hematologic	10	5
Lung	11	17
Melanoma	4	1
Other	10	9

Note: Cancer diagnoses reported for patients with only one diagnosis.