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Knowledge Levels of HIV Positive Patients on the Importance of Antiretroviral Therapy (Art) Adherence

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Abstract:*Globally, an estimated 33, 5 million (32, 2 million – 38, 8 million) people are living with HIV/AIDS and since the start of the epidemic around 75 million (63 million -89 million) people have become infected with HIV. According to the Central Statistical Office population projections of 2012, the current projected population of Zimbabwe is 12,7 million and Zimbabwe is among countries in Sub Saharan Africa heavily affected by the HIV/AIDS epidemic. According to the National AIDS Council of Zimbabwe (NAC), as of December 2012, Zimbabwe had a current HIV prevalence of 15% with an estimated number of 1 242 768 people living with HIV. Treatment adherence is a problem in chronic diseases and average non-adherence rate of 24, 8% has been reported with the highest rates in patients with HIV. Globally, non-adherence to antiretroviral therapy in adult HIV infected population ranges from 33% to 88%. The study utilised a quantitative descriptive design of non-experimental type. Roy'sAdaptation model was used to guide the study. The study was conducted at Parirenyatwa Group of Hospitals at the Opportunistic Infections clinic using a convenience sample of 30 HIV positive patients, aged between 20 and 50 years, who were on ART for at least six months, and were Shona (local language) or English speaking. Permission to carry out the study was obtained from the department of Nursing Science, the Joint Research and Ethics Committee and from the Clinical Director of Parirenyatwa Group of Hospitals. All participants gave informed consent prior to participating. Data was collected by a structured questionnaire. Twelve participants were male and 18 were female. Majority (40%) had been on art for more than 6 months . Majority (70%) participants had low knowledge, 10% had average knowledge while 20% had high knowledge of ART adherence. Nursing professionals and other health providers should educate HIV positive individuals on the importance of ART. They should reinforce on the importance of status disclosure to significant others to increase social support that improves adherence.*

I. Introduction

Globally, an estimated 33, 5 million (32, 2 million – 38, 8 million) people are living with HIV/AIDS and since the start of the epidemic around 75 million (63 million -89 million) people have become infected with HIV.[1]Sub Saharan Africa continues to be the most highly affected by HIV/AIDS, with 67% of all people living with the disease.[2] According to the Central Statistical Office population projections of 2012, the current projected population of Zimbabwe is 12,7 million and Zimbabwe is among countries in Sub Saharan Africa heavily affected by the HIV/AIDS epidemic. According to the National AIDS Council of Zimbabwe (NAC), as of December 2012, Zimbabwe has a current HIV prevalence of 15% with an estimated number of 1 242 768 people living with HIV.[3] There was an estimated number of 456 211 HIV deaths per year and 584 781 new HIV infections per year. Currently 657 178 people are in need of ART with 565 675 receiving it and as a result Zimbabwe has an ART coverage rate of 86, 1%. About 44% of HIV infected Africans are receiving ART .[4]

Today, ART has progressed from a single therapy to double therapy and finally to the current combination of HAART. This development was made so as to reduce the number of pills taken by the patient in order to improve adherence. This was borne out of the realization that adherence rates were inversely proportional to the number of pills necessary for treatment.[5] According to the essential drug list of Zimbabwe (EDLIZ) of 2011, the goals of ART are four fold namely maximal and durable suppression of replication of HIV , restoration and / or preservation of immune function , reduction of morbidity and mortality , and to improve the quality of life of HIV patients.[6] In the case of ART this implies taking the drugs in the right amounts, at the right time and following dietary and other lifestyle changes for the whole life. To obtain a successful treatment outcome the current regimen of HIV requires adherence levels above 95%.[7] Patient's knowledge and

information is not to be overlooked at when higher levels of adherence are to be achieved. A good level of understanding about HIV and awareness of consequences of non-adherence are associated with higher adherence levels. Therefore the purpose was to determine knowledge levels of HIV positive patients on the importance of antiretroviral therapy (ART) adherence.

Problem statement

Treatment adherence is a problem in chronic diseases and average non-adherence rate of 24, 8% has been reported with the highest rates in patients with HIV. Globally, non-adherence to antiretroviral therapy in adult HIV infected population ranges from 33% to 88%.[8] Most of the reasons cited by the patients for non-adherence are subjective which include distress due to side effects, lack of insight, non-belief in treatment, substance abuse, inability to identify the stressors of life and low self-esteem.

Rao et.al (2007) reported that adherence rates for youths ranges from 27% to 47% which implies that non-adherence ranges from 53% to 73% for youths. As many as 10% of patients miss a dose or more in a day and that about 33% report missing a couple of doses between the past two and four weeks.[9] On average non-adherence to ART is estimated at 50% to 80% in different social and cultural settings.[10]

At Parirenyatwa OI clinic in Harare Zimbabwe, on average five patients report to have missed a dose per day. This means that three in every ten patients i.e. 30% of the patients are non-adherent to the antiretroviral therapy treatment. This was based on experience of those working in the unit.

In a study done aiming at finding patterns of individual and population level of adherence to antiretroviral therapy and risk factors for poor adherence in the first year of the DART trial in Uganda and Zimbabwe, it was found that Zimbabwe has got non-adherence rate of 51%, with good adherence rate 49% at every visit in the first year.[11] Most patients had at least one visit in the year on which they reported not having good adherence, which shows the need for continued adherence interventions in Zimbabwe.Skovdal, Campbell, Nyamukapa and Gregson (2011) showed that adherence was still a problem in Zimbabwe in a qualitative study that they did on adherence to antiretroviral therapy in Zimbabwe. In this study many men undermined their wives' effort to access and adhere to ART.[12] Also many women felt unable to disclose their HIV status to their husbands, forcing them to take their medication in secret, acting without a supportive treatment partner, which is widely accepted to be important for adherence success.

Adherence is a problem in Sub Saharan Africa. Susaki et.al (2012) showed that non-adherence in rural Zambia was 40,1% through their study on adherence to ART during the early months of treatment in rural Zambia.[13] According to their study, they concluded that treatment adherence continues to be a significant challenge in rural Zambia. Similarly Markos, Worku and Davey (2008) showed that non-adherence in Ethiopia was 25,8% and concluded that efforts to improve adherence were supposed to be implemented.[14]

In another study done by Oku, Owoaje, Ige O and Oyo-ita (2013), they showed that non-adherence in south Nigeria was 40, 1% .[15]This rate was too high and needed urgent intervention. One of the pioneer studies conducted by Weiser, Wolfe and Bangsberg (2003) in private clinics in Botswana found self-reported and provider assessment adherence rates of 54% and 56% respectively i.e. non-adherence was 46% and 44% respectively which was high.[16] In another study done in Dakar, Senegal, the authors found out that 22% of the patients were non-adherent. On average the whole of Sub Saharan Africa has a non-adherence of 33%.[8]

Optimal adherence remains a challenge globally and there is a critical need to improve patient - provider communication about the importance of ART adherence and its benefits for patient health.

1.3 Purpose of the study

The study purpose was to determine knowledge levels of HIV positive patients aged between 20 and 50 years on the importance of antiretroviral therapy (ART) adherence at ParirenyatwaOI clinic.

1.4 Objective of the study

To determine the knowledge levels of HIV positive patients aged between 20 and 50 years on the importance of antiretroviral therapy (ART) adherence at Parirenyatwa (I clinic.

1.5 Theoretical framework

The conceptual framework selected for this study was theAdaptation Model by Sister CalistaRoy .

II. Materials and Methods

The research design used in this study was the quantitative descriptive design of non-experimental type.The study was conducted at Parirenyatwa group of hospitals at the O I clinic.Parirenyatwa is a central referral hospital in Harare, the capital city of Zimbabwe. Data was collected using a structured questionnaire. Convenience sampling method was used to recruit the participants and they all gave written and verbal informed consent. Permission to carry out the study was obtained from the Joint Research Ethics Committee (JREC), the ward manage for the OI clinic, consultant of the OI clinic and the Medical Research Council of Zimbabwe (MRCZ).

Basing on Lipsey tables (1990) of estimating sample size, at 95% confidence level and significance level of 0.05, the calculated sample size was 384. However, due to limited time and resources this study used a significance level of 0.175 which gave a calculated sample size of 30 participants. This was justifiable because statistically, as the number of subjects gets to 30 the graphical presentation starts to assume a normal distributive curve hence more representative of the whole population. Included in the study were HIV positive adults, aged between 20 and 50 years, who had been on ART for at least six months, and were Shona (local language) or English speaking. The tool used for this study was the structured questionnaire that consisted of section A that had demographics such as sex, age, religion, and level of education and section B that elicited the participants'knowledge level of ART adherenceand its importance. The section had questions which gave 'yes', 'no' and 'don't know' as choices of their answers and their knowledge to every question was quantified by giving a single mark to every correct answer whilst every incorrect and don't know answer was awarded no mark. The maximum score in section B was 15. A score of 12-15 was high level of knowledge, 8-11 was moderate while 0-7 was low. A pilot study was held at Harare Central Hospital OI clinic which had almost the same set up with Parirenyatwa OI clinic.

III. Results and Findings

3.1 Demographic Characteristics

The study compriseda total of thirty (n=30)attendingParirenyatwa group of hospitals Opportunistic Infections clinic. The ages ranged from 20 to 50 years with a mean of 31 years. Among the participants, 12 (40%) were males and 18 (60%) were females. On marital status, 6 (20%) were single, 12 (40%) were married, 5 (16, 7%) were separated, 4 (13, 3%) were widows and 3 (10%) were divorced. Six (20%) of the participants had gone up to primary level of education whilst 15 (50%) had attained ordinary level of education, 6 (20%) of the participants had gone up to advanced level and 3 (10%) reached tertiary level of education. Concerning the employment status, 11 (36, 7%) of the participants were formally employed, 13 (43, 3%) were unemployed and 6 (20%) were self-employed.

Table 1. Demographic characteristics (N=30)

Variable	Frequency	Percentage (%)
Age		
20- 30 years	18	60
31 – 40 years	6	20
41 – 50 years	6	20
Gender		
Male	12	40
Female	18	60
Marital status		
Single	6	20
Married	12	40
Separated	5	16, 7
Widowed	4	13, 3
Divorced	3	10
Level of education		
Primary	6	20
"O" level	15	50

"A" level	6	20
Tertiary	3	10
Employment status		
Formally employed	11	36, 7
Un employed	13	43, 3
Self employed	6	20

Table 2 is a continued illustration of demographic characteristics of the participants in the study. It includes their monthly income, religion, area of residence, who the participant stays with, other members on ART, period on ART and the drug combination. On monthly income, 9 (30%) of the participants earned USD 300 and below, 16 (53, 3%) of the participants earned between USD 301 and USD 500, 3 (10%) of the participants earned between USD 501 and USD 700 and 2 (6, 7%) of the participants earned above USD 700. Concerning the religion, 15 (50%) were Christians, 9 (30%) belonged to the Apostolic sect and 6 (20%) were Catholic. Pertaining to the areas of residence, 21 (70%) of the participants stayed in the urban areas, 7 (23.3%) of the participants stayed in peri-urban areas and 2 (6, 7%) of the participants stayed in the rural areas. Twelve (40%) of the participants stayed with their spouse, 6 (20%) stayed with their children, 3 (10%) stayed with their siblings, 4 (13, 3%) stayed with their parents and 5 (16, 7%) stayed alone. Twelve (40%) of the participants had a relative or relatives who were on ART whilst 18 (60%) had no relatives who were on ART. Of these 12 (40%) who had relatives who were on ART, the relationship which was between the participants and these relatives was that, 5 (41,7%) were their husbands whilst 7 (58, 3%) were their wives. Concerning to the period on ART, 12 (40%) had been on ART for a periosbetween 6 to 11 months, 7 (23, 7%) 12 to 35 months , 5 (16, 7%) 36-47 months while 6 (20%) of the participants had been on ART for more than 48 months. Among the participants 25 (83, 3%) were on a drug combination of tenofovir, lamuvidine and niverapine (Tenolam + Niv) whilst 5 (16, 7%) were on a drug combination of stavudine, lamuvidine and niverapine (STALANEV). On time taken to reach the health facility, 9 (30%) of the participants took less than 30 minutes to get to the health facility, 16 (53, 3%) took 30 – 60 minutes to reach to the health facility and 5 (16, 7%) took more than 1 hour to get to the health center. Nine (30%) took alcohol while 21 (70%) did not take alcohol. Five (16, 7%) smoked cigarettes and 25 (83, 7%) did not smoke cigarettes.

Table 2: Demographic characteristics (N=30)

Variable	**Frequency**	**Percentage (%)**
Monthly income		
USD 300 and below	9	30
USD 301 – 500	16	53, 3
USD 501 – 700	3	10
Above USD 700	2	6, 7
Religion		
Christian	15	50
Apostolic	9	30
Catholic	6	20
Residential area		
Urban	21	70
Peri urban	7	23, 3
Rural	2	6, 7
Relatives stayed with		
Spouse	12	40
Children	6	20
Sibling	3	10
Parents	4	13, 3
Alone	5	16, 7
Those with relatives on ART		
Yes	12	40
No	18	60
Relationship with the one on ART		
Husband	5	41, 7
Wife	7	58, 3
Period on ART		
6 to 11 months ago	12	40

12 to 35 months ago	7	23, 7
33 to 47 months ago	5	16, 7
More than 48 months ago	6	20
Drug combination		
Tenolam + niv	25	83, 3
Stalanev	5	16, 7

Table 2 continues

Variable	Frequency	Percentage (%)
Time to the health facility		
Less than 30 minutes	9	30
30 to 60 minutes	16	53, 3
More than 1 hour	5	16, 7
Alcohol		
Yes	9	30
No	21	70
Smoking		
Yes	5	16, 7
No	25	83, 3

Knowledge on importance of ART adherence

Table 3 illustrates results for knowledge on importance of ART adherence. Among the participants, 23 (76, 7%) knew that ART should not be stopped once HIV viral load is undetectable in blood while7 (23, 3%) did not know. Twenty-one (70%) of the participants knew the importance of taking the drugs at the right time every daywhile9 (30%) did not know. Twenty-eight (93, 3%) participants knew thatART is taken for the whole lifewhile 2 (6, 7%) did not know. Twenty (66, 7%) participants knew that physical exercise helps to reduce stress levels in HIV positive patientswhile 10 (33, 3%) did not know. Only 4 (13, 3%) participantsknew that over the counter drugs taken without the advice of the doctor can reduce the effectiveness of ART whilst 26 (86, 7%) of the participants did not know. Eleven (36, 7%) of the participants knew that adherence is important because it prevents drug failurewhile 19 (63, 3%) participants did not know. Six (20%) participants knew thatART adherence is important because it prevents second line treatments which are more expensivewhile 24 (80%) did not know. Four (13, 3%) knew that high levels of adherence lead to the correct drug levels in the bloodwhile 26 (86, 7%) did not know. Twenty (66, 7%) knew that adherence is important because it reduces the viral load in the bloodwhile 10 (33, 3%) did not know. Eight (26, 7%) knew that adherence prevents HIV resistance to ARTwhile 22 (73, 3%) did not know. Twelve (40%) of the participants knew that adherence is important because it prevents the transmission of a drug resistant HIVwhile 18 (60%) participants did not know. Eight (26, 7%) participantsknew that high levels of adherence lead to high CD4 count levels while 22 (73, 3%) did not know. Fifteen (50%) participants knew that ART is important in reducing contracting OIs in HIV positive patients while 15 (50%) did not know. With regards to the reduction in mortality rates due to high levels of adherence, Eleven (36, 7%) participants knew that high levels of adherence reduce mortality due to HIV infection while 19 (63, 3%) did not know. Twelve (40%) participants knew that adherence is important in reducing the number of hospitalizations in HIV positive patients while 18 (60%) did not know.

Table 3 :Knowledge on importance of adherence to ART (N=30)

Variable	Frequency	Percentage (%)
Stopping ART once viral load is undetectable.		
Correct	23	76, 7
Wrong	7	23, 3
Taking ART on the right time		
Correct	21	70
Wrong	9	30
Stopping as soon as you feel better		
Correct		
Wrong	28	93, 3
	2	6, 7
Physical exercise reduces stress		

Correct Wrong	20 10	66, 7 33, 3
Over the counter drugs reduces effectiveness of ART Correct Wrong	 4 26	 13, 3 86, 7
Adherence and drug failure Correct Wrong	 11 19	 36, 7 63, 3
Adherence and expensive treatment Correct Wrong	 6 24	 20 80
Adherence and low drug levels in the body Correct Wrong	 4 26	 13, 3 86, 7
Adherence and amount of HIV in the body Correct Wrong	 20 10	 66, 7 33, 3
Adherence and HIV resistance to ART Correct Wrong	 8 22	 26, 7 73, 3

Table 3 continues

Variable	**Frequency**	**Percentage (%)**
Adherence and HIV transmission Correct Wrong	 12 18	 40 60
Adherence and CD4 count Correct Wrong	 8 22	 26, 7 73, 3
Adherence and opportunistic infections Correct Wrong	 15 15	 50 50
Adherence and mortality rates Correct Wrong	 11 19	 36, 7 63, 3
Adherence and number of hospitalizations Correct Wrong	 12 18	 40 60

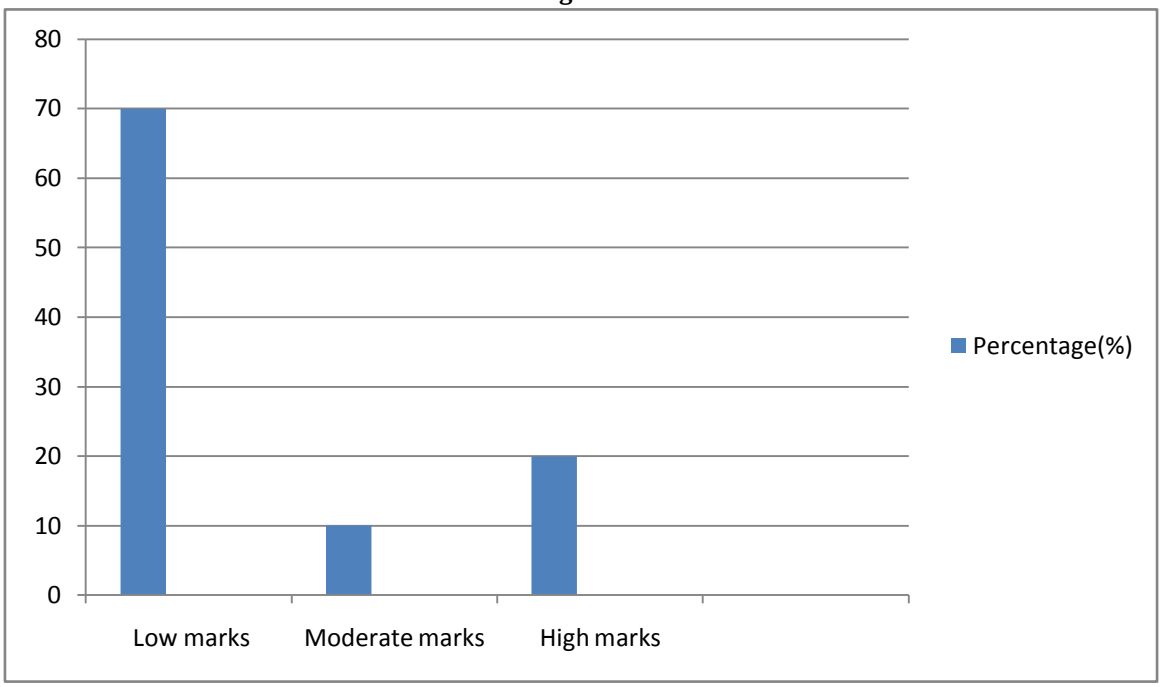
Table 4 illustratessubjects' scores on knowledge. Six (20%) had a high score (12-15 marks), 3 (10%) had a moderate score (8-11 marks) and 21 (70%) scored low marks (0-7 marks).

Table 4 :Scores of importance of adherence to ART (N=30)

Score (marks)	**Frequency**	**Percentage (%)**
Low (0-7)	21	70
Moderate (8-11)	3	10
High (12-15)	6	20

Figure 1 is a graphical presentation of the percentage of the participants who got low marks, moderate marks and high marks.

Figure 1



IV. Discussion

4.1. Sample demographics

The ages for the study sample ranged from 20 to 50 years with the mean age of 31years. According to the global AIDS response progress report of 2012 by the Ministry of Health and Child Welfare in which it was said that the adult (15 years and above) HIV prevalence rate was 13, 1% as compared to that of children (14 years and below) which was 2, 8%. The majority of the participants, 60%, were between 20 and 30 years and 20% of the participants were between 31 and 40 years whilst the other 20% was for those who were between the ages of 41 years and 50 years. According to the Ministry of Health and Child Welfare (2012), around half of the people living with HIV in Zimbabwe are infected during adolescence or young adulthood and this age group will constitute a greater proportion of this population at any given time. This is usually because this is the period when people are more sexually active.

In this study there were more female participants (60%) as compared to 40% of males. According to the National AIDS Council of Zimbabwe (2012) about 60% of Zimbabwean adults living with HIV at the end of 2011 were females and the remaining 40% were for males. Women are more likely to be poorer and less educated than men, predisposing them to HIV infection and making it harder for them to access treatment, care and information. According to WHO/UNAIDS/UNICEF (2011) 64% of eligible females have access to treatment as compared to only 36% of males.[17]Skovdal et.al (2011) found out that men fear the embarrassment associated with being recognized as an AIDS patient (stigma) and this acts as a barrier in accessing services in them there by leading to non-adherence and low knowledge levels on the importance of ART adherence.[12]

In the study it was found out that the majority, 40%, of the participants were married, 20% were single, 16, 7% were separated, 13, 3% were widowed and 10% were divorced. According to the national AIDS council of Zimbabwe (2012), the annual AIDS deaths was 45, 621 with the majority being men. HIV deaths are causing an increase in the number of widows among Zimbabwean women.

Twenty percent of the participants attained primary level of education, 50% of the participants had ordinary level of education, 20% had advanced level of education and 10% had reached tertiary level of education. Zimbabwe has a very high literacy rate (94%) with almost every urbanite being literate.[18]This concurred with the high levels of education which was found in this study.

Most of the participants, 43, 3 %, were unemployed whilst 20% of the participants were self-employed. Only 36, 7% of the participants were formally employed. The majority of the participants, 53, 3%, got an income between USD 301 and USD 500, 30% got USD 300 and below, 10% got between USD 501 and USD 700 with only 6, 7% of the participants getting above USD 700. These results were in concurrence with the publications which were made in the Human Development Report in 2013 which stated that the high unemployment rate among HIV positive patients is the direct result of the HIV epidemic, as workers are either caring for family members or are unwell themselves. According to the Zimbabwe Country Economic Report (2008), Zimbabwe has been on a negative economic growth rate as a result of economic and political crisis since

the new millennium. Low income may have a negative impact on the client's ability to pay for transport costs to hospital for regular clinical review and collection of monthly supply of ART resulting in low adherence. Poverty can also be a source of stress which precipitates low CD4 count in HIV positive patients and negatively affect their knowledge levels.

Half of the participants were Christians (50%), 30% of the participants were from the apostolic sect and 20% of the participants were catholic. To a larger extent, Zimbabwe is a Christian nation and Christians look for medical advice from hospitals more than other religions.[18]

Seventy percent of the subjects were from the urban area, 23, 3% were from the peri urban with only 6, 7% who were from the rural areas. Most of the participants, 53, 3%, took 30 to 60 minutes to reach to the health facility, 30% took less than 30 minutes and only 16, 7% took more than 1 hour to reach to the health facility. According to Duri, Stray-Pedersen and Muller (2013), Zimbabwe has constructed more than 240 new health care settings to date since independence and this has seen about 85% of the Zimbabwean population living within 10km of a health care facility.[18] Distance to a health care facility may have a negative impact on adherence and knowledge on importance of ART adherence as patients who cannot afford transport cost to the health care facility will miss health teachings on adherence when they choose not to go to the health facility.[12]

Forty percent of the participants stayed with their spouses, 20% with their children, 10% with their siblings, 13, 3% with their parents and 16, 7% stayed alone. Sixty percent had no relatives who were on ART and 40% of the participants had a relative who was on ART and of these 58, 3% had their wives on ART and 41, 7% had their husbands on ART. The relatives who the patient stays with and the relatives who are on ART together with the patient form the social support network for the patient. According to Skovdal et.al (2011), family support plays an important role in patient's adherence and knowledge on the importance of adherence. It is important that the family members are aware and have an understanding of their relative's treatment regimen so that they can help remind the patient about when to take drugs and when to attend consultations.[12] This will in turn have a positive impact on the knowledge levels on the importance of ART adherence as the family members swqsxwqsxwxdwill discuss with the patient on issues pertaining to adherence. The relationship is important as it determines the interaction between the patient and the relatives. Those who are more close to each other like the wife and husband will benefit more as the patient will be free to express his/her concerns without fear of stigmatization..

Most the participants, 40%, were on ART for a period between 6 and 11 months. The time on treatment correlates with better or even higher knowledge levels because of exposure to symptoms, health and treatment (diet wise and pharmacologically). Most of the participants, 83, 3%, were on Tenolam and niverapine whilst 16, 7% were on stalanev. Studies have shown that when patients experience serious side effects from the drugs they tend to stop treatment or take it irregularly. This will in turn have a negative impact on their level of knowledge on the importance of adherence. Tenolam and niverapine have fewer side effects as compared to stalanev and this has seen many patients being initiated on tenolam and niverapine and others who have experienced side effects from stalanev being switched on to tenolam and niverapine.

4.2 Sample knowledge on importance of ART adherence

ART should not be stopped once HIV viral load is undetectable in blood. Among the participants, 23 (76, 7%) responded correctly to this question and 7 (23, 3%) gave a wrong response to this question. The majority of the participants knew this question and only a few got it wrong. The majority of those who got it wrong were likely to be females who were either divorced, single, separated and widowed. The majority of them stayed alone and they had no other relative who was on ART. They might have had a poor support network. Skovdal et.al (2011) suggested that family support is important in adherence and knowledge on adherence. The majority of those who got the question wrong had a period of 6 to 11 months on ART. The time on treatment correlates with better or even higher knowledge levels because of exposure to symptoms and treatment. The more the time on treatment an individual is, the higher the knowledge and vice versa. The level of education did not influence much the knowledge levels on this question.

On the importance of taking the drugs on the right time every day, 21 (70%) of the participants knew about it and 9 (30%) of the participants did not know about it. On this question the level of knowledge was generally high. Of the 9 participants who got it wrong 8 were women. This was in line with what was published by the national AIDS council of Zimbabwe (2011) in which they said that women are more likely to be poorer and less educated than men which makes it harder for them to access treatment and information there by resulting in low levels of knowledge among them. The 30% which got the question wrong also had a poor social support network as none of them had a relative who was on ART and they stayed alone. Those who got the

question correct were likely to have had attained ordinary level and could have been capable of using literature, printed media and electronic media to learn about HIV adherence and its importance.

Concerning the fact that ART is taken for the whole life, 28 (93, 3%) of the participants responded correctly to this question whilst only 2 (6, 7%) of the participants did not know about this. Generally the level of knowledge on this question was high. The high level of knowledge on this question was attributed to the fact that 60% of the participants had been on ART for more than a year and had attained at least ordinary level of education. Nine (30%) participants drank alcohol and 5 (16.7%) smoked cigarettes. Alcohol and drugs have a negative effect on cognition and might interfere with knowledge levels and adherence rates.

On the aspect that physical exercise helping to reduce stress levels in HIV positive patients, 20 (66, 7%) of the participants gave a correct response and only 10 (33, 3%) did not. Again there was high knowledge on this question. This was again due to the high percentage (60%) of participants who attained at least ordinary level and they had at least 3 years on ART. Those who gave wrong answers were alcohol takers and smokers.

Over the counter drugs taken without the advice of the doctor can reduce the effectiveness of ART. Only 4 (13, 3%) of the participants gave a correct response to this question whilst 26 (86, 7%) of the participants did not know this question. The level of knowledge on this question was low. Over the counter drugs do indeed interfere with ART and this also constitutes non adherence. Use of over the counter drugs without notifying the doctor should be discouraged.

Pertaining to the fact that adherence is important because it prevent drug failure, only 11 (36, 7%) of the participants knew about this and 19 (63, 3%) of the participants did not know about this. These were the similar findings to those of Potchio et.al (2010) in Togo in which the patients did not know that poor adherence causes drug failure.[19]The participants who got this question wrong were unemployed and the majority of them had an income of less than USD300 per month. Low income can act as a source of stress in patients with chronic illnesses and affect attention span during teaching sessions which results in patient missing some important information there by resulting in low knowledge. In addition to this, they took 30 to 60 minutes with some of them taking more than 1 hour to reach to the health care facility. Taking more time to get to the health facility will result in patients being late to health teachings and at times they do not attend these teachings leading them into missing crucial information on ART adherence and its importance resulting in low levels of knowledge.[12] Those who got the question correct were formally employed and the majority of them got an income between USD 301 and USD500.

Concerning the fact that ART adherence is important because it prevents second line treatments which are more expensive, only 6 (20%) got this question correct whilst 24 (80%) got it wrong. The level of knowledge on this question was low meaning that low knowledge and emphasis is given by the health workers. Some of the participants, who got this question wrong attained primary level of education, had poor support network and the majority of them stayed alone. Those who got the question correct had reached advanced and tertiary level of education.

On the fact that high levels of adherence leads to the correct drug level in the blood, only 4 (13, 3%) of the participants got the question correct and 26 (86, 7%) got the same question wrong. There was generally low knowledge on this question contrary to what was found by Nachega et.al (2005) in their study in Soweto South Africa in which 80% knew that high levels of adherence are directly proportional to correct drug levels in the body.[20]Low levels of knowledge among participants at Parirenyatwa O.I clinic was due to poor support network.

On the fact that adherence is important because it reduces the viral load in the body, 20 (66, 7%) knew about it and only 10 (33, 3%) did not know about this. There was high knowledge on this question and it was in line with what was found by Aguarson et.al (2013) in their study in Tanzania in which 75% of their participants knew that ART adherence reduce the body viral load.[21]HIV positive patients are likely to be aware of the fact that ART reduces viral load as this appears to be the chief concern to most HIV positive individuals who are initiated on ART.

Pertaining to the fact that adherence prevents HIV resistance to ART, only 8 (26, 7%) got this question correct and 22 (73, 3%) got this question wrong. There was low level of knowledge at Parirenyatwa to this question and this was contrary to the by Susaki et.at (2012) in Zambian which knowledge was found to be high on this question.[13]there is need therefore to educate patients about the danger of developing drug resistance as this leaves one with fewer treatment options which are in most cases more expensive.

On the fact that high levels of adherence leads to high CD4 count levels, 8 (26, 7%) of the participants responded correctly and 22 (73, 3%) did not. This reflected low knowledge on this question. This is contrary to the results of the study done by Mills et.al (2006) in Tanzania which showed 70% knowledge level on this.[8]this is an anomaly because $CD4^+$count is one of the diagnostic tests done when one is initiated on ART and extensive health education is given on it. Majority of the participants were expected, therefore, to have knowledge on this.

Like what was found in other researches on knowledge among HIV patients, the overall level of knowledge in this study was found to be low among the HIV positive patients at Parirenyatwa OI clinic. This was according to the scores acquired by the participants. Six (20%) had a high score (12-15 marks), 3 (10%) had a moderate score (8-11 marks) and 21 (70%) scored low marks (0-7 marks). Aguarson et.al (2013) did a study on the knowledge of HIV therapy and implications of stigma on programs in Tanzania and they found a broad lack of antiretroviral therapy knowledge.[21]Saumya, Bimal and Asirvathan (2012) also demonstrated the low levels of knowledge among HIV positive patients when they did a study on knowledge of antiretroviral therapy in preventing parent to child transmission of HIV in India.[22] The overall low level in knowledge in this study could be due to the fact that the majority of the participants (60%) had no relatives who were on ART and the majority of the participants (80%) were not married which reflected poor social support network and the majority of the participants (40%) had a shorter period on ART (6 to 11 months).

Health care professionals should emphasize on health education and should device a way of evaluating whether the HIV positive have understood the health education they are given

V. Nursing Implications

5.1 Nursing Practice

The results reviewed that the clients lacked knowledge on the fact that over the counter drugs reduces the effectiveness of ART and that ART adherence is important because it prevents high costs through the use of second line treatment after the failure of the first line. They also lacked knowledge on the importance of ART adherence to maintain optimal drug levels in the body, to prevent viral drug resistance, to maintain high CD4 counts in the body, in preventing contraction of opportunistic infections and in decreasing morbidity and mortality rates. Nurses need to give more emphasis during contact with HIV positive patients on ART during teaching and counseling sessions.

The results also showed that some of the participants had a lifestyle of drinking alcohol and smoking. It should therefore be stressed out how lifestyle change and adaptation effectively improve ART adherence and prevent high morbidity and mortality rates due to HIV and how it improves the quality of life of these patients.

5.2 Nursing research

The study need to be replicated with a larger sample that is more representative of the general population.

Recommendations

Nursing professionals and other health providers should educate more on the importance of ART adherence to improve adherence levels among HIV positive patients on ART. They should reinforce on the importance of status disclosure to relatives, high interaction with relatives on ART and health care providers to improve social support networks and lifestyle changes and adaptation such as physical exercises to control stress and stop smoking tobacco and drinking alcohol so as to avoid non adherence to ART.

Encouraging utilization of HIV positive patient support groups to try and improve adherence through social support. The goal of nursing is to promote adaptive responses in situations of health and illness. In order to improve how nurses practice; the researcher recommends the strong use of Adaptation Model by Roy to guide them in delivering care to clients.

VI. Conclusion

The level of knowledge of the importance of adherence observed in this study was generally low. Improving patient's knowledge and understanding of their disease and treatment by nursing staff has a positive

impact on adherence level.AtParirenyatwa OI clinic in Harare, Zimbabwe, on average 30% of the patients are non-adherent to the antiretroviral therapy treatment (National AIDS Council of Zimbabwe, 2012).

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