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FACTORS INFLUENCING ADHERENCE TO ARVS AMONG PATIENTS ATTENDING COMPREHENSIVE CARE CLINIC WITHIN JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, KIAMBU COUNTY, KENYA

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ABSTRACT

Background: The efficacy of anti-retroviral Therapy (ART) depends on adherence to the prescribed regimen. However, lack of adherence leads to treatment failure and drug resistance among other negative outcomes.

Objective: To determine factors influencing adherence to ARVS among patients attending the Comprehensive Care Clinic (CCC) within Jomo Kenyatta University of Agriculture and Technology (JKUAT).

Design: A descriptive cross sectional study.

Setting: Comprehensive Care Clinic within JKUAT.

Subjects: Three hundred HIV positive patients, undergoing ART treatment and follow up at the JKUAT clinic for a minimum duration of one month before the study, were recruited.

Results: Of the 300 patients enrolled for the study (70% females and 30% males), 81% were adhering to ARV treatment. The factors that were significantly associated with adherence included; Support (encouragement and reminder to take drugs) (P=0.025); the number of meals respondents took in a day (P = 0.001); pill burden (P = 0.002) and forgetfulness (P = 0.001). However, there was no significant relationship between adherence and age, marital status, education, employment status or time taken to travel to the clinic.

Conclusion: This study concluded that, the observed level of sub-optimal adherence to ART (19%) is of public health concern. These patients are vulnerable to treatment failure and development of resistant viral strains. Consequently the modifiable factors (Support, Number of meals taken, pill burden, and forgetfulness, should be addressed to change the current tread

INTRODUCTION

It has been nearly three decades since identification of the first case of HIV / AIDS. There are approximately 35 million people currently living with HIV and tens of millions of people have died of AIDS-related causes since the beginning of the epidemic (1). Sub-Saharan Africa continues to bear an inordinate share of the global HIV burden, though epidemics across countries in Africa vary considerably: 22.9 million people living with HIV / AIDS (PLWHA) live in the region, representing about 68 percent of the total worldwide (2). The epidemic is most severe in southern Africa, with South Africa having more people living with HIV (an estimated 5.6 million) than any other country in the world. Almost half of the deaths from AIDS-related illnesses in 2010 occurred in southern Africa (3). The vast majority of people in Africa who have HIV / AIDS are between the ages of 15 and 49, and millions of adults are dying young or in early middle age. AIDS-related mortality is increasing among 20 to 49 year olds (Adults in their most economically productive years) (4). In Kenya, HIV prevalence among adults aged 15 to 64 years decreased nationally from 7.2 to 5.6% as estimated by KAIS 2007 to 5.6% in 2012 (5). In the countries of Eastern Africa,

HIV prevalence began declining about a decade ago and has remained stable in many countries. In this region, the intensity of national epidemics varies from country to country, and heterosexual sex is the primary form of transmission (2). Prevalence in Kenya, Tanzania, and Uganda exceeds five percent (6.3%, 5.6%, and 5.4%, respectively) (6). HIV / AIDS can lead to poverty affecting particularly women and young people and can halt or reverse socio-economic development of a country (7). Over time, the pandemic can reduce the labour force and productivity, leading to declining welfare of the population and stagnation of the economy. An analysis of countries in Southern Africa found that a significant segment of the labour force has been lost due to HIV (8). People living with HIV are stigmatised leading to severe social consequences related to their rights, healthcare services, freedom, self-identity and social interactions. It also severely hampers the treatment and diagnosis of HIV contributing to further spread of the disease (9).

The DALYS (Disability adjusted life years) for HIV / AIDS in 2000 were estimated to be 44,329,000 for males and 46, 006,000 females (10). The international treatment guidelines indicate that optimal treatment for HIV involves a combination consisting of three different types of ARVs, which target the HIV life cycle at different stages. The most commonly used are from three classes: Nucleoside Reverse Transcriptase Inhibitor (NRTIs), Non- Nucleoside Reverse Transcriptase Inhibitor (NNR-TIs) and Protease Inhibitor (PI). Nowadays several ARVs are often combined in a single tablet, which usually ensures that patients always take multiple doses together (11). Non-adherence can lead to inadequate halting of the replication of the virus, continued damage to the immune system, progression of HIV infection to AIDS, and the development of drug resistance to ART medications (12). Barriers to adherence have been reported to vary from one country to another and even from one setting to another within the same country (13). This study aimed at determining the factors influencing adherence to ARVS among patients attending comprehensive care clinic at Jomo Kenyatta of Agriculture and Technology. The study is important to health policy makers with regards to prompt interventions and HIV and AIDS management.

MATERIALS AND METHODS

Study setting: The study was carried out at the Comprehensive Care Clinic, of the JKUAT, in Juja Township within Kiambu County. A total of 300 patients aged 18 years and above, and who had been on ART treatment at the Clinic for a minimum duration of one month before the study were recruited. Systematic random sampling was used to select every sixth patient that met the enrolment criteria. Semi structured questionnaires were used as data collection tools, while Focus Group Discussions were conducted for qualitative data. To estimate the proportion of adherence to ART, seven-day self-report was used. Data were analysed using SPSS, where descriptive statistics were used to describe the measures of central tendency and dispersion. Association between independent and dependent valuables was assessed using Chi-square. The level of interactions between dependent and independent variables was estimated using multiple logistic regression analysis. The dependent outcome variable was adherence to ARVs among patients visiting CCC at JKUAT. The independent variables included:-social-demographic characteristics, stigma, side effects associated with ARVs and knowledge on adherence. Statistical differences in parameter of estimates were deemed significantly different at P< 0.05.

RESULTS

Socio-demographic/socio-economic characteristics: The majority of the respondents (70%) were males, their ages ranged from 18 to over 60 years, and half of them (50.7) were employed (Table1).

Table 1
Socio- demographic/ economic profiles of the respondents

Socio-demographic/Socio- economic characteristic	All respondents (N = 300)	No (%)
Gender		
	Female	212 (70.0)
Age in years		
	18-20	11 (3.7)
	21-30	59 (19.7)
	31-40	125 (41.7)
	41-50	77 (25.7)
	≥51	28 (9.3)
Marital status		
	Single	72 (24.0)
	Married	148 (49.3)
	Divorced	6 (2.0)
	Separated	36 (2.0)
	Widowed	38 (12.7)
Education		
	No formal education	9 (3.0)
	Primary	138 (46.2)
	Secondary	105 (35.1)
	Tertiary	47 (15.7)
Employment status		
	Employed	242 (80.7)
Source of food		
	Purchase	272 (90.7)
	Household farm/garden	16 (5.3)
	Family support and others	12 (4.0)
Distance to the clinic		
	<10km	229 (76.3)
	≥10km	71 (23.4)
Transport to the clinic		
	By foot	86 (28.7)
	Public means	210 (70.0)
	Private means	4 (1.3)

Adherence to ARVs by respondents: Among all the respondents, (81%) reported that they had taken all their ARV drugs in the last seven days according to the instructions given at the clinic. Therefore result of this study indicated that of 81% of participants had optimal adherence while 19% had sub-optimal adherence. Out of 19% that missed part of their doses, 79% were females with 48% reporting that they had missed one dose, 44% had missed two doses and the remainder (8%) had missed three or more doses in the last seven days. Many of the respondents who missed ARV drugs (41.5%) said that, they simply forgot to take their drugs, 17.9% missed doses because of pill burden, 15.1% blamed it on busy schedules, 11.3%

said they missed drugs due to perceived stigma, others cited side effects and lack of stock (5.7% and 4.7% respectively).

Individual level factors: no social-demographic / social-economic variable was significantly associated with non-adherence. Most of the respondents (93.3%) knew that ARV treatment reduces the viral load and therefore slows progression to AIDS. However, no significant association was found between knowledge about ARVs and adherence ($\chi2$ =1.50566, df =4, P>0.05). Most of the respondents (78%) stated that they did not forget to take their medication as directed, 8% forgot to take the drugs at times while 14% reported that it was usual for them to forget their ARV medication. Respondents cited home duties, busy schedules, traveling, being away from home and social gathering (such as group meetings and weddings) as factors that led to forgetfulness. There was a significant association between forgetfulness to take ARVs and adherence ($\chi2$ =83.827, df = 2, P = 0.001).

Community level factors: Eighty six percent of respondents indicated that, they had disclosed their HIV status to someone. Of these disclosures, 71% were females. There was no significant association between disclosure of HIV status and adherence ($\chi2$ =0.004, df =1, P>0.05). The study observed that 40.1% of respondents suffered from stigmatisation, however, no significant association was established between stigma and adherence (P>0.05). The study established that majority of the respondents (68.7%) received support such as encouragement or reminder to take their medication. Out of those who received support, 73% were females. There was a significant association between support received by respondents and adherence to ART ($\chi2$ =5.041, df =1, P=0.025).

Factors related to ART treatment: Sixty percent of respondents stated that the number of times they could afford to feed in a day affected the way they took their medications while some respondents (16%) reported that taking medication was sometimes affected by the number of meals they took in a day. There was a significant association between the number of meals participants took in a day and adherence ($\chi2$ =32.936, df = 2, p = 0.001 < 0.05). Almost all the respondents (98%) stated that they would prefer a once per day regimen in order for them to be able to adhere to ARVS. The study established that a significant relationship existed between pill burden and adherence to ARVS ($\chi2$ =9.179, df = 1, p = 0.002). Respondents who took their ARV medication once per day adhered 89.7% against 75.1% who took ARV medication twice per day.

Multiple logistic regression: To test the effect of independent variables in the presence of other, a multiple regression model of the form, $\text{Log}(p/1-p) = B0 + B1^*x1 + B2^*x2 + B3^*x3 + B3^*x3 + B4^*x4 \ldots Bk^*xk + e$ was fitted to the data. Here p is the probability of adhering to the medicine. Using forward conditional method for automatic variable selection, table 2 gives the parameters for the valid model. Those who perceive ARV drugs not to be useful on their health are 5.38 times less likely to adhere compared to those who think otherwise. A person who is not forgetful of taking drugs is 11.07 times more likely to adhere compared to one who is forgetful. A PLWHA who can only afford one meal per day is 7.04 times less likely to adhere compared to one who can afford three meals (Table2).

Table 2
Logistic regression for variables among study participants

	Coding	B	S.E.	Wald	df	Sig.	OR
Drug effect	0->-not useful,						5.38
1->useful*		-1.681	.888	3.584	1	.050	
Memory				49.402	2	.000	
	1->Remember*						11.07
	0->sometimes	2.405	.539	19.907	1	.000	
	1->forget						
	0->sometimes	-.464	.588	.623	1	.430	
Meals				12.724	2	.002	
	1->1 Meal						7.04
	0->3 meals*	- 1.952	.547	12.724	1	.000	
	1->2 Meals						
	0->3 meals	-.554	.435	1.623	1	.203	
Constant		.556	.481	1.335	1	.248	

DISCUSSION

This study estimated patient adherence to ART by self-reports and found that 81% of the patients were ≥95% adherent to the prescribed regimen in the previous seven days. Higher levels of adherence have been reported from other studies. These include reports of 86% in Southern Nigeria (14). The level observed in this study is similar to reports of a self-reporting study in India which reported that 80% of patients had not missed a single dose in the last seven days (15). These various levels of adherence in different places might have been as a result of the fact that there is no gold standard by which adherence can be quantified (16). Moreover, adherence rates vary not just between individuals but within the same individual over time (17). In this study, forgetfulness, pill burden and being busy were the three commonly cited reasons for not taking medications. These findings are in agreement with those from Moi Teaching and Referral hospital, Eldoret, Kenya which reported that forgetfulness, being busy and pill burden contributed to poor adherence (18). In this study, forgetfulness may be explained by the fact that 80.7% of participants were employed and therefore had busy schedules.

Socio-demographic variables have not been shown to consistently predict ARV or other adherence to medication (19). In this study, no social-demographic variable was significantly associated with non-adherence. This finding could be explained by the level of independence and commitment respondents reported in this study. Focus group discussions showed that despite the numerous challenges faced by the respondents, they were committed to taking their ARV treatment for the sake of their health and need to care for their families. The efficacy of a drug is evaluated against its past performance. The study reported that PLWHAs "hope" on ART to improve their well-being motivated them to continue with ARV treatment. Therefore, there was a significant association between belief in the efficacy of the ARV drugs and adherence to ART. This belief was also reiterated by the Focus Group Guides which revealed that, a desire to be alive to support their families also motivated patients to adhere; this has been documented in other studies (20). Studies have indicated that disclosing one's HIV status helps to reduce stress and isolation with a consequent increase in social support and adherence (21). However, this study found no association between stigma/ disclosure and adherence to ARVs. One possible explanation for this finding could be due to the regular counseling sessions PLWHAs undertook in this study area may have become responsible and taken charge of their lives, therefore placing less value to stigma. Focus Group Discussion Guides revealed that, in spite of the challenges faced by respondents they had responsibilities such as: bringing up their children and therefore, taking their ARV medication was important.

Focus Group Discussions supported the observation that, there was a significant association between support received by respondents and adherence to ART. Similarly, social support has been found to be a correlate of adherence in developed countries (22) and has been reported as being an important facilitator in several qualitative studies in developing countries (23). This finding may be explained by the fact that social support did not only bring help to PLWHAs but also created a sense of responsibility towards their helpers and supporters. There was a significant association between the number of meals taken per day and adherence to ARVs. This could be due to the fact that majority of the respondents (92.3%) purchased food consumed in their households. In addition 14.5% of respondents were unemployed and majority of the respondents (55.5%) were on part time employment. This could mean that respondents had limited amount of money to spend on food. FGDs showed that many PLWHAs experienced side effects like dizziness and headache when ever they took their treatment on an empty stomach. This finding concurred with a study in Lusaka Zambia where HIV-patients used to skip treatment doses due to lack of food (24).

This study found a significant association between pill burden and adherence to ARVS. This could be explained by circumstances where by patients have to combine ART with treatment for opportunistic infections. Studies have shown that the higher the pill burden the lower is the adherence (25). A study carried out in Senegal, reported that three times a day therapy was the strongest predictor of poor adherence (26). The study showed a significant relationship between ability to follow instructions on ARV medication and adherence. This could be due to the information and attention respondents were getting from healthcare providers. The study established that respondents' needs for information, counseling and privacy were met. These findings agrees with (25), the specific needs and peculiar circumstances of PLWAS need to be given due consideration.

In conclusion, the level of sub-optimal adherence to ART found in this study (19%) is of concern. These patients are vulnerable to development of resistant viral strains. This study found out that, treatment-related factors such as lack of food, and respondents experience with pill burden were predictors of non-adherence. This study suggest that in addition to counseling, comprehensive interventions such as, training patients on medication about self-management skills and tailoring the regimen to the patient's lifestyle should be implemented. ART

programs should emphasise to patients on use of a support person or care partner as a means of improving the patient's level of adherence.

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