



Published in final edited form as:

J Assoc Nurses AIDS Care. 2018 ; 29(2): 152–162. doi:10.1016/j.jana.2017.08.008.

Characteristics of persons living with HIV who have Informal Caregivers in the cART Age of the Epidemic

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Abstract

People living with HIV (PLWH) are aging and many suffer with multi-morbidities, making caregiving a relevant and important area of study. The purpose of our study was to understand the occurrence and role of informal caregivers in the current stage of the HIV epidemic. We conducted a Web-based survey with 1373 PLWH to assess: how many had an informal, unpaid caregiver; the type of relationship with the informal caregiver; and the number of hours the caregiver provided support each day. Among respondents, 333 had an informal caregiver. African Americans, those with low income, individuals who ever had an AIDS diagnosis, those with basic cellphone service, and those living with other co-morbid conditions were significantly more likely to have an informal caregiver. Given the demographic profile of those PLWH who were most likely to have caregivers, further study is needed to understand the needs of both caregivers and care recipients.

Keywords

aging; cART era; HIV; home-based care; informal caregiver; online survey

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Disclosures: The authors report no real or perceived vested interests that relate to this article that could be construed as a conflict of interest.

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Informal caregivers are often spouses, partners, family members, friends, or neighbors who are unpaid to assist others with medical tasks or activities of daily living (Family Caregiver Alliance, 2017). Caregiving is an important scientific area of study because the number of people living longer with HIV infection is growing and these people are more likely to also be living with one or more other chronic conditions (Centers for Disease Control and Prevention, 2013). Caregivers often experience stressors that result from behavioral, physical, and cognitive declines in their care recipients' health status (Pinquart & Sörensen, 2003). Stress and mental health symptoms (e.g., depression, insomnia) are well-documented negative influences on caregiver health-related quality of life (Schulz & Sherwood, 2008). Furthermore, when the stress of caregiving becomes chronic, caregivers can become "silent patients," overburdened with the stress and responsibilities of being a caregiver and neglecting to take care of themselves (Schulz & Tompkins, 2010).

Development of interventions to support caregivers and buffer them from the stress of caregiving may have a positive synergistic effect given the bidirectional nature of the caregiver-patient relationship (Hughes, 2008). Promising strategies for improving caregivers' physical and emotional health include telephone coaching, social support, problem solving, and stress management (Hansell et al., 1998; Lopez, Crespo, & Zarit, 2007; Stewart et al., 2001). Additionally, research has shown that self-care strategies can be used to manage symptoms (Acton, 2002; Schnall, Cho, Mangone, Pichon, & Jia, Under Review; Schnall, Wantland, Velez, Cato, & Jia, 2014; Teel & Leenerts, 2005). However, the effectiveness of self-care strategies for caregivers in other diseases has been shown to vary according to environment, age, and ethnic and socio-demographic or cultural background of the caregiver (Clark et al., 2009; Gallant, 1997). This highlights the need to better understand social, environmental, and demographic differences associated with caregiver outcomes in HIV disease and to develop effective tools to identify and address them. Once evidence-based resources are identified, convenient access to those tools is needed to help caregivers manage the stress associated with caregiving (Hu, Kung, Rummans, Clark, & Lapid, 2015). The Surgeon General provided recommendations for caregivers to include: seeking medical attention for depression and anxiety, identifying sources of support in the community, maintaining physical health through exercise and adequate sleep, reducing stress, and receiving education regarding patient illness (Caregiver's Home Companion, 2006).

Given that nearly half of people living with HIV (PLWH) are older than 50 years of age and many suffer with multiple co-morbidities (Blaylock & Wortmann, 2015), caregiving is a particularly important area of study. HIV has become a chronic disease that affects physical, psychosocial, and spiritual health (Gonzalez, Penedo, Duran, Antoni, & Horne, 2007; Inez, McCain, & Elseick, 2008; Simoni, Martone, & Kerwin, 2002). Informal caregivers play an essential role in assisting PLWH to manage their medical, emotional, physical, and spiritual needs (Turner, Catania, & Gagnon, 1994; Wrubel & Folkman, 1997); but limited work has been published related to understanding the current state of PLWH in the United States who have informal caregivers.

A few studies of HIV caregivers were conducted before the widespread use of combination antiretroviral therapy (cART). A review of early literature on informal caregivers for PLWH

found that the majority of informal caregivers were male; young adults, ages 30 to 40; White or non-Hispanic; typically lovers, partners, or friends; and living in big cities (Prachakul & Grant, 2003). In addition, this review suggested that poor health, depression, and suicidal thoughts were among the physical and psychosocial risks faced by informal caregivers of PLWH. These risks were a result of the responsibilities caregiving entailed and of other factors, including HIV-seropositive status, perceived social stigma, role overload, and low income.

Today, the caregiving experience for PLWH has become particularly relevant given the shift in the epidemic to a chronic illness. HIV is no longer the acute life-threatening illness it was early in the epidemic. Rates of mortality for those infected with HIV have decreased as treatment for the disease has advanced (Baker et al., 2008; Monforte et al., 2008), and HIV in the United States is now largely a manageable chronic illness (Deeks, Lewin, & Havlir, 2013), although HIV-related co-infections (Greene, Justice, Lampiris, & Valcour, 2013) and the side-effects of cART use are still problems patients confront (Deeks & Phillips, 2009; Montessori, Press, Harris, Akagi, & Montaner, 2004). In addition, the shift in health care delivery from hospital to community and home settings has been particularly pronounced for PLWH in the United States (Chu & Selwyn, 2011). Moreover, as PLWH live longer, they are more likely to experience other chronic illnesses associated with aging, similar to their uninfected counterparts. Of the 1.2 million PLWH in the United States, 50% were older than age 50 in 2015 (Blaylock & Wortmann, 2015). By 2020, this number is expected to increase to more than 70% (Services and Advocacy for LGBT Elders, 2016). Thus, the need for informal care will continue to grow for PLWH as they live longer due to the efficacy of treatment and are also more likely to experience age-related debilitating chronic conditions (Berg, Michelson, & Safren, 2007).

The personal impact of HIV often includes fear of disclosure, stigma, rejection, fatigue, despondence, decreased interest in participating in activities, absenteeism, and loss of employment (Duffy, 2005). These factors often lead to a host of problems, not just for PLWH, but also for their caregivers (Wacharasin & Homchampa, 2008). Caregiving-related stigma, including fear of infection from caregiving activities and the stigma of affiliating with someone with HIV, may exacerbate HIV caregiver stress (Mitchell & Knowlton, 2009), making HIV disease uniquely burdensome for caregivers. These challenging factors may affect the relationship between PLWH and their caregivers and may, in turn, negatively impact the caregiving relationship and the successful provision of care.

The goal of our study was to examine the occurrence of informal caregivers in the cART age of the HIV epidemic and, more specifically, focused on PLWH with HIV-associated non-AIDS (HANA) conditions. We sought to better understand the demographic characteristics of care recipients because much of the earlier work conducted with HIV caregivers has not reported the demographic characteristics of those persons who have informal caregivers.

Methods

Between February and August 2016, U.S. PLWH were recruited online to complete a Web-based survey. The primary purpose of the survey was to assess the symptom experiences of

PLWH with HANA conditions. The methods and findings related to patients' symptoms are reported elsewhere (Iribarren et al., In Press). Briefly, banners on social networking sites (e.g., Facebook), bulletin boards (e.g., Craigslist), health sites (e.g., The Well Project) and sexual networking sites (e.g., BGCLive) advertised the study. Eligibility criteria included: HIV infection by self-report, ages 18 or older, ability to read and respond in English, U.S. resident, reporting HIV-related symptoms in the previous 30-days, and willing to participate in an online survey. The online survey took approximately 20 minutes to complete and no incentives were given. The Columbia University Medical Center Institutional Review Board approved all study procedures.

Individuals who clicked on an online study banner ad were automatically directed to a study landing page that screened potential participants. The screening survey included questions related to the eligibility criteria described above. Individuals who qualified for the study then saw an online consent form and were required to click consent before having access to the online survey. Approximately 1,895 individuals completed the online study screener and 1373 persons completed the survey.

Measures

The online survey elicited information on demographics (e.g., gender, sexual orientation, race, education, income), HANA conditions, technology use, and drug use. In addition, we asked participants whether they had an informal, unpaid caregiver, the relationship with the informal caregiver (e.g., spouse, relative, friend) and the number of hours the caregiver provided support each day. All questions had a *prefer not to answer* response option.

Demographics—Demographic information included questions about current age (in a pull-down menu), current gender identity (*male, female, transgender male, transgender female, gender queer*), gender assigned at birth (*male, female*), how they would describe their sexual orientation (*homosexual, heterosexual, bisexual*), whether they considered themselves to be Hispanic or Latino, and what race or ethnicity they considered themselves (*African American/Black/Caribbean Black, Multi-ethnic Black, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, White, or other race/ethnicity*). Participants were asked to select (from a pull-down menu) the U.S. state in which they resided, and the size of their city (i.e., *rural area, small town, suburb of a smaller urban area, suburb of a big city, big city*). In addition, level of education (*none, elementary school, some high school, high school graduate/GED, some college, associate degree/technical degree, college graduate [4 years], professional or graduate degree*) and income (*< \$10,000, \$10,000–\$19,999, \$20,000–\$39,999, \$40,000–\$59,999, \$60,000–\$79,999, \$80,000–\$99,999, \$100,000–\$149,999, \$150,000 or more, don't know*) were collected. Finally, all participants were asked if they had ever been diagnosed with AIDS.

HIV-associated non-AIDS (HANA) conditions—Participants were asked to report whether they had any of the following HANA conditions: HANA health symptoms related to asthma, bronchitis, cardiovascular disease, chronic obstructive pulmonary disease (COPD), diabetes, liver disease, osteoporosis, renal failure, or arthritis.

Drug use—Participants were asked whether they had used any of the following drugs (and could indicate any that applied) in the previous 3 months: cocaine, crack, crystal methamphetamine, downers, ecstasy, erection medication, hallucinogens, heroin, ketamine, marijuana, methadone, painkillers, and uppers.

Informal caregiving—Questions about informal caregiving were asked of all participants, including whether they had an informal caregiver (also referred to as a support person), the nature of their relationship with the caregiver (*romantic partner, family member, other*), whether they lived with their caregiver, how many years they had known their caregiver (*< a year, 1–2 years, 3 or more years*), how much time they spent each day with their caregiver (*all day, 6–18 hours, < 6 hours per day*), and whether they relied financially on this person.

Data Analysis

R software (R core team, 2013) and SAS 9.3 (SAS Institute, 2012) were used to conduct statistical analyses. Descriptive statistics were used to analyze the demographic characteristics of the overall sample. Urbanicity was collapsed into the following categories: (a) big city; (b) suburb comprised of suburb of a big city, suburb of a big town, or small town; (c) rural area. Bivariate analysis was then conducted between demographic information and having a caregiver (*Yes, No*). Next, binomial logistic regression with Lasso regularization (Friedman, Hastie, & Tibshirani, 2010) was used to assess predictors of having a caregiver. All predictor variables were entered into the model simultaneously to decrease the chance of missing important predictors due to multicollinearity. Lasso is an innovative model selection method and can provide superior prediction models as compared to traditional model selection methods (Fu, 1998). There is no traditional significance test with Lasso regression (Lockhart, Taylor, Tibshirani, & Tibshirani, 2014) and usually it is not recommended to provide statistics summaries for Lasso regression. Therefore, in our study, traditional *p*-values and confidence intervals are not reported in final multiple regression models using Lasso regularization.

We also sought to understand the demographic characteristics that were more strongly associated with having a family member, friend, or romantic partner as a caregiver. Following this analysis, we conducted a multinomial logistic regression with Lasso regularization to identify predictive characteristics of the caregiver relationship. Glmnet package in R, with leave-one-out cross-validation with a lambda that produces minimal error, was used to identify the final logistic regression models (Friedman et al., 2010).

Results

Overall, 1373 PLWH completed the Web-based survey. Most participants were male, with slightly more than half (51.27%) reporting as White, followed by African American (26.51%) and Hispanic (11.9%). Of the respondents, 333 (24%) had an informal caregiver (Table 1). In bivariate analysis, we found that males, African Americans, those with low incomes, individuals who ever had an AIDS diagnosis, those with basic cellphone service (which may be a proxy measure for low income), and those living with other HANA conditions were significantly more likely to have a caregiver. More than one-third (37.1%) of respondents reported that their caregivers were romantic partners/spouses, 119 (35.8%)

reported having a family member as their informal caregiver, and 50 (15.15%) reported that a friend was their informal caregiver.

Of the 333 participants who had a caregiver, 173 lived with that person and 159 did not. Fifteen participants had known their caregivers for less than 1 year, 24 participants had known their caregivers for 1–2 years, and 293 had known them for more than 3 years. Thirty-nine spent all day with their caregivers, 113 spent 6–18 hours per day with their caregivers, and 180 spent less than 6 hours per day with them. Eighty-two participants financially depended on their caregivers, and 250 did not.

In our logistic regression model using Lasso regularization (Table 2), we report predictive factors associated with having a caregiver. In contrast to a traditional logistic regression model, the output for this model aims to find a sparse model, and the final model does not include traditional *p*-values or confidence intervals (Lockhart et al., 2014). As an example, as can be seen in Table 2, 25–39 year olds were not included in the final model as this age group was not a predictor of having a caregiver.

Using the Lasso regularization method, the final model included predictors of having an informal caregiver as the following: number of HANA conditions (OR = 1.11), being 65 years of age or older (OR = 1.34), being bisexual (as compared to homosexual/heterosexual; OR = 1.29), African American (OR = 1.53), ever had an AIDS diagnosis (OR = 1.17), use of substances in the past 3 months (OR = 1.16), and living in a suburban or rural area (OR = 1.11). Study participants living with arthritis (OR = 1.25), COPD (OR = 1.27), osteoporosis (OR = 1.30), and renal failure (OR = 1.78) were more likely to have a caregiver; persons living with cardiovascular disease (OR = 0.84) were less likely to have an informal caregiver. Education, use of a tablet, and marijuana use were not selected as predictors of having a caregiver in the final model.

Our multinomial logistic regression model reports (Table 3) the predictor and its associated risk ratio (RR) for each type of caregiver relationship (e.g., family member, partner/spouse, friend). Specifically, males (RR = 0.48) and self-identified homosexuals (RR = 0.75) were less likely to have a family member as a caregiver. PLWH who also had a diagnosis of arthritis were more likely (RR = 1.08) to have a family member as a caregiver. PLWH who were older (RR = 1.13) were more likely to have a romantic partner or spouse as their caregiver.

Discussion

Informal caregivers have been found to play a significant role in improving outcomes in PLWH (Denison, Mitchell, Maragh-Bass, & Knowlton, 2017; M. M. Mitchell, A. C. Robinson, T. Q. Nguyen, & A. R. Knowlton, 2015), making their roles particularly important. Our study provides important information about PLWH who are most likely to have an informal caregiver. The recipients of informal caregiving, particularly for PLWH, have not been previously studied, and our study is timely given the shift of HIV from an acute to a chronic illness in which people are living longer and more likely to face co-morbid conditions.

Study participants who had a previous AIDS diagnosis and/or HANA condition(s) were more likely to have a caregiver. Based on these findings, we made an assumption that PLWH who met these characteristics were more likely to be sicker than PLWH without HANA conditions or a previous AIDS diagnosis. Income was measured by both self-reported annual income as well as by type of cell phone ownership. Basic cell phone users were more likely to be from low income groups than smartphone users (Smith, 2013).

After broadly considering all caregiver types, we found that being older, sicker, having a lower income, being bisexual, using substances, and living in a rural area were significant predictors of having a caregiver. This was to be expected, as sicker and older participants were more likely to have needs related to everyday function. PLWH with arthritis, COPD, osteoporosis, and renal failure were also more likely to have an informal caregiver, while PLWH with cardiovascular disease were less likely to have an informal caregiver. Currently, there is a dearth of literature on PLWH with HANA conditions and almost no study of the need for caregiving in this population. Further study of these associations is warranted.

Likewise, low income PLWH were less likely to be able to afford a paid caregiver or other paid nursing assistance and, therefore, were more likely to need an informal caregiver to help with everyday needs. Our findings were similar to studies in other samples of caregivers in the United States in whom being older, less mobile, and having psychological and emotional issues made it more likely for them to have a caregiver (National Alliance for Caregiving & American Association of Retired Persons, 2015). The magnitude of informal caregivers is immense, with an estimated 5.8–7 million people providing informal caregiving to persons 65 years of age and older who need assistance with everyday activities (Spector, 2000). Findings from our study as well as from national estimates (National Alliance for Caregiving & American Association of Retired Persons, 2015) support the need to develop interventions to support caregivers as the U.S. population ages and the health care system becomes more strained.

In our study, African Americans were significantly more likely than PLWH from other racial/ethnic minority groups to have an informal caregiver. This finding was consistent with other studies highlighting the usefulness of the informal caregiving relationship to support African Americans living with diabetes, cancer, and depressive symptoms, as well as those requiring long-term care in later stages of life (Ford, Tilley, & McDonald, 1998; Guidry, Aday, Zhang, & Winn, 1997; Lincoln, Chatters, & Taylor, 2005; McCann et al., 2000). African Americans with diabetes have been shown to be more likely to rely on informal support networks for disease management than their White counterparts (Ford et al., 1998). In another study, African Americans were more likely to report having access to a potential caregiver after adjusting for marital status and demographic characteristics (Roth, Haley, Wadley, Clay, & Howard, 2007).

Bisexuals, compared to homosexuals and heterosexuals, were more likely to have an informal caregiver. The type of caregiver relationship was normally distributed across friend, family, and partner, and no differences were found by type of caregiver for bisexuals, so it was unclear why bisexuals were more likely to have a caregiver. This finding has not been reported in the literature. One possible explanation is that, because men are less likely to be

caregivers than women and most of the study sample were homosexual men, bisexual men may have had a caregiver relationship with a secondary partner who was a woman (National Alliance for Caregiving & American Association of Retired Persons, 2015).

Finally, PLWH living in a rural area were more likely to have an informal caregiver. While the extent to which rural versus urban residence impacts having an informal caregiver is an understudied area, this finding was consistent with literature suggesting that both a care recipient and/or his/her caregiver in a rural area were more likely to rely on informal support compared to their urban counterparts (Goins, Spencer, & Byrd, 2009). Increased use of informal networks by rural caregivers has been associated with limitations in access and use of formal health services (Orpin, Stirling, Hetherington, & Robinson, 2014). Finally, substance-using PLWH in our study were more likely to have an informal caregiver, which was consistent with earlier research on HIV caregivers (Knowlton et al., 2007).

Interestingly, when we looked at predictors of type of caregiver (e.g., spouse/partner, family, friends), homosexual males were less likely to have a family member as their informal caregiver. This has been supported by literature that has documented that homosexuals, especially those living with HIV, were often rejected by family members (Kadushin, 1996). This has been further supported by the extant literature, which suggests that caregivers of PLWH receive less social support from a sexual partner's family if there is divergence between him and his family regarding sexual orientation or HIV status (Wight, Aneshensel, & LeBlanc, 2003). Additionally, caregivers of PLWH who were sexual partners of care recipients may concurrently struggle with concerns about their own and their partner's health (Pakenham, Dadds, & Terry, 1996), making the psychological burden and stress associated with being a caregiver even greater than in other non-infectious and non-stigmatized diseases (e.g., dementia, cancer; Dunkin & Anderson-Hanley, 1998; Etters, Goodall, & Harrison, 2008). On the other hand, in our study, older PLWH were more likely to have a spouse as a caregiver. This finding was interesting in light of the current research, which has indicated that older PLWH were more likely to live alone and less likely to have a partner (Emlet, 2006; Pirraglia et al., 2005).

The potential for selection bias was an important limitation of our study. The survey was a national Web-based survey with the potential for differences in the types of persons who had access to and would be willing to complete an anonymous online survey that included questions about their HIV disease as compared to the types of persons who might not be willing to complete such a survey. Another limitation of our study was that we did not ask when or how a particular person became the recognized caregiver. A related area for future study is the assessment of the dyadic relationship between caregivers and care recipients and whether this was a mutually identified relationship.

Conclusion

In summary, PLWH who were most likely to report having HIV caregivers included persons who were most likely to come from marginalized backgrounds, including low income, racial or ethnic minorities, older than 65 years, and living in rural settings. Given the demographic profile of PLWH who were most likely to have caregivers, further study is needed to

understand the needs of the caregivers and the care recipients. Caregivers of PLWH are an understudied population, yet the extant literature suggests that caring for a loved one with HIV presents unique demands for the caregiver, pointing to the need for interventions for caregivers of PLWH (Pinquart & Sörensen, 2003). The limited study of caregivers, themselves, for PLWH in the age of cART is increasingly relevant and an important area for further study. For example, caregivers tend to face personal chronic health problems and health risks associated with the caregiving role such as heart disease, hypertension, stroke, decreased immune function, and impaired self-care (Center on Aging Society, 2005). Half of caregivers have reported living with at least one chronic condition that was typically associated with deteriorating health, which can compromise ability to carry out the physical tasks associated with caregiving roles (Family Caregiver Alliance, 2017). This growing shift in home-based care supports the need for both caregivers and recipients to engage in health care self-management.

Acknowledgments

Research reported in this publication was supported by *the National Institute of Nursing Research* of the National Institutes of Health (award number R01NR015737; PI: Rebecca Schnall). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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Key Considerations

- The shifting trajectory of people living with HIV (PLWH), which combines increased longevity and the development of co-morbid conditions, makes it much more likely that PLWH will have the need for some form of caregiving.
- PLWH from marginalized backgrounds, including low income, racial or ethnic minorities, those older than 65 years, and those who lived in rural settings, are more likely to report having an informal caregiver.
- The health and well-being of informal caregivers is an understudied area that merits further investigation as caregiver burden may lead to a decline in the health status of both the care recipient and the caregiver.

Table 1Participant Characteristics (*N* = 1373)

	Have a caregiver			
	Yes	No	Overall	<i>P</i> -value *
	<i>n</i> = 333	<i>n</i> = 1000	<i>n</i> = 1373	
Gender, <i>n</i> (%)				0.04
Male	222 (66.7)	719 (71.9)	957 (69.7)	
Female	105 (31.5)	273 (27.3)	385 (28.0)	
Other	6 (1.8)	8 (0.8)	14 (1.02)	
Sexual orientation, <i>n</i> (%)				0.32
Homosexual	194 (58.3)	612 (61.2)	816 (59.4)	
Bisexual	41 (12.3)	95 (9.5)	141 (10.3)	
Heterosexual	98 (29.4)	293 (29.3)	399 (29.1)	
Race, <i>n</i> (%)				
White, non-Hispanic	148 (44.44)	552 (55.20)	704 (51.27)	< 0.003
Black, non-Hispanic	110 (33.03)	249 (24.90)	364 (26.51)	
Hispanic	40 (12.01)	122 (12.20)	163 (11.9)	
Other	35 (10.51)	77 (7.70)	113 (8.23)	
Unknown	0 (0.00)	0 (0.00)	29 (2.1)	
Education, <i>n</i> (%)				0.54
< high school	16 (4.8)	37 (3.7)	54 (3.9)	
High school and some college	183 (55)	543 (54.3)	733 (53.4)	
College degree or higher	133 (33.9)	418 (41.8)	554 (40.3)	
Unknown	1 (0.3)	2 (0.2)	32 (2.3)	
Income, <i>n</i> (%)				0.02
< \$20,000	148 (48)	358 (38)	506 (39.7)	
\$20,000 to \$39,999	77 (25)	222 (23.5)	299 (23.5)	
\$40,000 to \$59,999	31 (10.1)	130 (13.8)	182 (14.3)	
\$60,000 and higher	52 (16.9)	233 (24.7)	286 (22.5)	
Ever had an AIDS diagnosis, <i>n</i> (%)				0.01
Yes	138 (41.4)	338 (33.8)	479 (34.9)	
No	182 (54.7)	637 (63.7)	821 (59.8)	
Unknown	13 (3.9)	25 (2.5)	73 (5.3)	
Urbanicity <i>n</i> (%)				0.55
Big city	129 (38.74)	420 (42.0)	549 (39.99)	
Smaller urban area/town/suburb	145 (43.54)	431 (43.1)	576 (41.95)	
Rural area	30 (9.01)	71 (7.1)	101 (7.4)	
Unknown	29 (8.71)	78 (7.8)	107 (7.8)	
Number of HANA conditions, <i>n</i> (%)				< 0.0001

	Have a caregiver			
	Yes	No	Overall	<i>P</i> _value*
	<i>n</i> = 333	<i>n</i> = 1000	<i>n</i> = 1373	
0	103 (30.9)	456 (45.6)	563 (41.0)	
1	136 (40.8)	330 (33)	486 (35.4)	
2	43 (12.9)	139 (13.9)	193 (14.1)	
3+	51 (15.3)	75 (7.5)	131 (9.5)	
Phone				0.007
Basic phone	33 (10.1)	53 (5.4)	89 (6.7)	
Smart phone	279 (85.3)	899 (91.1)	1186 (89.5)	
No phone	15 (4.6)	35 (3.6)	50 (3.8)	
Tablet				0.32
Yes	108 (32.4)	354 (35.4)	464 (33.8)	
No	225 (67.6)	646 (64.6)	909 (66.2)	
Marijuana Use in the Last 3 months				0.85
Yes	99 (29.7)	292 (29.2)	391 (28.5)	
No	234 (70.3)	708 (70.8)	982 (71.5)	
Substance Use (other than marijuana) in the Last 3 months				0.19
Yes	247 (74.2)	704 (70.4)	991 (72.2)	
No	86 (25.8)	296 (29.6)	382 (27.8)	
Age				0.97
<i>M</i> (range)	48.6 (20–78)	48.6 (19–81)	48.6 (19 – 81)	
Age category				0.16
18–24	8 (2.4)	20 (2.0)	28 (2.0)	
25–39	50 (15.2)	146 (14.6)	196 (14.3)	
40–64	178 (53.45)	572 (57.2)	750 (54.6)	
65+	24 (7.21)	43 (4.3)	67 (4.9)	

Note. HANA = HIV-associated non-AIDS;

* *p* values are from chi-square statistics for categorical variables or independent-sample *t* test for continuous variable. Not all totals equal 100% due to missing data.

Table 2

Predictors and Odds Ratios of Having a Caregiver From a Binary Logistic Regression Model with Lasso Regularization ($n = 1,299$)*

Predictor	Odds Ratio
Number of HANA conditions	1.11
Sexual Orientation (Ref = Heterosexual)	
Bisexual	1.29
Age (Ref = 18–24)	
40–64	0.93
65+	1.34
Race (Ref = White)	
Black	1.53
Ever had AIDS	1.17
Annual income < \$40k	1.21
Phone (Ref = smartphone)	
Basic phone	1.52
Substance Use (other than marijuana) in 3 months	1.16
Suburb or Rural Area	1.11
Arthritis	1.25
Cardiovascular Disease	0.84
COPD	1.27
Osteoporosis	1.30
Renal failure	1.78

Note. Ref = reference; HANA = HIV-associated non-AIDS; COPD = chronic obstructive pulmonary disease;

* In addition to the variables listed above, the following variables, which were not predictors were included in the model: gender, education, own a tablet, bronchitis, and use of marijuana.

Table 3

Predictors and Risk Ratios of Caregiver Relationship for Those who had a Caregiver from a Multinomial Logistic Regression Model With Lasso Regularization ($n = 321$)^{*}

Caregiver Relationship: Family member	
Predictor	Risk Ratio
Male	0.48
Sexual Orientation (Ref = heterosexual)	
homosexual	0.75
Arthritis	1.08
Caregiver Relationship: Romantic partner or spouse	
Age (ref=18–24)	
65+	1.13

Note. Ref = reference; HANA = HIV-associated non-AIDS;

^{*} In addition to the variables listed above, the following variables, which were not predictors were included in the model: race, education, income, ever had an AIDS diagnosis, urbanicity, number and types of HANA conditions, phone type, owning a tablet, use of marijuana, and substance use (other than marijuana).