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Assistive Technology Use of Older American Indians in a Southeastern Tribe: The Native Elder Care Study

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Abstract

The objectives of this study were to examine the prevalence of assistive technology (AT) use, type of assistance used for each activity of daily living (ADL) limitation, and correlates of AT use among Native Indian aged 55 and older. Data were collected as part of a cross-sectional study of disability with 505 members of a federally recognized tribe using in-person interviewer administered surveys. Participants who reported difficulty with ADLs, including bathing, dressing, eating, transferring, walking, toileting, grooming, and getting outside, were asked about AT use. Other measures were demographics, living arrangements, receipt of personal care, Medicare and Medicaid beneficiary status, number of chronic conditions, lower body function, and personal mastery. Results indicated that 22.3% of participants aged 55 and older and 26.0% aged 65 and older reported AT use. Toileting had the largest percentage of participants who relied on AT only and getting outside had the largest percentage of participants relying on a combination of AT and personal care. Multiple variable logistic regression analysis identified receipt of personal care, having more chronic conditions, and poorer lower body function as significantly associated with higher odds of AT use. The results suggest that there is greater AT use in this sample than in same-aged adults in national samples. This greater use may be reflective of a combination of higher disability rates, cultural factors, and greater access to AT. Clinicians can use this information to identify the activities with which their patients are experiencing the most difficulty and which ones can be addressed with AT versus personal care.

Keywords

assistive technology; American Indians; disability

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An assistive technology (AT) device is “any item, piece of equipment, or product system ... used to increase, maintain, or improve functional capabilities of individuals with disabilities.”¹ Examples of AT devices include a cane, a walker, a wheelchair, and a raised toilet seat. AT use is common in older adulthood, and an examination of national data indicated that there was an increase in the independent use of AT from 1992 to 2001.² According to data from six national surveys, 14% to 18% of community-dwelling persons aged 65 and older use AT.³

Many factors have been examined as determinants of AT use in older adults, including demographics, economic and social resources, and health. With respect to demographics, evidence suggests that older age is positively associated with AT use.^{4–6} The data on sex are less clear; some studies have found no differences in AT use by sex,⁴ while others have identified men^{5,6} or women⁷ as more likely to use AT. Research examining race differences in AT use has also generated mixed results, with some studies showing that nonwhites are less likely to use AT^{8,9} and others showing that nonwhites are more likely to use AT.^{6,10} Higher educational attainment is positively associated with AT use,^{4–6} although the bulk of evidence indicates no relationship between economic status and propensity to use AT.^{4–6} In terms of social resources, not being married^{4,5} and living alone⁶ increase the likelihood of AT use. Finally, poorer health, measured by the presence of chronic conditions and disability severity, is associated with AT use.^{4–6} Altogether, these studies suggest that demographics play a minimal role, economic and social resources play a somewhat greater role, and health tends to play the strongest role in estimating AT use.

American Indians experience some of the highest rates of disability of any race or ethnic group.^{11–13} Understanding AT use among older American Indians is important, because it can facilitate functional independence. There are no published studies that have examined AT use among older American Indians. The purpose of this study was to determine prevalence of AT use, type of assistance used for each activity of daily living (ADL) limitation, and correlates of AT use in a sample of older American Indians.

METHODS

Setting

The participating tribe is a federally recognized tribe in a rural Southeast region of the United States with approximately 14,500 enrolled members. The tribe operates a hospital through a compact with Indian Health Services (IHS) where most of the tribal members receive their primary care. Other tribally run services include a home health agency, a nursing home, a senior center, and several privately owned durable medical equipment vendors.

Data Source

Data were collected as part of the Native Elder Care Study, a cross-sectional study of disability. Trained interviewers administered surveys between July 2006 and August 2008. Interviewers were identified through advertisements placed in the tribal newspaper and word of mouth. All hired interviewers received 8 hours of training, including human subject protection certification, survey administration, and safety. Interviewers were retrained every 3 months.

To be included in the study, participants had to be an enrolled tribal member, aged 55 and older, noninstitutionalized, cognitively intact, and reside in the tribe's service area. A lower age criterion was used, because the tribal leaders requested it because of their observations of growing rates of chronic disease and disability onset among those aged 50 to 59. In fact, one study found that American Indians spend more time with chronic health problems than

members of other racial and ethnic groups and that American Indians have higher rates of disability at younger ages than other racial and ethnic groups, leading the researchers to suggest that American Indians experience a faster pace of chronological aging.¹⁴

Per tribal enrollment records, there were 1,430 potentially eligible participants based on age and residential location. This list was randomized, and the names and contact information were distributed to interviewers. Equal numbers of respondents were sought for the age groups 55 to 64, 65 to 74, and 75 and older until a sample of 500 was obtained. An interviewer contacted these persons via a telephone call or a home visit. The in-person interviews lasted between 60 and 90 minutes. Proxy interviews were not conducted. Fifty of the 633 persons assessed were ineligible to participate. Of these 50 individuals, three lived outside the service area, 14 were in a nursing home, 14 did not pass the dementia screen, and 19 were deceased. Eighty-seven percent of the interviews were conducted in the participant's home and the rest in a tribal building. Seventy-eight persons refused to participate, yielding an 87% response rate and a final sample size of 505. Propensity to decline participation increased with age, although this was not significant, and men were more likely to decline than women (54% vs 46%, $P \leq .001$). The tribe's institutional review board, Tribal Council, and Elder Council approved the project. West Virginia University institutional review board approval was also obtained. All study participants received a \$20 gift card.

Theoretical Framework

An expanded version of the behavioral model¹⁵ guided the study. The behavioral model posits that societal factors, health system factors, and individual factors determine health services use.¹⁶ Individual factors include predisposing, enabling, and need factors.¹⁰ Predisposing factors are demographic characteristics, enabling factors facilitate obtaining and using services, and need factors are health conditions and functional ability. The expanded version accounted for psychosocial factors, which include attitudes, social norms, and perceived control.¹⁵

Measures

AT Use—Persons who reported a limitation in performing ADLs were asked if they use AT. Interviewers asked about difficulty performing ADLs, including bathing, dressing, eating, transferring, walking, toileting, grooming, and getting outside.¹⁷ The ADL item was worded "Because of a health or physical problem, how much difficulty do you have...?" Response options were none or no difficulty, some difficulty, a lot of difficulty, unable or cannot do, and do not do because of a health problem. If respondents indicated some difficulty, a lot of difficulty, unable or cannot do, or do not do because of a health problem, they were asked the follow-up questions, with a yes/no response option: "Do you receive help from another person?" and "Do you receive help from some type of accessibility feature or device?" For the item assessing receipt of help from some type of accessibility feature or device, examples specific to the ADL were provided. For instance, the follow-up item for bathing or showering included grab bar, rail, stool, seat, or chair. AT use was a binary indicator of whether a respondent used any AT device for any of the eight ADL items.

Independent Variables—Variables were classified as predisposing, enabling, need, or psychosocial factors, according to the theoretical framework. Predisposing factors included age, sex, and educational attainment. Educational attainment was measured using three categories (≤ 11 years, high school graduate or General Education Development, and some college or greater). Enabling factors included marital status, living arrangements, receipt of personal care, and Medicare and Medicaid beneficiary status. Marital status indicated

whether the respondent was married/had a life partner or other. Living arrangement was measured as living alone or with others. Receipt of personal care was assessed using the follow-up question, “Do you receive help from another person?” described above. Persons were considered Medicare beneficiaries if they responded “yes” to the item, “Are you covered by Medicare, which is a Social Security health insurance program for disabled persons, persons age 65 years or older, and persons with end-stage renal disease?” Persons were considered Medicaid beneficiaries if they responded “yes” to the item, “There is a national program called Medicaid—This is a card you receive in the mail every month and it is usually light blue in color—which pays for health care for persons in need. Do you now have a Medicaid card?”

Need factors included the number of self-reported chronic conditions diagnosed by a physician since the age of 55 from a list of 3218 and the score on the Short Physical Performance Battery (SPPB).¹⁹ The SPPB consists of three tasks: chair stands, 4-m walk, and balance test. Scores on the SPPB range from 0 to 12, with higher scores indicating better lower body function. The psychosocial factor was personal mastery, assessed according to a seven-item measure of generalized expectations about a person’s sense of control,²⁰ with response options on a 4-point Likert scale (strongly disagree, disagree somewhat, agree somewhat, and strongly agree). Two items are stated in the negative and were reverse coded. Personal mastery scores range from 7 to 28, with a higher summary score indicating greater personal mastery.

Analyses

Descriptive statistics were used to examine sample characteristics and type of assistance used. The prevalence estimation of AT use was calculated for the entire study population and for those aged 65 and older to permit comparison with other published data. The prevalence rates of AT use for those aged 55 and older and 65 and older were calculated with the total number of study participants in the specific age range as the denominator ($n = 505$, $n = 338$, respectively) and the number of persons who reported AT use as the numerator ($n = 127$, $n = 95$, respectively). Both prevalence rates were weighted using tribal enrollment data to account for the sampling stratification by age.

Logistic regression was used to estimate the unadjusted associations between the individual factors and AT use with significant odds ratios (ORs) and corresponding 95% confidence intervals (CIs) reported. Next, a multiple variable logistic regression model was fit to estimate the associations between the independent variables and AT use with adjusted ORs (AORs) and corresponding 95% CIs reported. The multiple variable regression model only included variables significantly associated with AT use at the bivariate level at the $P \leq .05$ level. Diagnostics were assessed for multicollinearity, and none was detected. For the sample characteristics and regression model, a complete case analysis was conducted with 202 of the 505 study participants. Income was not examined beyond descriptive analyses because of the high number of missing cases ($n = 138$). All analyses used SAS software package version 9.1 (SAS Institute, Inc., Cary, NC).

RESULTS

Table 1 shows the study sample characteristics among those who reported at least one ADL limitation. The mean age was 72.1 ± 10.5 . The sample was primarily female (68.8%), 45.1% had less than a high school diploma, 39.1% were married or with a life partner, 29.7% lived alone, 45.1% received personal care from another person (paid or unpaid), 77.2% were Medicare beneficiaries, and 28.2% were Medicaid beneficiaries. The mean number of chronic conditions was 7.3 ± 3.8 , the mean SPPB score was 5.8 ± 2.8 , and the mean personal mastery score was 16.4 ± 3.7 .

Results indicated that 22.3% of the entire sample of persons aged 55 and older and 26.0% of those aged 65 and older used AT. Table 2 presents the percentages and frequencies of assistance use by AT use only, personal care use only, both AT and personal care use, and neither for each of the ADL limitations. Of those who used AT only, toileting, walking, and getting outside were the most common ADL limitations. Of those who used personal care only, dressing, grooming, and eating limitations were the most common. Of those using both AT and personal care, getting outside, bathing, and toileting were the most common. Of those who reported using neither AT or personal care for their ADL limitations, the most common activity limitations were eating, transferring, and walking.

Table 3 presents the unadjusted ORs and 95% CIs for the factors that were significantly associated with AT use. Older age, higher educational attainment, not being married, receipt of personal care, being a Medicaid beneficiary, being a Medicare beneficiary, more chronic conditions, and poorer lower body function were significantly associated with higher odds of AT use. Sex, living alone, and personal mastery were not associated with AT use. Table 3 also reports the AORs and 95% CIs. Receipt of personal care (AOR = 7.17, 95% CI = 3.33–15.47), higher number of chronic conditions (AOR = 1.21, 95% CI = 1.08–1.35), and poorer lower body function as measured by the SPPB (AOR = 0.87, 95% CI = 0.76–0.99) were associated with higher odds of AT use.

DISCUSSION

In general, little is known about AT use among racial and ethnic minority elders. American Indians have been excluded from much of the gerontological research because of insufficient numbers in available data.²¹ These findings expand on the current literature by providing the first study of AT with older American Indians. According to these data, a larger percent of those aged 65 and older reported using AT than same-age national samples.³ This greater use may be reflective of a combination of higher disability rates, cultural factors, and greater access to AT in the study sample.

The higher AT use found in this sample is likely a result of high rates of ADL limitations, but could also be explained by cultural factors. Forty-two percent of the study sample had at least one ADL limitation compared to 30% from the 2005 Medicare Current Beneficiary Survey.²² Also, acceptability and adoption of AT occurs within a sociocultural context. Previous research has identified “harmony ethic”²³ and “passive forbearance”²⁴ as cultural phenomena in American Indians. These constructs are about the value of autonomy and not imposing one’s needs on others. It is possible that these cultural factors may increase reliance on AT so as not to be an imposition on others. The degree to which cultural factors influenced the findings and the extent to which AT use is acceptable among the study participants cannot be determined, although this is an important area for future investigation.

There are no data that would permit comparison of access to AT of American Indians with that of the general U.S. population. The greater AT use may be related to the fact that the participants are members of a federally recognized tribe, which creates additional sources of access. Similar to other U.S. citizens, American Indians are eligible to participate in Medicare and Medicaid, although they participate at lower rates.²⁵ Tribal members primarily finance AT through Medicare, followed by Medicaid, and then private insurance or out of pocket. According to a hospital social worker, those without resources can borrow equipment from the tribal hospital, and sometimes the tribal senior center will cover the costs (personal communication, August 4, 2009). Currently, there is no line item funding for long-term care in the IHS budget. Tribes could use IHS funding to develop long-term care services as long as they were medical in nature, but doing so could take resources away from other health needs in the community. The IHS will pay for most AT devices that Medicare

covers through hospitals, clinics, or Contract Health Services, but these are budget dependent.^{25,26}

As with other research, the findings show that AT use varies by activity.²⁷ The data suggest that participants relied solely on AT for activities that exclusively or primarily involved the lower extremities, such as walking, toileting, and getting outside. For activities that exclusively or primarily involved the upper extremities, such as eating and grooming, participants generally relied on personal care only. For activities that often involved a combination of upper and lower extremities, such as bathing and transferring, participants tended to rely on both AT and personal care assistance. These patterns are similar to what was found in the National Health and Nutrition Examination Survey data.²⁸

In the adjusted regression model, enabling and need factors were the strongest determinants of AT use with no significant associations between the predisposing factors and AT use detected. Similar to previous research, receipt of personal care, more chronic conditions, and poorer lower body function were associated with higher odds of AT use. Unlike prior research, Medicare or Medicaid status was not significantly associated with AT use in the full model, although the unadjusted analysis suggested that Medicare and Medicaid beneficiaries have higher odds of AT use. In other words, adjusting for the other factors attenuated the effect of Medicare and Medicaid on AT use. Further examination suggested that the number of chronic conditions was primarily responsible for attenuating the effect of Medicare and the SPPB was primarily responsible for attenuating the effect of Medicaid. Contrary to what is posited in the expanded behavioral model,¹⁵ the psychosocial measure personal mastery was not associated with AT. This lack of association may be because of the particular psychosocial measure used or the fact that the developmental work that informed the expanded version of the behavioral model was based on a small sample ($n = 96$) of older African Americans and whites and was not applicable to American Indians. Also, previous research did not find an association between a related construct, self-esteem, and AT use.^{9,29}

One limitation of the current study is that the data are cross-sectional, making it impossible to determine causality or assess changes over time. The approach to assessing AT use in this study mimicked those used in the Medicare Current Beneficiary Survey and the National Long-Term Care Survey by assessing AT use in relation to ADL limitations. Although there are pros and cons to determining AT use with questions on ADL limitations,³ this has been a common approach in the research. A recent study examined how the different approaches to determining any AT use affected prevalence rates in six national surveys. It found that, in spite of the varied approaches used to measure AT use, the prevalence rates were strikingly similar. However, the authors also noted that restricting questions about AT use to only those who reported difficulty with ADLs was likely underestimating the overall prevalence of AT use in the sample. Assessing AT use in this manner does not capture persons who use AT but report no ADL difficulty.³ Because AT use was measured for this study via difficulty performing ADLs, it is likely that the estimates are conservative. Finally, another study limitation is the generalizability of the results. The participants were from one tribe and were without cognitive impairment. To address these shortcomings, future research should assess AT use with tribes from other regions and include persons with dementia.

It is unclear whether the declines in disability in older adults at the national level are the result of improved overall health or increased AT use. With the growing proportion of older adults, AT will become a more viable option for responding to functional decline in late life. Because older racial and ethnic minorities experience higher rates of disability, ensuring access to AT may help narrow this disability divide. Understanding which ADL limitations are associated with AT use can help inform health professionals who are responsible for

developing long-term care plans for older patients. Specifically, this information can be used to alert clinicians to the activities in which their patients are experiencing the most difficulty and which ones can typically be addressed with AT versus personal care. This type of information can also inform third-party coverage guidelines with respect to which devices are most often used to compensate for a patient's ADL limitations. To develop an appropriate response to the anticipated growing demands on the long-term care system by aging American Indians, AT adoption needs to be included in policy discussions with the IHS and the Centers for Medicare and Medicaid Services, as well as at the state and tribal levels.

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References

1. Assistive Technology Act of 2004. Public Law 108-364, 29 USC 3002, STAT. 1710, p 118.
2. Freedman VA, Agree EM, Martin LG, et al. Trends in the use of assistive technology and personal care for late-life disability, 1992–2001. *Gerontologist*. 2006; 46:124–127. [PubMed: 16452292]
3. Cornman JC, Freedman VA, Agree EM. Measurement of assistive device use: Implications for estimates of device use and disability in late life. *Gerontologist*. 2005; 45:347–358. [PubMed: 15933275]
4. Agree EM, Freedman VA, Cornman JC, et al. Reconsidering substitution in long-term care: When does assistive technology take the place of personal care? *J Gerontol B Psychol Sci Soc Sci*. 2005; 60B:S272–S280. [PubMed: 16131628]
5. Agree EM, Freedman VA, Sengupta M. Factors influencing the use of mobility technology in community-based long-term care. *J Aging Health*. 2004; 16:267–307. [PubMed: 15030666]
6. Resnik L, Allen S. Racial and ethnic differences in use of assistive devices for mobility: Effect modification by age. *J Aging Health*. 2006; 18:106–124. [PubMed: 16470981]
7. Mathieson KM, Kronenfeld JJ, Keith VM. Maintaining functional independence in elderly adults: The roles of health status and financial resources in predicting home modifications and use of mobility equipment. *Gerontologist*. 2002; 42:24–31. [PubMed: 11815696]
8. Hartke RJ, Prohaska TR, Furner SE. Older adults and assistive devices: Use, multiple-device use, and need. *J Aging Health*. 1998; 10:99–116. [PubMed: 10182420]
9. Tomita MR, Mann WC, Fraas LF, et al. Racial differences of frail elders in assistive technology. *Assist Technol*. 1997; 9:140–151. [PubMed: 10177451]
10. Cornman JC, Freedman VA. Racial and ethnic disparities in mobility device use in late life. *J Gerontol B Psychol Sci Soc Sci*. 2008; 63B:S34–S41. [PubMed: 18332200]
11. Waidmann TA, Liu K. Disability trends among elderly persons and implications for the future. *J Gerontol B Psychol Sci Soc Sci*. 2000; 55B:S298–S307. [PubMed: 10985301]
12. Goins RT, Spencer SM, Roubideaux Y, et al. Differences in functional disability of rural American Indian and white elders with comorbid diabetes. *Res Aging*. 2005; 27:643–658.
13. Goins RT, Moss M, Buchwald D, et al. Disability among older American Indians and Alaska Natives: An analysis of the 2000 census public use microdata sample. *Gerontologist*. 2007; 47:690–696. [PubMed: 17989411]
14. Hayward MD, Heron M. Racial inequality in active life among adult Americans. *Demography*. 1999; 36:77–91. [PubMed: 10036594]
15. Bradley EH, McGraw SA, Curry L, et al. Expanding the Andersen model: The role of psychosocial factors in long-term care use. *Health Serv Res*. 2002; 37:1221–1242. [PubMed: 12479494]
16. Andersen RM. Revisiting the behavioral model and access to medical care: Does it matter? *J Health Soc Behav*. 1995; 36:1–10. [PubMed: 7738325]

17. Fillenbaum, GG. The Duke Older Americans Resources and Services Procedures. Hillsdale, NJ: Lawrence Erlbaum; 1988. Multidimensional Functional Assessment of Older Adults.
18. Rigler SK, Studenski S, Wallace D, et al. Co-morbidity adjustment for functional outcomes in community-dwelling older adults. *Clin Rehabil.* 2002; 16:420–428. [PubMed: 12061477]
19. Guralnik JM, Simonsick EM, Ferrucci L, et al. A short physical performance battery assessing lower extremity function: Association with self-reported disability and prediction of mortality and nursing home admission. *J Gerontol.* 1994; 49:M85–M94. [PubMed: 8126356]
20. Pearlin LI, Schooler C. The structure of coping. *J Health Soc Behav.* 1978; 19:2–21. [PubMed: 649936]
21. Rhoades DA. National health data and older American Indians and Alaska Natives. *J Appl Gerontol.* 2006; 25(Suppl 1):9–26.
22. Federal Interagency Forum on Aging-Related Statistics. Older Americans 2008: Key Indicators of Well-Being. Washington, DC: U.S. Government Printing Office; 2008.
23. Loftin JD. The “harmony ethic” of the conservative Eastern Cherokees: A religious interpretation. *J Cherokee Stud.* 1983; 8:40–43.
24. Strong C. Stress and caring for elderly relatives: Interpretations and coping strategies in an American Indian and white sample. *Gerontologist.* 1984; 24:251–256. [PubMed: 6745659]
25. Langwell, K.; Cox, D.; Schur, C., et al. American Indian and Alaska Native Eligibility and Enrollment in Medicaid, SCHIP, and Medicare: Estimating Eligibility and Enrollment: A Methodological and Data Exploration. Rockville, MD: BearingPoint, Inc. and Westat; 2003.
26. Lewis, J. National Resource Center for American Indians Alaska Native and Native Hawaiian Elders, University of Alaska Anchorage; [Accessed June 12, 2010]. Lack of long term care services in Indian country: An analysis of extending Medicaid long term care funding to non638 tribal programs. [on-line]. Available at <http://elders.uaa.alaska.edu/reports/ltc-kaiser07-1.pdf>
27. Agree EM, Freedman VA. Incorporating assistive devices into community-based long-term care: An analysis of the potential for substitution and supplementation. *J Aging Health.* 2000; 12:426–450. [PubMed: 11067703]
28. Verbrugge LM, Rennert C, Madans JH. The great efficacy of personal and equipment assistance in reducing disability. *Am J Public Health.* 1997; 87:384–392. [PubMed: 9096538]
29. Tomita MR, Mann WC, Fraas LF, et al. Predictors of the use of assistive devices that address physical impairments among community-based frail elders. *J Appl Gerontol.* 2004; 23:141–155.

Table 1

Characteristics of Participants with at Least One Activity of Daily Living Limitation (n = 202)

Characteristic	Value
Predisposing factors	
Age	
Mean $\pm$ SD	72.1 $\pm$ 10.5
55–64, n (%)	61 (30.2)
65–74, n (%)	61 (30.2)
≥ 75 , n (%)	80 (39.6)
Female, n (%)	139 (68.8)
Educational Attainment, n (%)	
1–11 years	91 (45.1)
High school graduate or General Educational Development	55 (27.2)
College graduate or beyond	56 (27.7)
Enabling factors, n (%)	
Marital status	
Married or life partner	79 (39.1)
Divorced or separated	33 (16.3)
Widowed	82 (40.6)
Never married	8 (4.0)
Lives alone	60 (29.7)
Receives personal care	91 (45.1)
Medicare beneficiary	156 (77.2)
Medicaid beneficiary	57 (28.2)
Need factors	
Number of chronic conditions	
Mean $\pm$ SD	7.3 $\pm$ 3.8
0, n (%)	3 (1.5)
1–2, n (%)	19 (9.4)
3–4, n (%)	26 (12.9)
≥ 5 , n (%)	154 (76.2)
Short Physical Performance Battery score	
Mean $\pm$ SD	5.8 $\pm$ 2.8
0–3, n (%)	52 (25.7)
4–6, n (%)	73 (36.1)
7–9, n (%)	52 (25.7)
10–12, n (%)	25 (12.4)
Psychosocial factor	
Personal mastery, mean $\pm$ SD	16.4 $\pm$ 3.7

SD =standard deviation.

Table 2

Activity of Daily Living Limitations* and Assistance Use

Assistance Use [†]	Bathing (n = 71)	Dressing (n = 49)	Eating (n = 12)	Transferring (n = 100)	Walking (n = 185)	Toileting (n = 34)	Grooming (n = 23)	Getting Outside (n = 60)
Assistive technology only	15 (21.1)	2 (4.1)	0 (0)	20 (20.0)	54 (29.2)	13 (38.2)	1 (4.4)	14 (23.3)
Personal care only	9 (12.7)	31 (63.3)	4 (33.3)	13 (14.0)	11 (6.0)	1 (2.9)	12 (52.2)	6 (10.0)
Both	36 (50.7)	6 (12.2)	1 (8.3)	24 (24.0)	43 (23.2)	11 (32.4)	4 (17.4)	31 (51.7)
Neither	11 (15.5)	10 (20.4)	7 (58.3)	43 (43.0)	77 (41.6)	9 (26.5)	6 (26.1)	9 (15.0)

* Includes persons who reported some difficulty, a lot of difficulty, unable or cannot do, and does not do because of a health problem.

[†] Denominator for each row is the n for each activity limitation.

Table 3

Determinants of Assistive Technology Use for Any Activity of Daily Living Limitation (n = 202)

Determinant	Odds Ratio (95% Confidence Interval)	
	Crude	Adjusted*
Predisposing factors		
Age	1.05 (1.02–1.08)	1.00 (0.96–1.04)
Education [†]		
1–11 years	2.52 (1.27–5.00)	1.29 (0.50–3.32)
High school graduate or General Educational Development	1.60 (0.76–3.39)	1.61 (0.61–4.23)
College graduate or beyond	1.00 —	1.00 —
Enabling factors		
Married or life partner	0.52 (0.29–0.92)	0.48 (0.22–1.05)
Receives personal care	8.65 (4.40–16.98)	7.17 (3.33–15.47)
Medicare beneficiary	3.44 (1.73–6.87)	1.66 (0.63–4.36)
Medicaid beneficiary	2.61 (1.33–5.12)	1.30 (0.55–3.14)
Need factors		
Number of chronic conditions	1.22 (1.12–1.34)	1.21 (1.08–1.35)
Short Physical Performance Battery	0.83 (0.75–0.93)	0.87 (0.76–0.99)

* Model R-squared = 0.32, $P \leq .0001$; Hosmer & Lemeshow goodness of fit test chi-square (χ^2) = 3.36, degrees of freedom = 8, prob $> \chi^2 = 0.91$.

[†] Reference group = college graduate or beyond.