

Chronic Co-morbidity and Self-management Skills Among Adult HIV Patients in Ethiopia

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Abstract

Background: HIV requires life-long adherence to treatment and diet, also to avoid chronic co-morbidity. Self-management is widely recognized as an essential part of care for people with chronic disease. We aimed to quantify the prevalence of co-morbidity among adult HIV patients and their self-management skills.

Methods: An institutional based cross sectional study was conducted from May to June 2019. We selected a total of 520 adult HIV patients, attending antiretroviral therapy clinics in three Hospitals in Southern Ethiopia. Data were collected at routine care consultations by nine trained nurses using a pre-tested structured questionnaire.

Result: The mean age of the study participants was 38.7 ± 9 years. Prevalence of diabetes and Hypertension was 1.5% and 9.4%, respectively. Being older, overweight, and obese was significantly associated with chronic comorbidity. The total score of HIV Self-management was 42 ± 3.92 out of 60. The least mean score (1.69 ± 0.9) was seen in the social support domain of HIV self-management.

Conclusion: The prevalence of diabetes and hypertension was relatively low in our population. Self-management skills seem to be low, but many aspects of self-management are poorly understood in Ethiopia (low-income) setting.

Introduction

According to recent statistics, globally 36.9 million people were living with Human Immunodeficiency Virus (HIV) in 2017, of which 19.8 million people came from East and Southern Africa [1]. Ethiopia is among the seriously affected countries in sub Saharan Africa, with a prevalence of 1.1% and 27,104 new cases in 2016 [2]. An increased coverage of Antiretroviral Therapy (ART), has brought substantial improvement of survival among people living with HIV [3]. HIV disease requires lifelong therapy and it became a risk factor for additional chronic diseases, such as cardiovascular diseases and diabetes [4–6]. Almost half of the HIV patients with multiple chronic conditions report several limitations in their daily lives and are more likely to have a decline in self-reported health [5, 7]. Therefore, more and more attention is being paid to the issue of multi-morbidity in HIV disease and the fact it could overpower health-care systems, especially in resource-limited regions that lack the infrastructure to organize chronic care [6].

An increasing burden of chronic diseases is becoming one of the greatest challenges that health care systems are facing globally [8]. An increase in complexity and fragmentation of chronic care is reported by both patients [9, 10] and health care providers [11, 12]. Patients with multiple chronic diseases experience unfavorable health outcomes and give rise to challenges in patient care and medical costs [13]. Clear evidence suggests that people with multiple chronic conditions utilize greater health care resources, than those who have fewer conditions and the costs are even up to seven times higher compared to those patients who have only one chronic condition [14]. When chronic diseases began to

emerge, patients, health professionals, and health services had to play new roles [15]. When health care systems shift from acute to chronic care, a self-management model is needed in which the patient has an active and informed role in healthcare decision-making [16]. Since patients spend most of their time away from medical facilities they have to manage care activities on a daily basis [17].

Self-management is defined as the day-to-day tasks that a patient undertakes to monitor and manage condition-related symptoms, adhere to treatment and adapt to a healthy lifestyle, in order to achieve overall well-being and a satisfying life [18]. Self-management is regarded as the best practice to improve clinical care and outcomes and can also reduce burden on healthcare system resources and capacities for chronic diseases by enhancing patient's own effectiveness and self-determination [19–23]. Programmes of chronic care that encouraged self-management, have been shown to be effective in a range of chronic diseases [24–29]. The response of health systems to facilitate proper self-management is highly inadequate in low-income countries [30], although also in high-income countries optimal self-management support for chronically ill patients remains relatively underdeveloped and far from accomplished [31].

Existing studies on chronic comorbidities among HIV patients in Ethiopia had a small sample size [32–34]. Self-management is a complex phenomenon that has not been well researched in HIV patients [35] and therefore it is unclear what the degree of self-management is in people living with HIV in Ethiopia. When we gain more insight into chronic co-morbidity and self-management, it will help to bridge the gap between the needs of the patients and the care that is provided [36]. The aim of this research was to quantify the magnitude of chronic co-morbidity among adult HIV patients and their self-management skills in Ethiopia.

Methods And Material

Study design, period and setting

An institutional based cross sectional study was carried out in three selected hospitals from May to June 2019. Hawassa University Comprehensive Specialized Hospital (HUCSH) is a tertiary level hospital which delivers specialized and referral service for the General Hospitals. Adare and Yirgalem Hospitals are General Hospitals that deliver secondary level healthcare [37]. HUCSH and Adare General Hospitals are found in Hawassa Town, the capital of Southern Nation Nationalities People Region of Ethiopia and is located 275 km south of Addis Ababa, Capital of Ethiopia. The other, Yirgalem General Hospital, is located 47 km southeast of regional capital Hawassa. At the beginning of this study (May 7, 2019), HUCSH, Adare and Yirgalem General Hospital gave ART service for 2553, 1821 and 1476 adult HIV patients' respectively.

Population, sample size and sampling technique

All adult HIV patients with age ≥ 18 years, attending the ART clinic in this period were eligible for this study. Those adult HIV patients who were pregnant and lactating were excluded from the study. The formula for single population proportion was applied to compute the optimal sample size for estimating the number of HIV patients needed for this study. Prevalence of hypertension among HIV patients, (12.7%) was taken from the study conducted in Eastern Ethiopia [32]. The computation was made with the inputs of 95% confidence level ($Z = 1.96$) and 3% margin of error (d). For the sake of accommodating possibilities of non-response 10% contingency was added. Accordingly, the calculated sample size was 520 participants. A proportionate sample was determined, and thus, 227 participants were targeted from HUCSH, 162 participants from Adare general hospital, and 131 from Yirgalem general hospital. All participants who fulfil the criteria and voluntarily agreed to take part in the study were included.

Data collection methods and procedures:

Nine data collector clinical nurses and three supervisors were trained on data-collection methods for three days and data were collected at routine care consultations. The questionnaire was designed to capture sociodemographic, health, behavioral, physical activity, and nutrition related characteristics of the study participants, and it was prepared in English first and translated to Amharic language, then retranslated into the original version to check for the consistency. To collect data on dietary diversity and household food insecurity; the Household Dietary Diversity Score (HDDS) of food and nutrition technical assistance indicator guide [38] and Household Food Insecurity Access Scale (HFIAS) [39] were used, respectively. Weight was measured using a calibrated digital Seca® scale and recorded to the nearest 0.1 kg. Height was measured using a stadiometer by positioning the patient at the Frankfort plane to the nearest 0.1 cm. All anthropometric measurements were taken twice, the average of the two observations was registered. Normal weight and underweight were defined as BMI, 18.5–24.99 kg/m² and ≤ 18.5 kg/m², respectively, whereas overweight and obesity were defined as BMI, ≥ 25 and 30 kg/m², respectively [40].

The random blood glucose was determined by using glucometer-strip method by finger puncture. According to the American Diabetes Association's guideline, a random blood glucose level < 140 mg/dl was considered as normal, 140–199mg/dl as impaired glucose regulation and ≥ 200 mg/dl defined as diabetes [41]. Whenever the random blood glucose level indicated a case of diabetes (≥ 200 mg/dl) or impaired glucose regulation (140–199mg/dl), it was confirmed by measuring fasting blood glucose levels. Resting blood pressure (BP) was measured with an automated sphygmomanometer. The BP reading was consistently taken from the left arm, three times at 5 min interval. The average of the two last readings was calculated and used in the analysis. High BP (hypertension) was classified as a BP of $\geq 140/90$ mmHg. Participants who were unaware of the fact that they had diabetes and/or hypertension were linked to the respective hospital for further diagnosis and management of their conditions.

To assess self-management in HIV patients, the HIV Self-management Scale was used [42, 43]. The HIV Self-Management Scale consists of 20 items relating to three domains. The domains consist of 12 items with daily self-management health practices (e.g. “Staying physically active is an important part of my HIV self-management strategy”); 3 items with social support of HIV self-management (e.g. “Attending

support groups is an important part of my HIV self-management strategy”); and 5 items on chronic nature of HIV self-management (e.g. “I have accepted that HIV is a life-long condition that can be managed”). Each item is scored on a 0–3 scale: 0 = not applicable, 1 = none of the time, 2 = some of the time, and 3 = all of the time. Each domain is scored separately and divided by the number of items in that domain and the total score of the scale was calculated by summing items in all domains and the possible score thus ranged from 0–60.

Data Management and Analysis

Data were entered, cleaned, coded and analyzed by using SPSS for Windows version 20.0 (IBM, USA). In the analysis: proportions, frequencies, and means were calculated. All the independent variables with $p < 0.25$ during bivariate analysis were included in the multivariate model. The Hosmer and Lemeshow goodness of fit test was used to determine whether the model adequately described the data and the model adequately fitted for the final model. Adjusted odds ratio (AOR) with 95% CI was estimated to assess the presence and strength of associations, and statistical significance was declared at a p -value ≤ 0.05 .

Results

Socio demographic and health characteristics of study participants

A total of 520 patients were included in the study, with a response rate of 100% of those invited. The mean age of study participants was 38.7 (± 9.01) years. Most patients were female (63%), single (63%), and had a tertiary level of education (27%). Most patients were orthodox Christians (51%), urban residents (94%), and private employed (30%). Most patients (60%) had a family size ranging from 3–6, and half of them (50%) had a low income [Table 1].

Table 1
Socio demographic characteristics of adult HIV patients in selected Hospitals of Southern Ethiopia, 2019
(N = 520).

Variable	Number	Percent
Sex		
Male	191	37
Female	329	63
Age		
< 20	9	2
21–30	94	18
31–40	236	45
41–50	128	25
51–60	53	10
Marital status		
Single	233	63
Married	89	17
Divorced	98	19
Widowed	100	19
Education level		
No formal education	55	11
Primary education	131	25
Secondary education	194	37
Tertiary education	140	27
Religion		
Orthodox	263	51
Muslim	80	15
Protestant	171	33
Others	6	1
Place of residence		
Private Employee=A person who works for a private employer or in private organization and receives regular remuneration in salary.		

Variable	Number	Percent
Urban	487	94
Rural	33	6
Occupation		
Government employee	111	21
Private employee	156	30
Daily-laborer	58	11
House wife	13	3
Merchant	78	15
Others	104	20
Family members		
< 3	153	29
3–6	310	60
≥ 7	57	11
Income level (Ethiopian Birr/month)		
Low (< 1500)	262	50
High (≥ 1500)	258	50
Private Employee=A person who works for a private employer or in private organization and receives regular remuneration in salary.		

Out of 520 patients, most (99%) of them had already started ART, and the remaining six (1%) were new, came to start ART for the first time. Most of the patients (92%) were categorized as WHO clinical stage one, had CD4 count \geq 500 (58%), and had been on ART for more than 24 months (71%). Most (54%) patients did not practice regular physical exercise, but alcohol consumption (88%) and cigarette smoking (99%) were low. The majority had normal BMI (59%), but low dietary diversity score (55%) and high food insecurity (77%) [Table 2].

Table 2
Health related characteristics of adult HIV patients in selected
Hospitals of Southern Ethiopia, 2019 (N = 520).

Variable	Number	Percent
WHO clinical stage		
Stage I	478	92
Stage II	19	4
Stage III	18	3
Stage IV	5	1
ART regimen started		
AZT-3TC-EFV	87	17
AZT-3TC-NVP	93	18
TDF-3TC-EFV	268	52
Others	72	14
Duration of ART		
< 24	149	29
≥ 24	371	71
CD4 count(only available for 450 patients)		
< 200	45	10
200–349	65	14
350–499	77	17
≥ 500	263	58
Regular physical exercise		
Yes	242	47
No	278	53
History of alcohol consumption		
Yes	64	12
No	456	88
History of cigarette smoking		
Yes	7	1

Variable	Number	Percent
No	513	99
BMI(N = 520)		
Underweight (< 18,5)	77	15
Normal weight (18,5–24,9)	307	59
Overweight (25–30)	100	19
Obese (> 30)	36	7
Dietary diversity score		
Low	285	55
High	235	45
Household food security		
Secured	117	23
Insecure	403	77

Chronic co-morbidity status of the study participants

The prevalence of diabetes and hypertension was 1.5% and 9%, respectively. The very few cases of diabetes seemed to be distributed rather equally across different subgroups. Hypertension seemed to concentrate among the older and higher educated patients (Table 3).

Table 3
Chronic comorbidity among adult HIV patients in selected Hospitals of Southern Ethiopia, 2019.

Variable	Chronic comorbidity	
	Hypertension(N = 49)	Diabetes(N = 8)
Sex		
Male	24(49)	3(38)
Female	25(51)	5(62)
Age		
21–30	5(10)	0(0)
31–40	11(23)	1(12)
41–50	24(49)	3(38)
51–60	9(18)	4(50)
Education		
No formal education	5(10)	1(12)
Primary education	10(20)	2(25)
Secondary education	20(41)	3(38)
Tertiary education	14(29)	2(25)
Occupation		
Government employee	14(29)	0(0)
Private employee	10(20)	5(63)
Daily-laborer	6(12)	1(12)
Merchant	9(19)	2(25)
Others	10(20)	0(0)
Regular physical exercise		
Yes	22(45)	4(50)
No	27(55)	4(50)
Duration of ART		
< 24 months	17(35)	2(25)
≥ 24 months	32(65)	6(75)

Determinants of chronic comorbidity among adult HIV patients

In the bivariate analysis age, income level, BMI, household food security, dietary diversity score and self-management were factors associated with chronic comorbidity. Being older and BMI value of 25 kg/m² and above were significantly associated during multivariable logistic regression analysis. The odds of having chronic comorbidity among HIV patients was four times and eight times higher in age groups between 35 and 54 years [AOR = 3.54, 95% CI: (1.46, 8.74)] and 55 + years [AOR = 7.66, 95% CI: (2.29, 25.50)] respectively, compared to younger adults. Compared to those who had BMI < 18.5 kg/m² (underweight) and between 18.5 kg/m² and 24.5 kg/m² (normal), the odds of having chronic comorbidity was 3 times higher [AOR = 2.82, 95% CI: (1.00, 7.93)] than those having BMI greater than or equal to 25kg/m² [Table 4].

Table 4
Factors associated with chronic comorbidity among adult ART patients of public hospital in south Ethiopia, 2019.

Factor variable	Chronic comorbidity		COR(95% CI)	AOR(95% CI)
	Yes (N)	No (N)		
Age				
18–34®	6	155	1	1
35–54	42	283	3.83(1.59, 9.22)	3.57 (1.46, 8.74)*
55 +	7	27	6.69(2.09, 21.46)	7.66 (2.29, 25.50)*
Income level				
Low ®	22	240	1	1
High	33	225	1.60(0.91, 2.83)	1.11(0.59, 2.06)
BMI				
<18.5	5	73	1	1
18.5–24.9	25	279	1.31 (0.48, 3.54)	1.02 (0.36, 2.84)
25+	25	113	3.23 (1.18, 8.82)	2.82 (1.00, 7.93)*
Household food security				
Food secured®	19	98	1	1
Food insecure	36	367	1.98 (1.09, 3.59)	1.94 (0.99, 3.78)
Dietary diversity score				
Low ®	26	259	1	1
High	29	206	1.40 (0.80, 2.46)	1.27 (0.68, 2.38)
Self-management				
Low ®	37	368	1	1
High	18	97	1.85(1.01, 3.38)	1.39 (0.69, 2.80)
* Statistically significant variables in multiple logistic regressions at p-value ≤0.05 ® Reference category				

Self-management status of the study participants

On a scale from 0 to 60, the total self-management score was 42 ± 3.92 , it indicates the sum of the three domains, namely the daily self-management health practices, social support, and chronic nature of HIV. Self-management scores were different for the separate domains of the questionnaire, and each domain was scored separately by taking the mean of all the items in that domain. Accordingly, the mean score for daily self-management health practices was 2.09 ± 0.57 , the social support score was 1.69 ± 0.92 , and the chronic nature of HIV score was 2.68 ± 0.43 (Table 5). The low score in the social support domain group was mainly due to the two questions about social support groups, which are not very customary in Ethiopia.

Table 5
The mean result of each domain of self-management among adult HIV patients in selected Hospitals of Southern Ethiopia, 2019 (N = 520).

HIV self-management outcomes	Mean (\pm SD)
Domain 1(daily self-management health practices)	2.09(0.57)
Domain 2(social support and HIV self-management)	1.69(0.92)
Domain 3(chronic nature of HIV self-management)	2.68(0.43)

Discussion

The study was conducted with the aim of determining chronic comorbidity and self-management skills among adult HIV patients. In the present study prevalence of hypertension and diabetes mellitus (chronic comorbidities) among adult HIV patients was lower. Being older, overweight, and obese was shown to be significantly associated with chronic comorbidity. The total score of self-management was lower, and the lowest mean score was observed in the second domain, social support, and HIV self-management.

The estimated prevalence of hypertension in the present study was 9%, which is lower than studies conducted among HIV-positive patients of other parts of Ethiopia, Wolaita (15.9%), Jimma (34%), and Harar (12.7%) [32–34]. It is also lower than the finding from Uganda (27.9%) [44]. The possible reason for our relatively low hypertension prevalence could be the high percentage ($65\% \leq 40$ years old) of young people among our study participants. In addition to age, duration of therapy, type of ART, and lifestyle of participants could be important contributing factors for the discrepancy. To address this, further research should be done with a longitudinal study design.

In the present study, we also observed a lower prevalence of diabetes (1.5%) compared to studies conducted among adult HIV patients of Harar, Jimma, and Wolaita which were, 7.1%, 6.4 %, and 8%, respectively [32–34]. But it is comparable with other studies conducted in South Africa (1.3%) and Kenya (1.5%) [45, 46]. The observed difference could be due to variations in age distribution or duration of treatment of the study participants. Further research with a longitudinal study design is needed to understand the reason for this discrepancy.

In our study, chronic comorbidity was more prevalent among older HIV patients, which is in line with the study conducted in northern Ethiopia, Zambia, and Denmark [47–49]. Chronic comorbidity was seen more among overweight and obese participants than normal weight and underweight participants, which is in agreement with studies conducted in Nigeria and Botswana [40, 50]. It was also supported by a systematic review and meta-analysis reports of prospective cohort studies on comorbidity related to obesity and overweight, which indicates a significant association between the incident of chronic comorbidity with overweight and obesity [51]. HIV management programs should consider the health consequences of overweight and obesity and should strengthen weight management programs as a part of routine HIV care.

In the current study, the total score of HIV self-management was lower than the one conducted by Webel et al in the US [52]. There are some elements where people scored low self-management practice than others, like attending support groups as an important part of their HIV self-management strategy and helpfulness of educating others about HIV to stay in control of HIV. Even though sub-Saharan African countries are areas which are bitten by the highest burden of HIV, self-management in this region is relatively a new concept and not well researched [35]. In addition, unlike the developed countries, chronic disease self-management programs, which are helpful to improve the self-management ability of PLWH, are not well-functioning [53–56]. This difference reminds the need to seek an urgent implementation program on HIV self-management to improve the self-management ability of people living with HIV in Ethiopia.

Our study showed that the second domain of the self-management scale, social support of HIV, had the lowest mean score (1.69 ± 0.92), which is in line with the study conducted in the Liangshan area of China [57]. A low score in this domain indicates that HIV patients receive little support from people close by since this domain includes concepts of social influence, social support, and collaboration with healthcare professionals [43]. The Studies conducted in South Africa and Uganda indicated that more social contact increased quality of life among people on ART [58, 59]. Another study also indicated that social support is an important aspect of disease self-management [60]. Social support has got a buffering effect against stressors by providing informational support, emotional support, companionship support, and instrumental support (including provision of specific services to reduce client needs) [61–63]. The current study area, Ethiopia is known for strong social relationship, which makes this study finding paradoxical. The high existence of stigma and discrimination among PLWH in the study area [64] could be the plausible reason for this finding. Implementation of mainstreaming activities on stigma and discrimination prevention should be given more emphasis and further research should be done with new scale on each domain.

As a strength of our study, we would like to mention the facts that our data collectors were nurses and had expertise in HIV management. They could assist the participants in understanding and completing the questionnaires, they observed while the participants were being challenged in understanding the different options in each item of the questionnaire. Specially, understanding the items of the self-management scale was reported to be challenging. Specifically, the difference between not applicable

and none of the time was difficult. This probably led to misunderstanding of the questions and may have resulted in measurement bias. In addition, the data-collectors reported back that quite a few of the items were difficult to apply in an Ethiopian context. For example, attending social support group when they are overwhelmed and this might be because of fear stigma and discrimination. Therefore, we feel that developing a new questionnaire for self-management for low-income setting is needed.

Conclusion

In conclusion, low prevalence of chronic comorbidity and self-management skill was seen among adult HIV patients. Chronic comorbidity was high among HIV patients of older age and those with overweight and obese. Even though the social support domain is the most important part of HIV self-management, and the current study area is more known for strong social bondage, a low report was observed in this domain compared to others. To better assess the degree of self-management, there is an urgent need for a validated questionnaire and a new scale from scratch for the setting in Ethiopia and other low-income countries. There is a need for longitudinal studies to enhance understanding of the risk factors for chronic comorbidity among PLHIV.

Acronym And Abbreviation

AIDS: Acquired Immune Deficiency Virus, AOR: Adjusted Odds Ratio, ART: Antiretroviral Therapy, BMI: Body Mass Index, CI: Confidence Interval, COR: Crude Odds Ratio, HDDS: Household Dietary Diversity Score, DM: Diabetes Mellitus, HFIAS: House Hold Food Insecurity Access Scale, HIV: Human Immune Virus, HUCSH: Hawassa University Comprehensive Specialized Hospital, LMICs: Lower And Middle Income Countries, NCD: Non-Communicable Disease, SPSS: Statistical Package for The Social Sciences, WHO: World Health Organization.

Declarations

Ethical Consideration

To conform with the Declaration of Helsinki (1964) and Population Screening Act, ethical approval for the study was obtained from Hawassa University College of Medicine and Health Sciences Institutional Review Board (IRB/216/2019) on May 7, 2019. Permission was obtained from the hospital management. Participation was determined by the person without any external influence to participate or not. Before the data collection, informed written consent (signed or verified by fingerprint) was taken from the study subjects. The data were collected and analyzed anonymously.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

YT, SM, RT, BS, AT, MS, conceived and designed the study. YT obtained the data, analyzed and wrote original draft. YT, SM, RT, BS, AT, MS interpreted and critically revised the manuscript. All authors read and approved the final draft of the manuscript.

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