Prevalence of chronic conditions, their risk factors and associated disability in people aged 50 years and above infected or affected by HIV in Uganda

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Abstract

Background

Data on chronic conditions and their effect on disability in older people infected or affected by HIV are scarce in African settings.

Objectives

We aim to describe (1) the prevalence of chronic conditions and level of functioning in older people infected or affected by HIV and the related risk factors, and (2) draw attention to associations between these chronic diseases and disability.

Methods

Cross-sectional survey data were analyzed from one rural site and one semi-urban site in Uganda. The study population focuses on older adults aged 50 and older who were infected or affected by HIV. A questionnaire adapted from the World Health Organization Study on global AGEing and adult health (SAGE) was administered to all study participants. Diagnoses of chronic conditions were made through self-report while disability was determined using the 12-item WHO Disability Assessment Schedule (WHODAS2.0).

Results

In total, 471 participants were surveyed. The median age of study participants was 63 (range 50-101). Half of the study participants (52%) were HIV infected; 63% are women. People living with HIV had different rates of chronic conditions and risk factors than uninfected participants. Chronic obstructive pulmonary disease was more prevalent in HIV infected participants. Hypertension, diabetes mellitus, visual acuity and angina were more prevalent in HIV uninfected participants; and, generally, risk factors (tobacco and alcohol use) were more prevalent in this group. Sleep problems, even when mild, (coefficient 14.2 95% CI 7.3-21.0) and depression (coefficient 9.4 95% CI 1.2-17.0) were strongly associated with higher disability scores.

Conclusion

Older adults in Uganda are living with a range of chronic conditions that affect their functioning and quality of life. Many of these conditions and related risk factors are not currently addressed by health services in Uganda. There is need to revise the health care policy in Uganda to consider the health needs of older people, especially those infected or affected by HIV and AIDS.

Introduction

With shifts in the global burden of disease, chronic diseases represent a significant proportion of illnesses even in developing countries [1]. Few studies, however, have individual-level data to elucidate the prevalence, risk factors and associated disability due to chronic disease in older people in low-income countries; data are particularly limited in sub-Saharan Africa.

Comprehensive studies on chronic diseases in low- and middle-income countries primarily have concentrated on younger and middle-aged people [2-7] with just a few focusing on older adults [6, 8-10]. In sub-Saharan Africa, the number and proportion of older people is increasing and is projected to continue to grow [11, 12], making it particularly important to understand their experiences with chronic disease. As African populations age, the prevalence of individuals with chronic conditions in these settings is likely to increase. Despite these demographic changes, data providing precise estimates for prevalence, patterns, risk factors and the burden of chronic diseases and conditions in older people in Africa are scarce.

Using a unique dataset from Uganda, this paper describes the prevalence of chronic diseases, including angina, arthritis, chronic obstructive pulmonary disease, depression, diabetes mellitus, hypertension, stroke, and vision problems,, the prevalence of related risk factors, and levels of disability in adults aged 50 years and older (50-plus). In addition, we describe the association between chronic disease and functioning, making use of the World Health Organization Disability Assessment Schedule (WHODAS 2.0). The differences between older people who are infected or affected by HIV are explored. In this way, this paper adds to the literature available on the prevalence and risk factors of chronic conditions and how these impact disability in older Africans.

Background

Chronic diseases are illnesses or conditions that require ongoing medical attention and affect a person's daily life [13]. Chronic diseases include cancers, cardiovascular diseases, chronic respiratory diseases, diabetes, hypertension, mental disorders, and stroke. Other chronic impairments that commonly affect people include arthritis, rheumatism, dental, vision, stomach, and intestinal problems [10]. Importantly, in the African context, as access to antiretroviral treatment increases, resulting in longer survival with the infection, HIV is now considered a chronic condition in many settings [16].

Chronic diseases can affect people of all age groups, but are more common in older adults and more likely to have negative consequences. For example, in a study of mortality and burden of disease, an increase in deaths is projected for all ages related to chronic disease (excluding HIV), with 35 million deaths resulting from chronic diseases in 2005 and 41 million deaths in 2015 [17]. Nearly 60 percent of the deaths in each year are estimated to occur among those aged 70-plus years. Research from Southern Africa shows that rates of chronic diseases (not including HIV) are higher among those aged 50-plus compared to those aged 18-49 [9]. Another study in South Africa showed that there were more chronic conditions (excluding HIV) in later old age (65-plus) than early old age (below 65) [6].

A number of studies have been conducted in sub-Saharan Africa on chronic conditions in adults [4-6, 18-23]. However, few studies provide information on concurrent chronic conditions, including HIV [21], and fewer still are available on that simultaneously examine chronic diseases in older people infected and affected by HIV and AIDS [24]. Yet we know older people are more likely to have chronic diseases[25]. With the exception of HIV, many chronic diseases share common risk factors. These include excessive alcohol

use, tobacco use, unhealthy diets and physical inactivity. Current health behaviors, as well as the accumulated impact from a lifetime of harmful health behaviors contribute to the higher likelihood of contracting a chronic condition in older age.

Methods

Data for this analysis come from Wave 2 of the longitudinal SAGE-Wellbeing of Older People Study (WOPS). The SAGE-WOPS HIV study in Uganda was implemented in older people (50-plus years) infected or affected by HIV and AIDS. To date, two waves of data are available: WOPS1 in 2009-2010 and WOPS2 in 2012-2013.

Participants were randomly selected into groups, with interviews conducted in two sites —a rural area in Kalungu district and a semi-urban area in Wakiso district on the shores of Lake Victoria near Entebbe. The study setting, study population and data collection have been described elsewhere [24, 30]. Briefly, the WOPS1 sample consisted of 510 older people (61.2% female, mean age 65 and age range 50-96 years). WOPS2 re-interviewed those respondents who were still living in the area; 148 respondents were lost to follow-up (these included 67 who had died, 25 who emigrated from the study area, 17 who were found but refused to participate, 9 who were too sick, 4 who had travelled on the day of the interviews, 4 who were too busy to participate in the interviews, the remaining could not be located). The sample for WOPS2 consisted of 471 older people (63% women, mean age 64.5 years and age range 50-101 years). The WOPS2 response rate was 70.9%. There was no replacement of older adults who had died or were lost to follow-up from WOPS1. However in WOPS2, we recruited an additional 100 people living with HIV from a third site around Masaka town. These respondents, who were aged 55 years and over, were recruited to increase the number of people living with HIV in the cohort. All the new recruits were

randomly selected from among older people attending The AIDS Support Organization (TASO), a non-governmental organization in Masaka town.

Half of the respondents in this study were HIV positive and the other half were affected by HIV – they had an adult child living with HIV or one who had died due to AIDS-related illness [24].

Data collection

The WOPS questionnaire and other data collection instruments were adapted from the WHO Study on global AGEing and adult health (SAGE)[33]. All instruments were pretested and piloted prior to use [24]. The components of the study questionnaire analyzed in this paper include:

1) *Socio-demographic characteristics:* age, sex, marital status, occupation, education level and household assets.
2) *Risk factors:* smoking and alcohol use, stressful events and sleep disorders, body mass index.
3) *Self-reported chronic conditions :* self-reported diagnoses of chronic conditions (including hypertension, diabetes mellitus, depression, stroke, angina, chronic obstructive pulmonary disease (COPD), arthritis, cataract/eye sight problems,
4) *Self-reported functioning:* objective measurements (weight, height, walking speed.

Information from the interviews and assessments was used to describe health states that included diagnoses, risk factors and impairments as described below. Disability was assessed using the 12-item version of WHODAS 2.0[32].

Diagnoses

Hypertension was diagnosed in one of two ways: (1) a self-reported diagnosis of hypertension, currently on treatment (participants were asked: Have you ever been told by a doctor or a health worker that you have raised blood pressure? If yes, were you started on treatment and are you still on treatment?) and/or (2) Having a blood pressure reading assessed at the time of the survey as hypertensive by the World Health Organization/International Society of Hypertension criteria (systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg)(REF).

Diabetes mellitus, chronic obstructive pulmonary disease (COPD), and eyesight problems/cataracts: Prevalence estimates were based on self-report of a doctor's diagnosis (participants were asked: Have you ever been told by a doctor or a health worker that you have [condition]? If yes, were you started on treatment and are you still on treatment?).

Stroke and angina: Prevalence for these two conditions were determined through algorithms using symptom-reporting [33].

Depression: Diagnosis of depression was based on a diagnostic algorithm, with participant responses scored using M.I.N.I. criteria [34-36]. Screening questions for a major depressive episode were asked (For the past two weeks, were you depressed or down, most of the day, nearly every day? In the past two weeks, were you much less interested in most things or much less able to enjoy the things you used to enjoy, most of the time?) If participants answered yes to these questions, they were further asked a number of questions to ascertain major depressive episode.

Arthritis: Participants were first asked if they had ever been diagnosed/told you have arthritis. If yes, they were further asked about medication use or any other treatment for arthritis in the last 2 weeks and the last 12 months,

and about symptoms, such as if they had experienced aching, stiffness or swelling around the joints which were not related to injury and lasted for one month). Prevalence was determined through using a diagnostic algorithm[33].

Risk factors

Risk factors included tobacco use (if participants were using tobacco and if yes the duration), the method of consumption (whether they were smoking or using chew or snuff) and the quantity of tobacco consumed on each of the previous seven days. Alcohol use was determined by asking whether participants had ever/were currently consuming alcohol, the duration, and the types of alcohol consumed. This analysis focused on ever use and current use of tobacco and alcohol. Body Mass Index (BMI) was determined from weight and height measurements taken at the time of the survey.

Disability

The 12-item version of WHODAS 2.0 was used in the interview [37-39], includeing questions in six domains : cognition, mobility, self-care, getting along, life activities and participation. WHODAS asks about difficulty in these domains during the 30 days preceding the interview. The possible responses for each question were on a 5-point scale: "none", "mild", "moderate", "severe", and "extreme or cannot do". An algorithm was used to compute an overall WHODAS score for each respondent, with a higher score indicative of greater level of disability [37].

Ethical issues

Ethical approval to conduct this study was obtained from the Uganda Virus Research Institute Science and Ethics Committee, the Uganda National Council for Science and Technology and WHO's Ethical Review Committee.

All participants gave a written/thumb-printed consent to participate in the study.

Statistical methods and data analysis

All analyses were conducted in Stata 13. All descriptive statistics and sample sizes are presented as unweighted values, with a p-value of <0.05 considered statistically significant.

All analyses are stratified by HIV status, including descriptive statistics for each of these measures: socio-demographic variables (gender, locality, employment status, marital status and highest level of education), chronic conditions (angina, arthritis, diabetes, COPD, depression, eye problems, hypertension and stroke) and risk factors (ever/current use of tobacco and alcohol, sleep problems, ART use conditional on HIV status, mean age and mean BMI). Chi-squared statistics highlight whether there are significant differences across chronic conditions and risk factors between those infected and affected by HIV. Median differences in age and BMI were calculated for the two respondent groups due to these data not being normally distributed. Wilcoxon rank-sum analyses were used to compare median differences in age and BMI for the two respondent groups.

For each respondent group, mean WHODAS 2.0 scores were determined for each chronic condition. T-test analyses were run within each respondent group to compare WHODAS scores for those with or without a chronic condition diagnosis.

Linear regression analyses were used to determine existing associations between socio-demographic factors, chronic conditions, and risk factors to WHODAS scores. Bivariate analyses first determined significant main effects as well as interaction terms between HIV status and other factors before a

multiple linear regression with these variables was undertaken. For this analysis, a robust regression analysis was used.

Results

Sociodemographic characteristics of study participants

Sociodemographic characteristics of the study population by HIV status are provided in Table 1. In total, 471 participants were included with median age of 63 (50-101). The majority of the sample were women (62.6%), widowed, still working and had less than primary school education. Due to the sampling strategy, about half of the study participants (51.8%) were HIV infected. The HIV positive respondents tended to be younger. Only about 10% of older persons living with HIV were aged 70 or older; over half of the HIV negative sample was in the older age groups. Locality differences by HIV status are largely due to the sampling strategies described above.

Proportion of chronic conditions by HIV status

Several differences in the proportion of chronic conditions were evident between the two respondent groups (Table 2). When comparing by age, significant differences were present for COPD, eye problems, hypertension and multimorbidity. When comparing by HIV status, the same conditions were significantly different as seen for age, plus angina and diabetes. Furthermore, a significantly higher proportion of HIV negative respondents than HIV positive respondents reported more than one condition (not including HIV) (, respectively). Reported multi-morbidity of chronic conditions was higher among HIV negative than HIV positive respondents.

Risk factors by HIV status

Several significant differences in the proportion of risk factors by HIV status were also evident. BMI was higher for HIV negative respondents compared

to those who were HIV positive. This however may be a result of HIV status rather than a risk factor. A higher proportion of HIV negative respondents said they currently consumed both tobacco and alcohol compared to HIV positive respondents. A higher proportion of HIV negative respondents also experienced mild sleep problems as compared to HIV positive respondents.

Linear regression of WHODAS scores

Tables 2 and 3 show that there are several significant differences in the proportion of chronic conditions and risk factors between HIV positive and HIV negative respondents. These reached significance in bivariate analyses, however when controlling for all other variables in the full linear regression model, many were shown to not have a relationship to WHODAS scores including current tobacco use, HIV infection and arthritis diagnosis. Table 4 shows the factors that were significantly associated with WHODAS. A diagnosis of depression was associated with a 9.4 point increase in the WHODAS score, meaning a significant increase in disability compared to respondents who were not diagnosed with depression. A one year increase in the age of the respondent was significantly associated with an almost one unit increase in WHODAS score. Gender was also a significant factor relating to WHODAS scores with women having higher scores (14.5; CI xxx-xxx). Several risk factors either aggravated or protected against disability. Having a sleep problem of any type was significantly associated with higher WHODAS scores, with the more severe the sleeping problem, the higher the score. Conversely, current alcohol consumption was associated with lower levels of disability (lower WHODAS scores). Respondents who had not consumed any alcohol in the past 30 days were associated with an average 4.7 points higher WHODAS scores than current drinkers.

Discussion

This study examines HIV status and chronic conditions in Ugandans aged 50 years and over. A higher proportion of HIV negative respondents than HIV positive respondents reported certain chronic diseases, multiple chronic conditions, and risk factors like alcohol and tobacco consumption. It was only COPD that was proportionally more likely to be reported by HIV positive older adults compared to HIV negative older people.

A study conducted in rural areas of three African countries showed that alcohol consumption and tobacco smoking were significantly higher in older men and women aged 50 years and over than in those aged under 50 years [8]. Because the majority of these risk factors are related to individual health behaviors, most are potentially amenable to behavioral interventions [26].

While health behaviors and individual factors increase risk, it is also important to note that a majority of older persons in low-income countries are poor and have access to limited health resources. For example, poor living conditions are a major risk factor for chronic respiratory diseases [27, 28]. Further, in many LMICs, due to poverty and mobility issues, older persons are unable to seek medical attention for early detection and treatment of these chronic conditions even if they recognize symptoms or have knowledge that the condition is treatable [29]. Thus it is important to highlight the need for health service and structural changes as well, as lack of available services contributes significantly to the quality of life of those living with chronic conditions [19].

Within African settings, we only know of a few cohorts (one in Uganda and two in South Africa) which are looking at the direct and indirect effects of HIV on the health and wellbeing of older people [24, 40, 41]. There are not very many studies within the African settings with which to compare our study findings; however, this trend of more chronic infections in HIV

uninfected older adults was also observed in the WOPS1 data in both Uganda and a comparable study from South Africa. In data from both countries, the lower prevalence of hypertension in HIV infected older adults was particularly striking [24].

When we looked at disability using WHODAS2.0 scores, sleep problems and depression were significant factors that related to higher scores (more disability). These are arguably some of the most underserved illnesses in health facilities at lower levels, particularly for older adults. This calls for a greater focus on mental health, and investigations into why these issues exist among older Ugandans. Some of the reasons that have been previously cited for poor mental health among older Africans include lack of social connection, family support, HIV stigma and caregiving burden (ref). There is also need to examine best practices to treat mental health issues in older people at lower levels of the health care systems or through community-based interventions in Uganda.

Confirming findings from WOPS1 [24], women had significantly higher disability scores than men. It is unclear why older women have higher disability scores than men since there is evidence that adult women generally have better health seeking behavior compared to men [42-44]. However, there is evidence that older African women report poorer self-rated health and quality of life than men, both of which are associated with disability [41, 45]. This relationship could be related to various aspects of the home and social life, including older women's care giving responsibilities and the interrelationship between mental and physical health [46-48]. The underlying reasons for older women having significantly higher disability scores than older men needs further research. Other risk factors seemed to have inverse of the expected relationships—higher alcohol and tobacco use was associated with less disability. One possible explanation may be that those lower levels of disability increase one's ability to access alcohol and

tobacco. Given the preponderance of evidence of the role of alcohol, tobacco and diet in chronic conditions in high-income countries [add cites], it will be important to track these relationships over time.

This study has potential strengths and weaknesses. There are very few studies in Uganda and indeed sub-Saharan Africa that examine the direct and indirect effects of HIV on the health and wellbeing of older people. This study provides initial data on chronic conditions, including the prevalence of the risk factors and the association between chronic conditions and disability, in older people living with HIV and those not infected by HIV.

One limitation of these data is that most of the diagnoses made were by self-report. Though these may not be as accurate as diagnoses made by clinicians, diagnoses by self-report have been widely used in other studies [10, 31, 33]. It will be important to continue to explore and validate self-reports of various health conditions and behaviors against more objective measures in these and other data from sub-Saharan Africa. In future studies it would be advantageous to expand the covariates to include other social or health factors that can be associated with WHODAS scores. Lastly, because of anticipated mortality and loss to follow up in the original sample of WOPS1 we added 100 respondents who were HIV positive in the WOPS 2 sample. These new respondents might be different in a number of ways from the original WOPS 1 sample, and from other HIV positive individuals living in Uganda, as they were identified through a non-governmental organization that serves people living with HIV.

In conclusion, this study has identified a number of factors, like sleep problems and depression, and COPD among HIV positive individuals, which are associated with high disability scores among older Ugandans. Unfortunately, in most of the lower level health centers in Uganda, which are the first levels of care for most of the older people, such factors are

underserved. As the population of Uganda ages, with and without HIV, there is need to revise Ugandan health policy to consider the health needs of older people. Focusing on community and health services interventions that positively impact *both* physical and mental health are likely to reduce disability and improve overall quality of life among older Ugandans.

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Tables

Table 1. Sociodemographic characteristics, by HIV status

Demographics	HIV+ (N=244)		HIV- (N=227)	
	N	%	N	%
Gender				
Male	97	39.8	79	34.8
Female	147	60.3	148	65.2
Age				
50-59	135	55.3	33	14.5
60-69	82	33.6	69	30.4
70-79	23	9.4	82	36.1
80+	4	1.6	43	18.9
Locality				
Urban	64	26.2	105	46.3
Rural	73	29.9	120	52.9
Masaka	107	43.9	2	0.9
Marital status				
Never married	3	1.2	9	4.0
Cohabitating/married	77	31.6	70	30.8
Divorced/separated	57	23.4	49	21.6
Widowed	107	43.9	99	43.6
Current employment status	*(n=241)*		*(n=226)*	
Still working	213	88.4	166	73.5
No longer working	28	11.6	60	26.6
Education level	*(n=242)*		*(n=)*	
No formal education	35	14.5	53	23.5
Less than primary	96	39.7	113	50.0
Completed primary	43	17.8	16	7.1
Incomplete secondary	40	16.5	16	7.1
Completed secondary	15	6.2	14	6.2
Higher education than secondary	3	1.2	6	2.7
College/university or more	10	4.1	8	3.5

Table 2. Proportion of chronic conditions by HIV status

	50-59 (N=168)		60-69 (N=151)		70+ (N=152)		P value by Age	P value by HIV status
	HIV+ (N=135)	HIV- (N=33)	HIV+ (N=82)	HIV- (N=69)	HIV+ (N=27)	HIV- (N=125)		
Hypertension								
Yes	23.7%	48.5%%	30.5%	27.5%	33.3%	56.8%	*0.00*	*0.00*
Diabetes								
Yes	2.2%	9.1%	0.0%	8.7%	3.7%	8.1%	0.287*	*0.001**
Arthritis								
Yes	6.7%	9.1%	6.1%	2.9%	7.4%	4.9%	0.743*	0.316
Angina								
Yes	0.9%	0.0%	1.4%	5.2%	0.0%	4.8%	0.225*	*0.05**
COPD								
Yes	10.4%	3.0%	7.3%	1.5%	3.7%	1.6%	*0.026**	*0.002**
Eye problems								
Yes	4.4%	3.0%	4.9%	7.3%	18.5%	16.1%	*0.001**	*0.017*
Depression								
Yes	12.6%	3.0%	8.5%	7.3%	7.4%	7.2%	0.464	0.114
Stroke								
Yes	1.5%	3.0%	1.2%	0.0%	3.7%	4.0%	0.140*	0.533*
Number of conditions								
None	52.6%	42.4%	51.2%	55.1%	55.6%	28.0%	*0.00**	*0.004**
One	44.4%	57.6%	47.6%	44.9%	33.3%	67.2%		
More than one	3.0%	0.0%	1.2%	0.0%	11.1%	4.8%		

*Fisher's exact test used due to small cell size

Ordered logistic regression of number of chronic conditions

Independent variable	OR (95% CI)	P value
HIV Status		
*Positive**		
Negative	1.4 (0.9 - 2.2)	0.149
Gender		
*Male**		
Female	1.6 (1.1 - 2.3)	*0.024*
Age group		
*50-59**		
60-69	0.9 (0.5 – 1.4)	0.538

	70+	2.1 (1.2 - 3.6)	*0.006*
Locality			
	Urban*		
	Rural	0.5 (0.4 − 0.8)	*0.005*
	Masaka	1.0 (0.6 − 1.8)	0.982

Table 3. Risk factors by HIV status

	HIV + (N=244)		HIV- (N=227)		P value
	N	%	N	%	
Ever used tobacco?			(n=)		
Yes	75	30.7	77	33.9	0.460
No	169	69.3	150	66.1	
Current user of tobacco?	*(n=75)*		*(n=77)*		
Yes	16	21.3	37	48.1	<0.001
No	59	78.7	40	51.9	
Ever consumed alcohol?			*(n=)*		
Yes	198	81.2	171	75.3	0.126
No	46	18.9	56	24.7	
Currently consume alcohol	*(n=198)*		*(n=171)*		
Yes	59	29.8	74	43.3	0.007
No	139	70.2	97	56.7	
Sleep problems					
None	141	57.8	101	44.5	0.005
Mild	16	6.6	36	15.9	
Moderate	45	18.4	40	17.6	
Severe	28	11.5	35	15.4	
Extreme	14	5.7	15	6.6	
On ART?	*(n=212)*				
Yes	192	90.6			
No	20	9.4			
				z score	
Median age	57		71	-11.5	<0.001
Median BMI	21.4		22.7	-4.0	0.001

Table 4. Linear regression of WHODAS scores

Independent variable	Coefficient (95% CI)	P value
Arthritis diagnosis		
*No**		
Yes	-1.2 (-9.9 – 7.6)	0.795
Depression diagnosis		
*No**		
Yes	9.4 (1.2 – 17.7)	0.025
COPD diagnosis		
*No**		
Yes	6.6 (-2.2 – 15.4)	0.139
BMI	0.3 (-1.1 – 0.8)	0.152
Age	0.98 (0.7 – 1.2)	<0.001
HIV status		
*Negative**		
Positive	-6.3 (-15.8 – 3.1)	0.187
Gender		
*Male**		
Female	14.5 (7.8 – 21.2)	<0.001
HIV status/hypertension diagnosis		
HIV-/no diagnosis	-1.6 (-8.0 – 4.7)	0.605
HIV+/no diagnosis	3.4 (-3.2 – 9.9)	0.314
HIV status/gender		
HIV+/Female	-6.8 (-15.5 – 1.8)	0.120
Current alcohol consumption		
*Yes**		
No	4.7 (0.2 – 9.3)	0.04
Sleep problems (last 30 days)		
*None**		
Mild	14.2 (7.3 – 21.0)	<0.001
Moderate	16.9 (10.8 – 23.0)	<0.001
Severe	20.3 (13.9 – 26.7)	<0.001
Extreme/can't do	21.7 (11.4 – 31.9)	<0.001
Currently employed		
*Yes**		
No	6.8 (-0.2 – 12.3)	0.06

*reference category