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Mobility Device Use and Mobility Disability in US Medicare Beneficiaries with and without Cancer History

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Abstract

Objectives—To examine prevalence of mobility device use in US community-dwelling older adults, including older adults with cancer history ('survivors'), and to estimate mobility disability noting variation by cancer history, cancer site and other factors to improve early detection of mobility limitations.

Design—Cross-sectional analysis from the 2011 National Health and Aging Trends Study

Setting—In-person interviews in the homes of study participants.

Participants—Nationally representative sample of community-dwelling Medicare beneficiaries, ages 65+ (n=6,080, including 1,203 survivors).

Measurements—Participants were asked about: cancer history, pain that limited activity, mobility device use (e.g., canes, walkers, wheelchairs and scooters), history of falls and medical conditions plus assessed for approximate mobility disability using a 3-Meter gait speed test. The results were scored on a scale of 0–4 (0=lowest, 4=highest) using criteria from the National Institute on Aging.

Results—Nineteen percent of older adults and 23% of survivors reported using ≥1 mobility device, most commonly a single-point cane. Approximately 10% of breast, 6% of prostate, and 3% of colorectal cancer survivors reported using ≥2 devices in the past month. Survivors had lower mean gait speed scores (2.27) than adults without cancer history (2.39). In regression models, survivors were 18% less likely than adults without cancer history to score high on the gait speed test (OR=0.82, p<.05). Prior mobility device use, history of multiple falls, unhealthy weight, Black

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AUTHOR CONTRIBUTIONS

SMB led the conceptualization, design, analysis, and writing of this manuscript. EF assisted with analysis and data management for the study. GC, EF and HDK assisted in interpreting data and writing the manuscript. HDK provided critical clinical expertise in geriatrics and geriatric oncology.

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race, multimorbidity and pain that limited activity were associated with lower gait speed scores in all participants (all p<.05).

Conclusions—A greater proportion of older survivors used mobility devices than adults without cancer history. Mobility device use varied by cancer site and was highest in breast, colorectal and gynecologic cancer survivors. Survivors were also more likely to show signs of mobility disability, based on gait speed, compared to adults without cancer history. These indications, though modest, suggest that older survivors may require special attention to functional changes in survivorship.

Keywords

Cancer survivors; mobility device; gait; physical performance; NHATS

INTRODUCTION

More than 6 million adults in the United States use mobility devices and approximately two-thirds of these users are adults older than 65 years[1]. Concurrently, the aging of the US population has increased the cancer burden for older adults. In 2016, 62% of cancer survivors were 65 years or older and roughly one-third also experienced comorbidities which may impede cancer recovery [2]. Common side effects of cancer treatment (e.g., pain, neuropathy, bone loss) along with age-related conditions (e.g., sarcopenia, arthritis), may hinder mobility, activities of daily living and quality of life [3]. Despite these established challenges, the precise proportion of older cancer survivors that have mobility limitations and may benefit from mobility devices to facilitate daily function is unknown [4, 5]. Further, there is a paucity of data currently available on prevalence of mobility device use and mobility disability risk factors specifically among older cancer survivors, a high-risk population, to inform clinical application [6, 7].

Physical performance assessment is increasingly recognized as an evidence-based way to determine overall functional status and to disentangle functional aging from chronological aging [8–10]. However, it is not routinely used in assessing older adults that have been diagnosed with cancer ('survivors')[11]. Some studies have shown that pre-diagnosis physical performance assessment may be predictive of subsequent disability in cancer survivors [12] and may also be a potent prognostic biomarker [13]. Gait speed assessment, in particular, offers a simple and efficient way to clinically assess potential mobility impairments as well as illness-related gait changes over time, including cardiovascular disease[14], cognitive impairment [15] and mortality trajectory[16]. Short walking tests, including the 3-meter gait test, have been demonstrated as valid and meaningful predictors of mobility disability in several longitudinal cohort studies in research with adults 65 years and older [17]. Assessing and monitoring gait speed provides a reliable way to detect changes in a timely, and precise manner during cancer recovery. Having a clearer understanding of both mobility device use and mobility disability risk factors among survivors (including survivors of different cancer sites) will provide essential data to inform interventions to reduce mobility impairments and optimize function in this vulnerable older adult population.

The goals of this study were to 1) describe the prevalence of mobility device use among older survivors compared to adults without cancer history; 2) compare mobility device use

and mobility disability (approximated through gait speed scores) by cancer site and; 3) assess the association of cancer history, sociodemographic and common health conditions on mobility disability in older adults. These data may provide a method for identification of increased risk of mobility disability in patients with cancer history and guide clinicians in supporting patients in cancer recovery.

METHODS

Data

Data from the 2011 National Health and Aging Trends Study (NHATS) were analyzed (http://www.nhats.org). The NHATS is funded by the U.S. National Institute on Aging to examine late life trends in disability and to advance understanding of functional changes in U.S adults who are Medicare beneficiaries, age 65 and older. The study protocol was implemented by investigators at Johns Hopkins University. All study participants provided written informed consent. This study utilized a multistage sampling design with oversampling of Black, non-Hispanic persons and the oldest-old (≥85 years). Data collection consisted of in-home standardized interviews. Special permission was obtained from the NHATS Data Confidentiality Committee to access sensitive information, including site of cancer diagnosis.

Study population

A nationally representative sample of community-dwelling adults age 65 and older (n=8245) was enrolled in the NHATS using the Medicare enrollment database as the sampling frame (71% survey response rate). Participants living in nursing homes that were not expected to return to their previous residence (5.7%) and those who did not complete the in-person interview (2%) were excluded from this analysis. Participants with proxy respondents, in circumstances of dementia, significant cognitive impairment, speech impairment, or severe illness (6.7%) were also excluded from the analysis. Owing to incomplete data on skin cancer subtype, skin cancer survivors (7.9%), were also excluded from the analysis. This resulted in a final analytic sample of 6,080 community-dwelling older adults (4,877 adults without cancer history and 1,203 survivors).

Measures

Participant Characteristics—Demographic variables from the baseline interview included age, gender, self-identified race/ethnicity and education. Age was further categorized into three categories (65–74, 75–84, 85+) and race/ethnicity was categorized into four groups (non-Hispanic white, non-Hispanic Black, Hispanic, and other). Education was categorized into five groups (<9 years, 9–11 years, high school graduate, some college/vocational school, and ≧ college degree). Participants were asked about their marital status and categories were created into two groups (ever married/never married).

Clinical Characteristics – Cancer Diagnosis, Medical Conditions—Participants were asked if they had been bothered by pain in the last month (Yes/No), a common concern among older adults[18]. Participants were also asked if they had ever been diagnosed with cancer and if so, which site (i.e., prostate, breast, cervical/ovarian/uterine, colorectal,

bladder, kidney, skin or other cancer). Participants were asked if, in the last month, they took any medicines prescribed by a doctor (Yes/No). Body mass index (BMI) was calculated from measured height and weight with obesity defined as BMI ≥ 30.0 kg/m^2. Participants were asked how many times they fell within the last 12 months. We categorized those with fewer than 2 falls as 'low fall risk' and 2 or more falls as 'high risk' or positive for history of multiple falls.

In addition to cancer, participants were asked (Yes/No) about occurrence of ten common age-related conditions (i.e., arthritis, heart disease, diabetes, osteoporosis, hip fracture, visual impairment, stroke, depression and dementia). We further categorized number of medical conditions with 0–2 conditions (low co-morbidity burden) and 3 or more conditions (i.e., high burden or multimorbidity).

Mobility Device Use—Participants were asked to report any mobility device use in the month prior to the baseline interview, including use of a cane, walker, wheelchair (manual, power, electric, or motorized), and/or scooter. Categories of device use were created based on number of devices used in the last month (0, 1, ≥2).

Gait Speed and Mobility Disability—Mobility disability was estimated using the gait speed test, which is one component of the Short Physical Performance Battery [19]. Similar walking tests have been demonstrated as valid predictors of mobility disability in multiple longitudinal cohorts studies in a variety of older adult populations [10,17]. The NHATS gait speed test is timed on a 3-meter course at a person's usual pace. Participants start from a standing position and time was marked when the last foot crossed over the 3-meter mark. Participants were allowed to attempt the 3-meter walk two times. The final score reflects the average of the two attempts or the score of one if only one attempt was completed. The scoring categories (range 0 to 4, 0=lowest, 4=highest) for the NHATS measures represent quartiles of the weighted distribution for non-missing, non-zero values. The approximate cut points in meters per second for NHATS gait speed categories were: 0=no attempt; 1=≤.579; 2=.580-.748; 3=.749-.904; 4=≥.905 [20]. It is estimated that approximately 5% of participants or less were not eligible to attempt the test for safety reasons or scored a 0 on the test [20]. As demonstrated by Freedman, et al. and others, individual physical performance items have reasonable test-retest reliability [21, 22].

Statistical Analysis

To understand the discrete differences between cancer survivors and adults without cancer history, we first analyzed demographic variables for adults without cancer history and survivors and for the total analytic sample. Differences in demographic characteristics, number of medical conditions, pain limitations, prescribed medications and gait speed scores were evaluated using the adjusted Wald statistic.

Prevalence of mobility device use among all adults was calculated and compared to survivors using weighted proportions. Prevalence of mobility device use was also estimated by cancer site. Differences in mobility device use by cancer history and cancer site were evaluated using the adjusted Wald statistic. Total mean and individual gait speed scores were estimated among adults without cancer history, cancer survivors and by cancer site.

Two multivariable logistic regression models were used to estimate the association of sociodemographic (e.g., gender, age, education and race/ethnicity,) and clinical characteristics (cancer history, medical conditions, pain that limited activity, history of falls and body mass index) with 1) mobility device use and also with 2) mobility disability, which we estimated using the gait speed score. For the second model, we categorized gait speed as binary variable, such that regression coefficients assessed likelihood of achieving the highest score on the gait speed test v. not. Prior history of mobility device use was included as a covariate in the model estimating mobility disability. Logistic regression coefficients were exponentiated and expressed as odds ratios (with 95% confidence intervals) for ease of interpretation. All data were analyzed using Stata SE v. 14 (Stata Corporation, College Station, TX). To account for non-response, oversampling, and incomplete interviews, analytic weights were applied.

Following completion of these analyses, we also stratified the two main models by cancer history to help identify any unique contribution of cancer history in older adults of the same age to mobility device use or gait speed, adjusting for covariates as before.

RESULTS

In our analytic sample of community-dwelling adults aged 65 and older in the United States, there were a total of 1,203 (20%) survivors and 4,877 (80%) adults without cancer history. A greater proportion of participants were female (57.2%) than male. Compared to adults without cancer history, survivors overall were older (mean age=75.4; CI: 75.0–75.9%, $p<0.05$) and mostly white (83.4%; CI: 80.7–85.8%, $p<0.05$). Prescription medication use (94.4%; CI: 92.4–95.9%) and limitations of activity due to pain (58.5%, CI: 53.7–63.2%) were also higher in cancer survivors (Table 1).

Among survivors, the most commonly diagnosed cancer site was prostate (n=344, 29%), followed by breast (n=314, 26.0%), colorectal (n=116, 9.6%), gynecologic (including cervical/ovarian/uterine cases) (n=109, 9%), bladder (n=50, 4%), kidney cancer (n=41, 3.4%), or other cancer diagnoses (n=229, 19%). Overall, the distribution of medical conditions was similar in adults with and without cancer history. Visual impairment was the most commonly reported condition overall (55.2%), followed by arthritis (52.6%), hip fracture (27.8%), depression (27%) and diabetes (23%). History of multiple falls was slightly higher in survivors (14%). The prevalence of arthritis, hip fractures and dementia were slighter higher in cancer survivors compared to adults without cancer history, but by and large, the health profile was comparable (Table 1).

Mobility Device Use

Prevalence of Mobility Device Use by Cancer Status and Cancer Site—Twenty percent (95% CI: 19–21.2%) of participants reported using any mobility device in the last month (Figure 1). Among mobility device users, 36.6% (7.35%; 95% CI: 6.67–8.08) reported using two or more devices in the last month. The most commonly reported mobility device was the single-point cane (15.3%; 95% CI: 14.4, 16.2) and the least commonly reported device was the scooter (2.1%; 95% CI: 1.7, 2.59).

Compared to adults without cancer history, mobility device use among survivors was higher (23.4%; 95% CI: 21.2, 25.8, p<0.05). Ten percent (95% CI: 7.37–13.8%, p<0.05) of breast cancer survivors reported the use of two or more mobility devices in the past month (Figure 2). Additionally, 5.7% of prostate cancer survivors (95% CI: 3.67, 8.7) and 3.4% of colorectal cancer survivors (95% CI: 1.67, 6.9) reported use of two or more mobility devices in the past month.

Associations with Sociodemographic Characteristics—Older age was a significant negative correlate for mobility device use; adults 75–84 were twice as likely (OR=2.25, 95% CI 1.81–2.79, p<.001) and adults older than 85 years were nine times as likely (OR=9.4, 95% CI 6.71–13.2, p<.001) to use any mobility device, compared to adults 65–74 years. Non-Hispanic Black participants were also twice as likely (OR=2.13, 95% CI 1.72–2.64, p<.001) to use a mobility device compared to non-Hispanic white participants (Table 2).

Associations with Clinical Characteristics—Individuals with three or more medical conditions were more than twice as likely as individuals with two or fewer conditions to use a mobility device (OR=2.13, 95% CI 1.71–2.67, p<.001). Adults with a BMI greater than 30 (i.e., obese) were also twice as likely (OR=2.08, 95% CI 1.59–2.71, p<.001) to report using any mobility device (Table 2). Adults that were positive for history of falls were three times more likely than those at low risk of falls to use any mobility device (OR=2.97, 95% CI 2.4, 3.68, p<.001). Additionally, adults that reported that pain limited their activities were nearly three times as likely as those who did not report that pain limited activities to use any mobility device (OR=2.67, 95% CI 2.4–3.68, p<.001).

In regression models, survivors were more likely than adults without cancer history to use any mobility device, but this was not statistically significant (Table 2).

In stratified analysis, we noted that survivors were mostly similar to adults without cancer history for factors associated with mobility device use considering covariates, except in cases of education, race and history of multiple falls (see Supplementary T1).

Mobility Disability Estimates Based on Gait Speed Scores

Survivors exhibited lower mean gait speed score than adults without cancer history. The mean score for all survivors was 2.27 (95% CI 2.18–2.35), compared to 2.39 (95% CI 2.34–2.45) in adults without cancer history. Prostate cancer survivors had the highest mean gait speed score of 2.52 (95% CI 2.38–2.67). Breast cancer survivors had the lowest mean gait speed score of all cancer sites at 2.19 (95% CI 2.03–2.35) (Table 1).

Associations with Sociodemographic Characteristics—On the gait speed test, we noted an age-related decline in speed, such that adults 75–84 years were more than 50% less likely (OR=0.5, 95% CI 0.43–0.59, p<.001) and adults 85 years and older were about 70% less likely (OR=0.31, 95% CI 0.25–0.39, p<.001) to achieve the fastest gait speed score compared to adults 65–74 years (Table 3). Female participants were significantly less likely than male participants to perform well on the gait speed test (OR=0.75, 95% CI 0.65–0.87, p<.001). Non-Hispanic Black participants were about 60% less likely to perform well on the

gait speed test compared to non-Hispanic white adults (OR=0.42, 95% CI 0.33–0.53, p<0.001).

Associations with Clinical Characteristics—From our regression model, we observed that survivors were 18% less likely to score high (i.e., a 4) on the gait speed test compared to all adults without cancer history (OR=0.82, 95% CI 0.64–0.93, p<.05), controlling for covariates (Table 3). Participants that reported history of mobility device use were more than 83% less likely to achieve the fastest score on the gait speed test than non-users of mobility devices (OR=0.17, 95% CI 14–20, p<.001) (Table 3). Adults who were underweight (<.18.5 BMI) were half as likely (OR=0.53, 95% CI 0.32–0.89, p<.05) to achieve the highest score compared to adults with a healthy weight. Both chronic disease burden and pain that limited activities were associated with lower scores on the gait speed test. Adults with 3 or more medical conditions were half as likely as adults with two or fewer conditions to perform well on the test (OR=0.63, 95% CI 0.52–0.75, p<.001). Similarly, adults that reported pain that limited activities were nearly half as likely as adults without pain that limited activity to perform well on the test (OR=0.71, 95% CI 0.58–0.89, p<.001).

Although cancer history overall (using aggregated estimates of survivors) was a significant correlate for mobility disability in our regression model, we did not observe significant differences on gait speed performance when we compared this data by specific cancer sites in adjusted models.

In stratified analysis, we noted that being underweight had a strong, significant negative correlation with gait speed for cancer survivors, controlling for all other covariates (Supplementary T2). Survivors who had a BMI <18.5 were 67% less likely (OR=0.33, 95%CI 0.16–0.7, p<.001) than survivors with a healthy weight to achieve the highest score on the gait speed test.

DISCUSSION

More survivors reported using at least one mobility device compared to adults without cancer history. Similarly, survivors were less likely to score high on the gait speed test, suggesting that survivors may present with greater mobility disability compared to other adults. Further, while the relationship between cancer history and mobility device use was attenuated by adjustment for age, the relationship between cancer history and lower gait speed score persisted even after controlling for age. Consistent with other studies, greater levels of multimorbidity, history of multiple falls and older age (i.e., 85+ years) appeared to exacerbate mobility limitations in this older adult population, especially for survivors [23,24]. We observed a recurring, yet nuanced influence, of cancer history on mobility measures for these older participants that could be clinically meaningful and has not been fully described. Aging and aging with cancer may require unique consideration in designing an individualized care plan.

Our study extends the current literature by providing national benchmarks to understand extent of mobility device use among US older adults, especially older survivors, an understudied population. To our knowledge, we are also the first to provide prevalence

estimates of specific mobility devices used by older cancer survivors delineated by cancer site. Additionally, we used a clinically valid objective measure (i.e., 3-meter gait speed test) shown to be predictive of mobility disability in other studies to characterize the experience of older survivors. These objective tests are easily performed in clinical settings, require little training and no specialized equipment, and thus are feasible to use in a clinical, outpatient or community setting. As pain that interfered with activity was reported by more than half of participants, appropriate pain management may assist in improving physical function and potentially in reducing reliance on mobility devices. Physical activity programs for older adults and survivors to improve movement and function may be especially important to support this goal [25,26] Interventions that target healthy weight management, especially in breast cancer survivors, may have particular benefit as they had the greatest difficulty with the gait speed test compared to other survivors. Comparing physical performance test results with other frailty indicators may also be helpful in making recommendations for patients with mobility challenges. For survivors with impairments such as neuropathy and decreased balance, rehabilitation interventions (e.g., physical or occupational therapy) may also be beneficial.[27] Physical therapy is chronically under-prescribed for survivors and other individuals who could greatly benefit. Several key papers report persistent mobility problems among community-dwelling cancer survivors who are not in active treatment and do not receive assessment of functional problems nor a referral to rehabilitation.[5, 28,29]

Given the wide variability of functional status in older adults in the US, it is not surprising that one-fifth of community-dwelling older adults rely on mobility devices to live their lives. It is also not surprising that almost one-quarter of older survivors said they rely on at least one mobility device to function. However, while understanding the extent of mobility device use in the US older adult and cancer survivor population is essential, quantifying use of mobility devices does not provide the full context for why an older adult may use a device, how they chose their device(s) and upon whose recommendation (i.e., a provider, a family member or on one's own). Further, it does not indicate whether this is selected for temporary use or as part of a therapeutic effort (e.g., a rehabilitation program) to restore a higher level of function. These are all questions that warrant further exploration.

Our study was strong in several ways. First, we used a large sample of robust, nationally representative data to explore and characterize a growing population of US adults that are significantly changing the US healthcare landscape. We also believe we have contributed valuable information on older cancer survivors, a vastly heterogeneous population, for which there is little data on which to base critical clinical interventions. Recognizing that breast, prostate and colorectal cancer survivors reported greater use of multiple mobility devices provides a basis on which to prioritize mobility interventions for these groups. Additionally, understanding that Black older adults may be at higher risk of mobility disability presents an opportunity to engage this community in preventive and supportive care.

We faced some limitations in our study. As a dataset administered by the National Institute on Aging, we benefited from many rigorous age-related measures. However, NHATS does not include a few key variables that would be relevant for a cancer population, such as time since cancer diagnosis, stage at diagnosis, time since completion of cancer treatment and

type of cancer treatment received. The sensitive files associated with the dataset includes records of cancer diagnoses, but lung cancer and subtypes of skin cancer were not available. The fact that we did not find significant differences in gait speed test scores by cancer site in our regression model may be party explained by our limited representation of cancer sites. Lung cancer survivors, for example, are known to have greater multimorbidity than survivors of other cancer sites[26], so would likely have had lower gait speed scores had they been included in the study. The NHATS interview asked whether the participant had arthritis, but did ask about severity or specific areas of the body affected. We analyzed as a cross-sectional study, which does not provide an opportunity to view events prospectively. Future investigations would benefit from including these additional cancer variables and using a longitudinal and/or experimental design.

Like most adults later in life, aging for cancer survivors often occurs on a spectrum. Tools such as the gait speed test and broader geriatric assessment [30, 31] provide important opportunities to identify mobility disability risk and tailor interventions to mitigate deficits and fortify the health and quality of life of all older adults, including cancer survivors.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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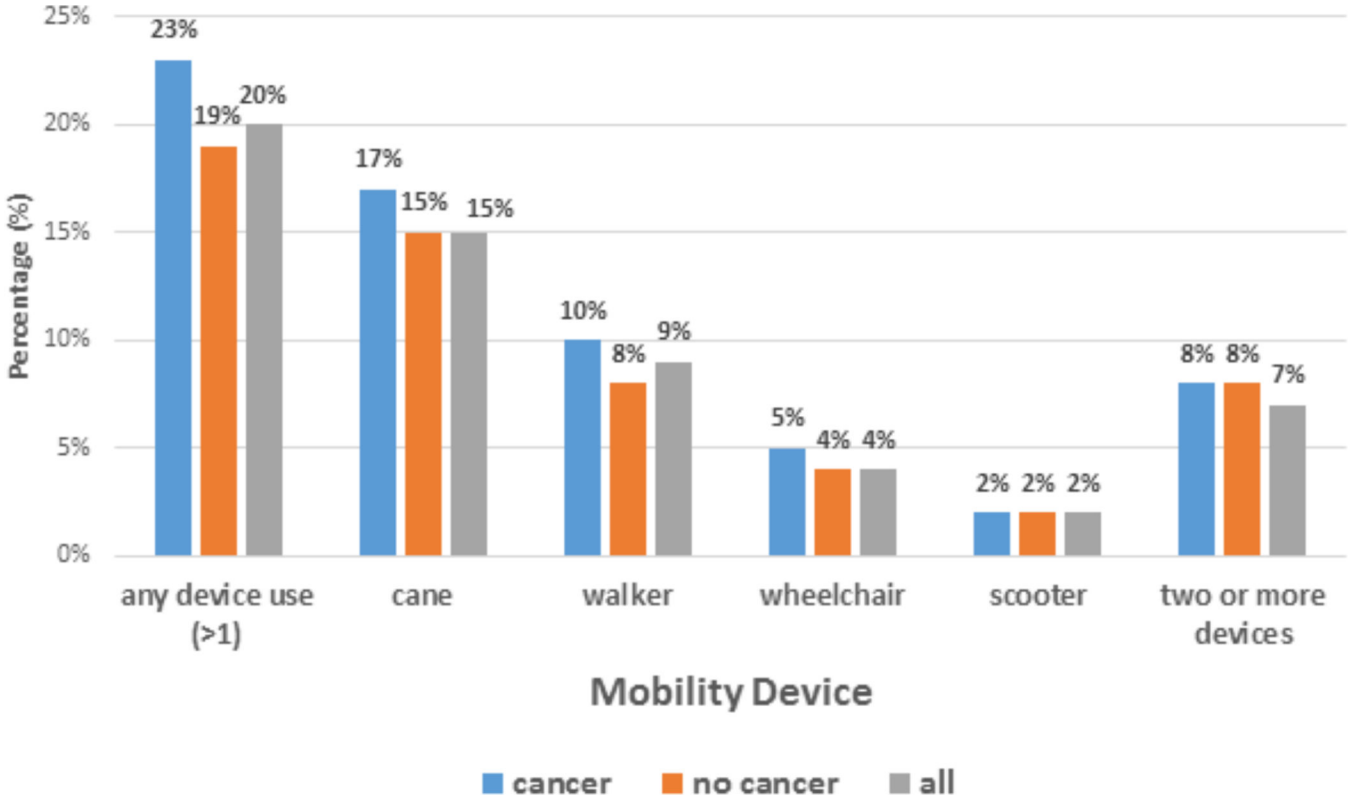

Figure 1.

Prevalence of Mobility Device Use in Older Adults by Cancer History (Cancer History v. No Cancer History) (n≈6080)

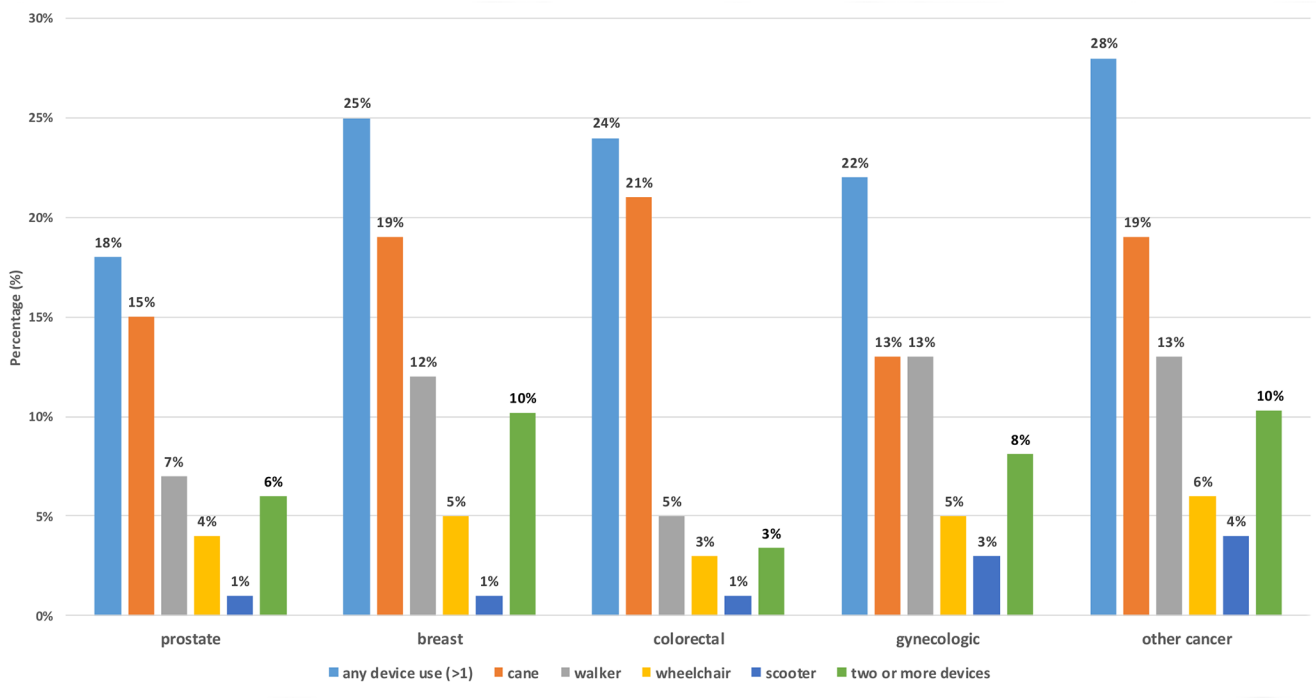

Figure 2.
Mobility Device Use among Cancer Survivors by Cancer Site (n≈1203)

Table 1.

Characteristics of Participants by Cancer History

Variables	No Cancer History (n=4,877)	Cancer survivors (n=1,203)	Total (n=6,080)
Age (Years)			
Overall Mean [95% CI]; SE	74.2 [74.0,74.4], 0.10 *	75.4 [75.0,75.9], 0.23 *	74.4 [74.2,74.6], 0.09 *
65–74	58.6 [57.2,60.0] *	50.0 [46.5,53.5] *	57.1 [55.9,58.3] *
75–84	32.1 [30.9,33.4] *	38.9 [35.7,42.1] *	33.3 [32.3,34.4] *
85+	9.3 [8.56,10.06] *	11.2 [9.72,12.76] *	9.62 [8.94,10.34]
Gender Proportion, [95% CI]			
Female	57.4 [55.9,59.0]	55.9 [52.9,58.9]	57.2 [55.6,58.7]
Race/ethnicity Proportion, [95% CI]			
Non-Hispanic White	79.5 [77.5,81.5] *	83.4 [80.7,85.8] *	80.2 [78.3,82.0] *
Non-Hispanic Black	8.98 [8.07,9.99] *	8.99 [7.52,10.7] *	8.98 [8.1,9.96] *
Hispanic	8.08 [6.86,9.49] *	4.5 [3.17,6.37] *	7.44 [6.38,8.66] *
Other	3.4 [2.49,4.63] *	3.07 [2.12,4.43] *	3.34 [2.54,4.39] *
Education Proportion, [95% CI]			
< 9 years	9.99 [8.8,11.3]	8.41 [6.74,10.4]	9.71 [8.57,11]
9–11 years	12 [10.9,13.2]	10.7 [8.91,12.9]	11.8 [10.8,12.9]
High school graduate	27.8 [26.3,29.3]	27.7 [24.8,30.7]	27.7 [26.3,29.2]
Some college/vocational school	26.1 [24.6,27.5]	28.7 [26,31.6]	26.5 [25.2,27.9]
≥ College degree	24.2 [22.1,26.4]	24.5 [21.3,28]	24.2 [22.1,26.5]
Marital status Proportion, [95% CI]			
Ever married	93.9 [92.9,94.7]	94.2 [92.2,95.7]	93.9 [93,94.8]
Body Mass Index kg/m^2 (mean, [95% CI])	27.8 [27.6,28.0]; 0.11	27.7[27.4,28.0]; 0.14	27.8 [27.6,28.0]; 0.09
Body Mass Index, Proportion by category, [95% CI]			
<18.5	1.74 [1.45,2.1]	2.35 [1.6,3.43]	1.85 [1.55,2.22]
18.5–24.9	31.1 [29.6,32.6]	30.9 [28.2,33.8]	31.1 [29.6,32.5]
25–29	38 [36.5,39.5]	39.1 [36.3,42.1]	38.2 [36.8,39.6]
≥ 30	29.2 [27.6,30.9]	27.6 [25.3,30]	28.9 [27.4,30.4]
Medical Conditions (excl cancer), (Proportion, [95% CI])			
Arthritis	51.9 [50.3,53.6]	55.4 [52.2,58.6]	52.6 [51.1,54]
Osteoporosis	19.9 [18.6,21.2]	21.7 [19.2,24.4]	20.2 [19.1,21.4]
Hip Fracture	27.4 [25.7,29.2]	29.7 [25.6,34]	27.8 [26.3,29.4]
Heart Disease	16.2 [15.1,17.3]	16.6 [14.4,19]	16.3 [15.3,17.2]

Variables	No Cancer History (n=4,877)	Cancer survivors (n=1,203)	Total (n=6,080)
Diabetes Mellitus	23.2 [21.9,24.6]	23.7 [21,26.7]	23.3 [22,24.7]
Stroke	8.61 [7.85,9.44]	9.1 [7.48,11]	8.7 [7.92,9.54]
Dementia	1.96 [1.67,2.29]	2.52 [1.63,3.88]	2.06 [1.75,2.41]
Visual Impairment	55.1 [53.4,56.7]	56 [52.4,59.6]	55.2 [53.9,56.5]
Depression	26.6 [25.2,28.1]	28.7 [26.2,31.3]	27 [25.7,28.3]
Number of Medical Conditions			
Overall Mean [95% CI]; SE	2.21 [2.17,2.26]; 0.023	2.33 [2.21,2.44]; 0.057	2.24 [2.19,2.28]; 0.021
0–2 (proportion low comorbidity burden, [95% CI])	52.64 [50.8,54.48]	48.6 [44.86,52.36]	51.9 [50.36,53.44]
3 or more (high burden/multimorbidity), [95% CI])	47.36 [45.52,49.2]	51.4 [47.64,55.14]	48.1 [46.56,49.64]
Bothered by Pain Proportion, [95% CI]			
Yes	50.7 [49.2,52.2] *	55.5 [52.3,58.5] *	51.5 [50.1,52.9] *
Pain ever limits activity Proportion, [95% CI]			
Yes	53.7 [51.3,56.1]	58.5 [53.7,63.2]	54.6 [52.5,56.7]
History of Multiple Falls Proportion, [95% CI]	11.67 [10.7, 12.73]	14.06 [11.96, 16.47]	12.1 [11.19, 13.07]
Takes prescribed meds Proportion, [95% CI]			
Yes	90 [87.8,90.1] *	94.4 [92.4,95.9] *	90 [89,90.9] *
3-meter gait speed score (0–4, 0=lowest;4=highest) Overall Mean [95% CI]; SE	2.39 [2.34,2.45], 0.027	2.27 [2.18,2.35], 0.043	2.37 [2.32,2.42], 0.025
3-meter gait speed score by cancer site (Mean [95% CI]); SE			
Breast Cancer	--	2.19 [2.03, 2.35], 0.08	--
Prostate	--	2.52 [2.38, 2.67], 0.07	--
Colorectal	--	2.26 [1.97, 2.55], 0.14	--
Gynecologic	--	2.26 [2.01, 2.51], 0.12	--

* $p<0.05$

CI=Confidence Interval

SE=standard error

Table 2.

Logistic Regression Results: Association of Any Mobility Device use by Cancer History, Sociodemographic and Clinical Characteristics

Variable	Mobility Device Use		
	Odds Ratio	95% Confidence Interval	p-value
Cancer History			
No	1.00 (ref)		
Yes	1.23	.96, 1.57	0.10
Age			
65–74	1.00 (ref)		
75–84	2.25	1.81, 2.79	<.001*
85+	9.40	6.71, 13.19	<.001*
Gender			
Male	1.00 (ref)		
Female	1.15	.94, 1.40	0.16
Race/Ethnicity			
Non-Hispanic White	1.00 (ref)		
Non-Hispanic Black	2.13	1.72, 2.64	<.001*
Hispanic	1.20	.67, 2.17	0.54
Other	.96	.64, 1.44	0.84
Education			
<High school	1.00 (ref)		
High school	.82	.58, 1.16	0.26
Some college	.67	.48,.92	<.02*
≥College grad	.72	.52,.99	<.04*
Body Mass Index kg/m^2			
18.5–24.9	1.00 (ref)		
<18.5	1.26	.60, 2.64	0.53
25–29	1.21	.93,1.57	0.15
≥ 30	2.08	1.59, 2.71	<.001*
Number of Medical conditions			
<2	1.00 (ref)		
3+	2.13	1.71, 2.67	<.001*
Activity Limited by Pain			
No	1.00 (ref)		
Yes	2.67	2.20, 3.23	<.001*
History of Multiple Falls			
<2 falls in last12 months	1.00 (ref)		

Variable	Mobility Device Use		
	Odds Ratio	95% Confidence Interval	p-value
2+ falls in last 12 months	2.97	2.4, 3.68	<.001 *

* p<0.05

Ref=reference category

Table 3.

Logistic Regression Results: Association of Gait Speed Score by Cancer History, Sociodemographic variables and Clinical Risk Factors

Characteristic	Gait Speed (likelihood of achieving highest score)		
	Odds Ratios	95% Confidence Interval	p-value
Cancer History			
No	1.00 (ref)		
Yes	0.82	0.67,1.00	<.05*
Age (in years)			
65–74	1.00 (ref)		
75–84	0.5	0.43, 0.59	<.001*
85+	0.31	0.25, 0.39	<.001*
Gender			
Male	1.00 (ref)		
Female	0.75	0.65, 0.87	<.001*
Ethnicity			
Non-Hispanic White	1.00 (ref)		
Non-Hispanic Black	0.42	0.33, 0.53	<.001*
Hispanic	0.68	0.32, 1.47	0.325
Other	0.48	0.3, 0.75	<.002*
Education			
<High school	1.00 (ref)		
High school	1.2	0.84,1.72	0.3
Some college	1.59	1.22, 2.07	<.001*
≥College grad	2.66	1.91, 3.71	<.001*
Body Mass Index kg/m^2			
18.5–24.9	1.00 (ref)		
<18.5	0.53	0.32, 0.89	<.02*
25–29	1.04	0.82, 1.32	0.77
≥ 30	0.85	0.68, 1.05	0.14
Number of Medical conditions			
<2	1.00 (ref)		
3+	0.63	0.52,0.75	<.001*
Activity Limited by Pain			
No	1.00 (ref)		
Yes	0.71	0.58, 0.89	<.002*
Mobility Device Use			
No	1.00 (ref)		

Characteristic	**Gait Speed (likelihood of achieving highest score)**		
	Odds Ratios	**95% Confidence Interval**	**p-value**
Yes	0.17	0.14, 0.2	<.001 *
History of Multiple Falls			
<2 falls in last12 months	1.00 (ref)		
2+ falls in last 12 months	0.67	0.57,0.83	<.001 *

* p<0.05

Ref=reference category