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A multi-dimensional characterization of aging and wellbeing among HIV-positive adults in Malawi

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Abstract

There is relatively little research on aging with HIV and wellbeing in sub-Saharan Africa. A cross-sectional survey was implemented in Malawi; eligible respondents were ≥30 years old and on ART for ≥2 years. Univariate and multiple regression analyses were stratified by age (younger adults: aged 30-49; older adults: aged ≥50) and gender. The median age was 51 years (total sample n=134). Viral suppression was less common among older respondents (83.7% versus 93.0% among younger respondents) although not significant in adjusted models. Despite exhibiting worse physical and cognitive functioning (any physical functioning challenge: aOR 5.35, p=0.02; cognitive functioning score difference: −0.89 points, p=0.04), older adults reported less interpersonal violence and fewer depressive symptoms (mild depression: aOR 0.23 p=0.002; major depression: aOR 0.16, p=0.004); in gender-stratified models, these relationships were significant only for females. More research is needed to disentangle the interplay between aging, gender and HIV in high-burden contexts and develop interventions to support comprehensive well-being in this population.

Keywords

Malawi; HIV; Aging; Wellbeing

INTRODUCTION

The global population is aging: the number of adults over age 65 is steadily rising from 524 million in 2010 to an estimated 1.5 billion in 2050, with most of this growth happening in low- and middle-income countries (1). Adults over age 65 will soon outnumber children

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under 5 years (1, 2), yet their health needs have been relatively under-prioritized, especially in lower-resource settings (3, 4).

The introduction of antiretroviral therapy (ART) for treatment of HIV has radically changed the profile of adult health in high-burden settings across sub-Saharan Africa. Adults on ART have life expectancies nearly equivalent to their HIV-negative peers (5) [median of over 70 years of age (6)], so they are vulnerable to both diseases of aging and possible side effects of long-term HIV and ART use (7). Aging on ART is a critical topic and there is an urgent need to address the health needs of this population, particularly in low-income settings (8–11).

There are few studies about comprehensive wellbeing – incorporating multiple dimensions of health, functioning and quality of life – in older adults on ART. Wellbeing could be associated with improved adherence (12), healthier aging (13), and better quality of life (10). Mental health is a particularly salient issue for people living with HIV (12, 14); but depression among older adults, especially those living with comorbidities, can go unrecognized (15), and untreated depression can affect ART adherence thereby resulting in poor virologic control and clinical outcomes (16, 17). Adults living with HIV may also experience stressors such as stigma, challenges with HIV disclosure, and compromised quality of life (13).

Malawi is a low-income country in southeastern Africa with many recent public health successes. Despite high HIV burden (18) and a resource-constrained health system, 78% of HIV-positive Malawian adults are on ART and 91% of Malawians on ART are virally suppressed (19). Approximately 15% of the Malawian population over 45 years old is HIV-positive (20), yet there is little evidence of what aging with HIV looks like in this context. Previous studies have identified depression rates of between 25-40% in adult Malawian populations, both without and with HIV (21–24) [slightly higher than the 15% prevalence of depression among HIV-positive adults in sub-Saharan Africa found in a recent meta-analysis (12)] – but we have identified no studies about comprehensive wellbeing among HIV-positive adults in Malawi.

We conducted a multi-dimensional assessment of wellbeing among aging adults on ART in Malawi with a focus on differences between older adults on ART (aged 50) versus younger adults on ART (aged 30-49), across wellbeing indicators: physical and cognitive functioning, mental health, social relationships, disability, food security. We also explored how the relationship between aging and wellbeing differs by gender in this setting.

METHODS

Site and sample selection:

This research was conducted at Partners in Hope Medical Center, a large nonprofit health care organization in Lilongwe, Malawi. Partners in Hope operates a free HIV treatment program, from which adult study participants were recruited. Eligible participants were 30 years of age, on ART for at least two years (based on client self-report and confirmed by medical record review), and not acutely ill on the day of data collection (as self-reported by clients during the recruitment process). Trained research assistants recruited potential

participants while they waited for ART services. Individuals who expressed interest in the study were taken to a private location for assessing eligibility; and, if eligible, provided oral informed consent for anonymous data collection. Participants and research assistants were matched by gender to promote open, honest dialogue during data collection.

Survey instrument:

The survey tool was based on the HAALSI (Health and Aging in Africa: A Longitudinal Study of an INDEPTH Community in South Africa) instrument (25), including modules on self-reported health and subjective wellbeing, social isolation and perceived social environment, cognition, the Center for Epidemiologic Studies Depression Scale (CES-D) (26), substance use (27), cognitive functioning (28) and physical functioning (29). Some modules were edited for length and for the Malawi cultural context. We added modules on food security (30), intimate partner violence (HARK scale) (31) and HIV-related stigma (13). The survey was translated from English to Chichewa (local language of Malawi) and back-translated to English by an independent researcher. The study team refined the Chichewa-language instrument to ensure the meaning of all questions and response options closely matched the original English.

Data collection:

Two Malawian researchers (bilingual in Chichewa and English, and highly experienced in administering surveys to this population) were trained on the objectives of this study, and the specific data collection instruments. This included extensive practice and pilot testing with a minimum of 3 respondents of each gender, with thorough debriefs with the full study team to ensure that the survey was appropriate for implementation.

The survey was administered as an interview, with all questions and response options read aloud by the research assistant, and close-ended answers recorded on tablets. Clinical referrals were offered to all respondents who positively answered questions regarding alcohol use disorder, intimate partner violence (physical, sexual or emotional abuse) or signs of depression, or if the respondent demonstrated distress during the survey. Referred participants were immediately evaluated by a clinician at Partners in Hope to receive further assessment and onward referral to specialty care as needed. Those who declined a referral were encouraged to follow up with a clinician at a later time.

Medical record data were collected for all respondents who completed a survey, including date of HIV diagnosis and of ART initiation, current ART regimen and reported adherence at most recent visit, most recent viral load measurement, and anthropometrics at most recent visit (height, weight, body mass index). Since the study was conducted as a new first-line ART regimen was being introduced, we also collected data on prior ART regimens and dates of change.

Key variables:

Table 1 presents all key variables used in this analysis, and how these were operationalized based on survey questions. The research objective was to compare older adults (aged 50) to younger adults (aged 30-49), so this was our independent variable. Dependent variables

captured different domains of wellbeing including health behaviors and outcomes, physical and cognitive functioning, and social and mental health. Given the importance of understanding the potential psychiatric side effects of ART, we also explored whether there was an association between ART regimen (efavirenz- and dolutegravir-based regimens) and reporting of symptoms of depression.

Data analysis:

Comparisons between the older (adults aged 50) and younger (adults aged 30-49) groups used a chi-square test of difference except for continuous variables (which used a Kruskal-Wallis test for comparison of median values). The multiple regression models included all of the following covariates, selected due to hypothesized role in the relationship between age and wellbeing: gender, education, employment type, household wealth group, years since ART initiation, number of living children under 15 years of age, and whether the respondent reported being currently married. Fully unadjusted models did not yield substantially different findings (data not shown) so only models with all covariates were included. The gender-stratified models included these same covariates except gender. Multiple regression models were specified using the appropriate functional form for the dependent variable: logistic regression for binary outcomes (reporting odds ratios), linear regression for continuous variables, and Poisson for count variables (reporting incidence rate ratio). All models used robust standard errors. Statistical significance is explored up to the $p<0.1$ level, due to the exploratory nature of this study.

Ethical review:

Approval was obtained from the Institutional Review Boards at the University of California Los Angeles, and the Malawi National Health Science Research Committee.

RESULTS

Description of the sample

In total, 134 participants completed the survey (Table 2). The median age of the sample was 51 years (IQR 42, 58). Half the sample (66 respondents, 49.3%) was female. Younger adults (age 30-49) were more likely to have higher levels of educational attainment: 36.7% (n=22) had completed secondary school or beyond versus only 23% (n=17) of older adults. Approximately 15% of respondents were not working (a slightly but non-significantly higher percentage of older adults reported not working); and among those who were employed, a casual or household-level enterprise (such as farming) was most common.

The older adult group had been on ART for significantly longer than younger adults: 9.3 years on average (range 2-17 years) for those 50 versus 7.7 years on average (range 2-14 years) for those below age 50; but were significantly less likely to be virally suppressed at the most recent measurement (<200 copies/mL), which was taken a median of 137 days before the survey date. Approximately half of respondents were taking the new first-line regimen of dolutegravir with tenofovir and lamivudine, and one-third were on the prior first-line regimen of efavirenz with tenofovir and lamivudine, but this did not differ by age category.

Physical & cognitive functioning

Older adults were much more likely to report difficulties in physical functioning (activities of daily living such as walking, bathing, dressing, eating, using the toilet or getting in or out of bed): 27.0% of respondents age 50 and over reported at least one such challenge, versus 11.7% of adults between ages 30-49 (Table 3). This difference was significant in multivariable models, but only significant among women (not among men) when the models were gender-stratified. (Under 20% of male respondents over age 50 reported any physical functioning problem, versus 36% of older female respondents, see Appendix) Older adults also had lower cognition, with a 1-point deficit, on average, in multivariable models. This was significant only for women in gender-stratified models, although women over age 50 had slightly higher cognition scores than men over age 50, 16.4 points on average versus 15.7 points on average respectively (Appendix 1).

Health behaviors & outcomes

Despite difficulties with physical functioning, older adults had higher life satisfaction (6.4 points on a 0-10 scale on average, versus 5.6 points for younger adults), but this was not significant in a multivariable model (among all, or when gender-stratified). Older adults were also less likely to report food insecurity (average score of 1.6 among younger adults, versus 0.9 among older adults) and this was a significant difference in the multivariable model; when gender-stratified, the relationship was borderline significant for women only (p=0.07). Older adults were significantly less likely to report alcohol use, although this was a low-consumption sample overall: approximately half of respondents (n=62, 46.3%) said they had never consumed alcohol, and among current drinkers, most (n=16, 76.2%) said they consumed at least one drink only a few days per month; however, 10 people (13.9% of the ever-drinker sample) reported binge drinking (6 or more drinks at one time). (Current alcohol consumption among older adults was exclusively among men, Appendix 1.) Tobacco use was also uncommon: only 7 respondents [5.2% of the full sample) said they had ever used tobacco, and all but one of these were below age 50 (results not shown)].

Older adults were more likely to have a high viral load (23.6% of older adults versus 7.02% of younger adults), although this was limited by small sample size and only borderline significant in the multivariable model (aOR 6.89, p =0.06). Within the older adult population, more men had a high viral load than women (33.3% of older men versus 13.9% of older women, Appendix 1).

Social & mental health

Over two-thirds of respondents in both age groups reported social isolation (defined as more frequently feeling left out, lonely, or lacking companionship); a nonsignificant positive relationship was seen between aging and social isolation, in the full and gender-stratified models. Older adults also reported significantly less interpersonal violence (24.3% of older adults reported ever experiencing interpersonal violence, versus 46.7% of younger adults, aOR 0.24, p=0.02); in stratified models, this relationship was significant only for women. Approximately one-quarter of older adults, regardless of gender, reported a history of interpersonal violence (Appendix 1). Older adults were also significantly and substantially less likely to be classified as exhibiting mild or major depressive symptoms, with adjusted

odds ratios of 0.23 versus younger adults (p=0.002) using a CESD score cutoff of 16; and odds ratio of 0.16 (p=0.004) using a CESD score cutoff of 27. In stratified analyses, older women were significantly more likely to report depressive symptoms than younger women, but no significant relationship was seen between aging and depressive symptoms for men.

No association was found between type of ART regimen and reporting of depressive symptoms (data not shown). Approximately 45% of respondents on an efavirenz-based regimen had a CESD score above 16 versus 46% of those on a dolutegravir-based regimen; and using a stricter CESD cutoff of 27, approximately 15% of those on an efavirenz-based regimen, and 20% of those on a dolutegravir-based regimen, were classified as showing depressive symptoms.

Discussion

In this survey, which captured multi-dimensional wellbeing among adults on ART in Malawi, we found that older adults (50 years old) experienced slightly higher levels of disability – represented by measures of physical and cognitive functioning – but reported fewer symptoms of depression, less likelihood of having experienced interpersonal violence, and higher levels of food security. In gender-stratified multivariable models, all relationships remained significant (at the level of p<0.1) only for women.

These findings of greater physical and cognitive challenges among older-age women resonates with the broader aging literature in HIV-negative populations (7, 32). While there are limited data from sub-Saharan Africa (4), the HAALSI study in South Africa similarly found increased cognitive impairment among older adults, especially HIV-positive older women (33–35); and other studies have found that aging women demonstrate worse physical (7, 36) and cognitive (37) functioning. The literature has also identified an association between later-life cognitive function and childhood deprivation (38), suggesting important complexities in the causes and consequences of cognitive impairment, which is richly deserving of further study particularly given potential gender differences. There are also other gender-associated aging differences in the literature, including higher rates of depression and of chronic conditions and disability among HIV-negative women (39); and HIV-positive women reporting lower quality of life (based on physical functioning and mental health measures) (40).

Our study participants reported more difficulties in activities of daily living compared to previous studies, although data on physical functioning among HIV-positive African populations are sparse. A study from Nigeria found worse physical functioning among people living with HIV compared to their HIV-negative counterparts (36), and HAALSI found a strong significant association between HIV seropositivity and worse physical functioning (29). The intersections between HIV status and physical functioning deserve further study. Compromised physical functioning at older ages among people living with HIV could be due to physiologic mechanisms: HIV infection is associated with early onset of diseases of aging, including non-communicable diseases, cognitive decline, and frailty (10); and chronic inflammation resulting from low-level HIV replication and other co-infections such as cytomegalovirus have been implicated in this pathway, although the

precise mechanisms remain elusive (41). Or there may be regional or cultural differences in the aging process or the contribution of HIV infection, or both (42, 43). The unique picture of aging with HIV is poorly understood in sub-Saharan Africa.

Older adults in our study, especialy men, had higher viral loads (viremia 200 copies/mL) than younger respondents. This is in contrast to previous studies from sub-Saharan Africa that have found better HIV treatment outcomes (including viral suppression and retention in care) among older adults (44–46) – although a recent meta-analysis of studies from Africa did not find a significant age-related difference in ART adherence (47). It is therefore difficult to contextualize this finding with the broader literature, given the lack of a clear consensus on the relationship between aging and HIV-related outcomes in Africa. It is important to note, however, the high rate of viral suppression in our study population as well as small sample size, which may have limited our ability to detect differences across groups.

In this study population, using the CESD scale, 43% of respondents reported symptoms of any depression, and 18% of these met the cut-off for major depression. This is very similar to the findings of a recent meta-analysis, which estimated that 15.3% of HIV-positive adults in sub-Saharan Africa exhibit symptoms of major depression (12) and another recent study that found 41% of Malawian adults with diabetes (HIV status unspecified) had symptoms of mild or major depression (21). Our estimate of overall depression is slightly higher than two recent studies from Malawi, which estimated that approximately 25-30% of HIV-positive adults in Malawi had symptoms of mild or major depression (23, 24). We were specifically interested in exploring depression among HIV-positive older adults, which has not been as well-documented in this literature. To our knowledge, only one other study has examined the question of aging and depression in Malawi; it found higher likelihoods of depressive symptoms among women and as age increased above age 45 – but included primarily HIV-negative respondents (95% of the study population) and only adults over age 45 (48). In our study, HIV-positive older adults aged 50 were less likely to report depressive symptoms than younger adults aged 30-49; and this difference remained significant in multivariable models, although only for women when the analyses were gender-stratified. This is similar to results from research elsewhere in sub-Saharan Africa, where older adults were found to have lower levels of depression and higher levels of social support than their younger adult counterparts (49). Understanding how age, gender and mental health interact in adults on ART may identify important opportunities for interventions and improved clinical care (50) particularly since the presentation of depression among older adults (including intersections with daily functioning) may be unique (51).

Our study has several limitations. As a cross-sectional study, we cannot disentangle age, period and cohort effects – so longitudinal analyses should be used to better understand whether, for example, this is a true age-related change in mental health or a possible cohort effect. Our sample size may have been too small to detect statistically significant associations, especially in the gender-stratified analyses and in models that included several covariates; we did explore fully unadjusted models and the results were robust to the exclusion of these covariates. We also did not have data on certain key HIV outcomes, such as CD4 count, because these were not available in this setting. Additonally, not all measures included in our study have been validated in Malawi or similar contexts. We tried to

minimize this possible measurement bias by relying heavily on work done in South Africa and other low-resource settings and performing extensive pilot testing before implementation of the study, but further work should be done to develop and validate tools for use in these contexts. It is also critical to note that many of these domains are complex and multi-dimensional; although we used previously-designed survey questions to assess these, further study is needed on whether such brief batteries are sufficient to validly and reliably measure these constructs. Our study may also be subject to reporting bias due to social desirability or, in an older-age population with compromised cognitive functioning, challenges with comprehension or recall. Lastly, these findings should be generalized with caution. Data were collected at a health facility among participants well enough to complete the survey. We lack data from those with worse health or significant mobility challenges who are largely home-bound. Further study should be pursued using community-based surveys, to capture this important population and to explore issues related to aging in the community context.

Conclusions

In this cohort of adults on ART at an urban health facility in Malawi, older adults (particularly women) reported better mental health and social relationships as compared to their younger counterparts, despite worse physical and cognitive functioning and a trend towards lower rates of viral suppression. In high-burden, low-resource settings where the population of people living with HIV is aging and facing an accompanying burden of non-communicable diseases, there is still a paucity of information on wellbeing at older ages. Further investigation is needed to thoroughly understand the effects of aging on people living with HIV and on ART, in order to better inform policies and programs aimed at improving overall health and HIV-related outcomes.

ACKNOWLEDGEMENTS

Appendix

Table 1:

Wellbeing among female and male older adults, aged 50+

	Unadjusted statistics among adults 50+ (n=74)	
	Females (n=36)	**Males (n=38)**
Any physical functioning problem, n (%)	13 (36.1%)	7 (18.4%)
Cognition (0-27 scale), mean (median)	16.4 (16.8)	15.7 (15.5)
Much better/better health today vs one year ago, n (%)	28 (77.8%)	19 (50.0%)
Life satisfaction (0-10 scale), mean (median)	6.9 (8)	6 (6)
Food security (0-6 scale), mean (median)	1.4 (1)	0.4 (0)
Current drinker (in last 30 days), n (%)	0	4 (10.5%)
High viral load (200+ copies/mL)[a], n (%)	5 (13.9%)	12 (33.3%)
Any reported social isolation, n (%)	27 (75.0%)	24 (63.2%)
Social environment (0-16) scale, mean (median)	9.6 (10)	9.9 (10)
Symptoms of mild or major depression (CESD score 16+), n (%)	9 (25.0%)	15 (39.5%)
Symptoms of major depression (CESD score 27+), n (%)	4 (11.1%)	4 (10.5%)
Any intimate partner violence, n (%)	8 (22.2%)	10 (26.3%)

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Table 1:

Definition of key variables in the analysis

Independent variable	Age group (binary)	Aged 30-49 years, or 50+ years
Dependent variables	**Physical & cognitive functioning:**	
	Any physical functioning problem (yes/no) *(HAALSI instrument)*[30]	Reported difficulty with walking, dressing, bathing, eating, getting into bed, or using the toilet
	Cognitive functioning score (range 0-27) *(adapted from orientation and Mini-Mental State exams)*[29]	Word list recall (immediate and delayed recalls)*(Adapted from MMSE for cultural context)*; counted correctly *(Adapted for cultural context)*, knew correct current year, month, date, and president; naming everyday objects (pencil, lion) *(Adapted for cultural context)*
	Health behaviors & outcomes:	
	Better health than one year ago (yes/no)*(HAALSI instrument)*[26]	Think back to your life one year ago, and how you felt about your health then. Compared to one year ago, how would you rate your health today? (Better or much better, versus same, worse or much worse)
	Life satisfaction score (range 0-10) *(HAALSI instrument)*[26]	All things considered, how satisfied are you with your life as a whole these days?
	Food security score (range 0-6) *(Malawian Household Food Insecurity Access Scale)*[31]	Reported frequency of limiting portion sizes at meal time, reducing number of meals eaten per day, and borrowing food/relying on help from friend or family for food
	Current alcohol use (yes/no) *(abbreviated HAALSI)*[26]	Ever drinker, and if so, drink alcohol in last 30 days
	Virally suppressed (yes/no) *(objective chart data)*[‡]	Viral load below 200 copies per mL at the most recent measurement during the last year
	Social & mental health:	
	Social isolation (yes/no)[26]	Ever feel left out, lonely, or lacking companionship
	Social environment score (range 0-16) *(HAALSI instrument)*[26]	Degree of: liking village, finding it safe, and feeling a part of it; feeling that people in village work together to solve problems, help each other, can be trusted
	Symptoms of mild or major depression (yes/no) *(CESD scale)*[27]	Score of 16+ on CESD scale (cutoff selected per global recommendations[14,27])
	Symptoms of major depression (yes/no) *(CESD scale)*[27]	Score of 27+ on CESD scale[50]
	Any intimate partner violence (yes/no) *(HARK scale)*[32]	Ever emotionally, sexually, physically abused by, or afraid of, partner or expartner
Covariates	Gender (binary)	Male or female
	Highest educational level attained (categorical)	No schooling, some primary school, completed primary school, some secondary school, completed secondary school, went beyond secondary school
	Employment type (categorical)	Casual or household work including farming, wage work, no work, retired
	Currently married (yes/no)	Married or unmarried (including single, boyfriend/girlfriend either casual or steady, separated/divorced, widowed)
	Number of living children (continuous)	Biological plus non-biological children below age 15
	Years since ART initiation (continuous) *(objective chart data)*[‡]	Number of years (rounded)
	Current ART regimen (categorical) *(objective chart data)*[‡]	ART regimen at most recent visit: TDF/3TC/EFV (tenofovir/lamivudine/ efavirenz); TDF/3TC/DTG (tenofovir/lamivudine/dolutegravir); or "other" (nevirapine-based, boosted protease inhibitor-based, dolutegravir with zidovudine/lamivudine)
	Household wealth (categorical) *(Abbreviated HAALSI)*	Quintile groupings based on assets: ownership of automobile, bicycle, motorbike, household durable goods (items of furniture, radio, television,

		cellular phone), household infrastructure (roofing, electricity sources), livestock (cattle, goats, chickens, pigs)

All were self-reported on the survey instrument except those noted with ‡, which were collected via chart review

Table 2:

Description of the study sample

	Full sample	30-49 years	50 years	p-value
	n=134	n=60	n=74	
Age, median (range)	51 (30-88)	41 (30-49)	57 (50-88)	
Gender: female, n (%)	66 (49.3%)	30 (50.0%)	36 (48.7%)	0.88
Education: None (reference)	14 (10.5%)	3 (5.0%)	11 (14.9%)	0.19
Some primary	42 (31.3%)	18 (30.0%)	24 (32.4%)	
Finished primary	12 (9.0%)	5 (8.3%)	7 (9.5%)	
Some secondary	27 (20.2%)	12 (20.0%)	15 (20.3%)	
Finished secondary	19 (14.2%)	13 (21.7%)	6 (8.1%)	
Beyond secondary	20 (14.9%)	9 (15.0%)	11 (14.9%)	
Employment: None (reference)	20 (14.9%)	8 (13.3%)	12 (16.2%)	0.16
Casual/household work (including agriculture)	80 (59.7%)	41 (68.3%)	39 (52.7%)	
Wage work	34 (25.4%)	11 (18.3%)	23 (31.1%)	
Married: yes, n (%)	87 (64.9%)	41 (68.3%)	46 (62.2%)	0.46
Among those married, disclosed HIV status to partner: yes, n (%)	78 (97.5%)	39 (97.5%)	39 (97.5%)	1.00
Number of living children <15 years old, median (range)	1 (0-9)	1 (0-8)	0 (0-9)	0.03
Years since ART initiation, median (range)	9.0 (2-17)	7.5 (2-14)	10.0 (2-17)	0.003
Virally suppressed (<200 copies/mL), n (%)	108 (83.7%)	53 (93.0%)	55 (76.4%)	0.011
Current ART regimen [†]:				0.39
TDF/3TC/EFV	40 (29.9%)	21 (35.0%)	19 (25.7%)	
TDF/3TC/DTG	71 (53.0%)	28 (46.7%)	43 (58.1%)	
Other	23 (17.2%)	11 (18.3%)	12 (16.2%)	

p-value based on chi-square test of difference for all except number of living children and years since ART initiation both of which used a Kruskal–Wallis test for difference in median values

Viral suppression at most recent measure within the last year

1 respondent was missing viral load information, and 7 did not have a recent viral load measure (within the last year)

[†] TDF/3TC/EFV: tenofovir/lamivudine/efavirenz; TDF/3TC/DTG: tenofovir/lamivudine/dolutegravir. Other ART regimens included: nevirapine-based (n=10), boosted protease inhibitor-based (n=12), dolutegravir with zidovudine/lamivudine (n=1)

Table 3:

Wellbeing among older (aged 50) versus younger (aged 30-49) adults

	Unadjusted statistics			Multivariable model coefficients: Age 50 (versus 30-49)		
	Among adults <50 (n=60)	Among adults 50 (n=74)		Overall (n=134)	Among females (n=66)	Among males (n=68)
Physical & cognitive functioning						
Any physical functioning problem, n (%)	7 (11.7%)	20 (27.0%)	Any physical functioning problem, odds ratio (95% CI)	5.35 * (1.31, 21.90)	48.50 ** (4.91, 479.40)	1.24 (0.03, 46.66)
				p=0.02	p=0.001	p=0.91
Cognition (0-27 scale), mean (median)	17.4 (17.5)	16.0 (16.3)	Cognition (0-27 scale), OLS coefficient (95% CI)	−0.89 * (−1.76, −0.03)	−1.33 * (−2.56, −0.15)	−1.08 † (−2.33, 0.16)
				p=0.04	p=0.03	p=0.09
Health behaviors & outcomes						
Much better/better health today vs one year ago, n (%)	31 (51.7%)	47 (63.5%)	Much better/better health today vs one year ago, odds ratio (95% CI)	1.67 (0.70, 3.92)	2.38 (0.45, 11.72)	0.81 (0.21, 3.14)
				p=0.25	p=0.32	p=0.76
Life satisfaction (0-10 scale), mean (median)	5.6 (5)	6.4 (6)	Life satisfaction (0-10 scale), IRR (95% CI)	1.15 † (1.00, 1.32)	1.15 (0.92, 1.45)	1.03 (0.91, 1.16)
				p=0.05	p=0.23	p=0.65
Food security (0-6 scale), mean (median)	4.4 (5)	5.1 (6)	Food security (0-6 scale), IRR (95% CI)	0.55 * (0.35, 0.85)	0.63 † (0.38, 1.04)	0.70 (0.28, 1.78)
				p=0.008	p=0.07	p=0.46
Current drinker (in last 30 days), n (%)	15 (25.0%)	4 (5.4%)	Current drinker (in last 30 days), odds ratio (95% CI)	0.28 * (0.08, 0.91)	n/a	0.23 † (0.05, 1.21)
				p=0.04	n/a	p=0.08
High viral load (200+ copies/mL)[a], n (%)	4 (7.0%)	17 (23.6%)	High viral load (200+)[a], odds ratio (95% CI)	6.89 † (0.95, 49.98)	1.54 (0.16, 15.0)	n/a
				p=0.06	p=0.71	n/a
Social & mental health						
Any reported social isolation, n (%)	40 (66.7%)	51 (68.9%)	Any reported social isolation, odds ratio (95% CI)	1.03 (0.42, 2.55)	2.34 (0.25, 22.32)	1.26 (0.31, 5.03)
				p=0.95	p=0.46	p=0.75
Social environment (0-16) scale, mean (median)	9.3 (9)	9.8 (10)	Social environment score (0-16 scale), IRR (95% CI)	1.06 (0.98, 1.16)	1.02 (0.94, 1.10)	1.12 (0.94, 1.33)
				p=0.16	p=0.66	p=0.21
Symptoms of mild or major depression (CESD score 16+), n (%)	34 (56.7%)	24 (32.4%)	Symptoms of mild or major depression (CESD score 16+), odds ratio (95% CI)	0.23 ** (0.09, 0.59)	0.05 ** (0.006, 0.47)	0.86 (0.16, 4.60)
				p=0.002	p=0.008	p=0.86
Symptoms of major depression (CESD score 27+), n (%)	16 (26.7%)	8 (10.8%)	Symptoms of major depression (CESD score 27+), odds ratio (95% CI)	0.16 ** (0.04, 0.56)	0.06 † (0.003, 1.16)	0.30 (0.03, 3.15)
				p=0.004	p=0.06	p=0.31

	Unadjusted statistics			Multivariable model coefficients: Age 50 (versus 30-49)		
	Among adults <50 (n=60)	Among adults 50 (n=74)		Overall (n=134)	Among females (n=66)	Among males (n=68)
Any intimate partner violence, n (%)	28 (46.7%)	18 (24.3%)	Any intimate partner violence, odds ratio (95% CI)	0.24 *(0.07, 0.82)	0.02 †(0.001, 1.06)	0.42 (0.05, 3.15)
				p=0.02	p=0.05	p=0.40

All multivariable models include covariates for: gender (for sex-pooled "overall" column only), education (no education, some primary, finished primary, some secondary, finished secondary, beyond secondary), employment (none, casual/household work including agriculture, wage work), household SES (based on asset index, quintile groupings), year of ART initiation, number of living children, currently married (yes/no)

†
p < 0.1,

*
p < 0.05,

**
p < 0.01,

***
p < 0.001

a
Viral load measured at most recent clinical visit during last 12 months

IRR: incidence rate ratio; CI: confidence interval