

Alcohol use among People Living with HIV/AIDS (PLWHA) on Highly Active Antiretroviral Therapy (HAART) at Otjiwarongo ART Clinic and its' effects on their adherence to HAART.

By

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DECLARATION

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Abbreviations

PLWHA	Person Living with HIV and AIDS
ART	Antiretroviral Therapy
WHO	World Health Organisation
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNICEF	United Nations Children's Fund
SIAPAC	Social Impact Assessment and Policy Analysis Corporation
HCW	Health Care Worker
HAART	Highly Active Antiretroviral Therapy
USA	United States of America
CD4 Cell Count	Number of T-Helper cells
FAO	Food and Agriculture Organisation
CSW	commercial sex workers
IDU	intravenous drug users
STI	sexually transmitted infections
ACTG	AIDS Clinical Trials Group
AUDIT	Alcohol Use disorders Identification Test

Abstract

Alcohol use among PLWHA has long been recognized as a challenge in terms of HIV disease progression. However no local (Namibian) study has been done to look at prevalence of alcohol use among PLWHA on HAART and its effect on the patients' adherence to HAART. A cross sectional survey was conducted at Otjiwarongo ART clinic to look at the proportion of PLWHA who use alcohol and the association between alcohol use and adherence to HAART.

The target population was PLWHA on HAART at Otjiwarongo ART Clinic who; are 18 years and older and have been on HAART for a minimum of three months. Systematic sampling was used to select participants. A total sample size of 102 participants was obtained. Of those participants, 61(59.8%) were females and 41(40.2%) were males.

Of the 102 participants, 14(13.73%) were in the age range of 18-28, 36(35.3%) in the age range of 30-39, 32(31.4%) in the age range of 40-49 and 20(19.6%) were in the age range of above or equal to 50 years.

Of the total participants, 54(52.9%) used alcohol and 48(47%) were non-alcohol users. Of those who used alcohol 33(32.4%) were hazardous alcohol users (**Abuse**) while 21(20.6%) were non-hazardous alcohol users (**Alcohol use**).

Of the 102 participants, 90(88.2%) were adherent to HAART in the four days prior to contact of the survey. These participants managed to take 95% or more of the total doses of their antiretroviral medicines. A total of 12(11.8%) of the participants were non adherent to HAART in the four days preceding the survey.

Of the 33 participants who are hazardous alcohol users, 26(78.8%) were adherent to HAART compared to 7(21.2%) who were non adherent to HAART. The picture changes among those who did not use alcohol. Of the 48 participants who did not use alcohol, 44(91.7%) were adherent to HAART and 4(8.3%) were not adherent. What is interesting to note is the fact that of those who were non-hazardous alcohol users, adherence to HAART remained high. Adherence for this group was 95.2 % (20 out of 21 participants).

This study found that PLWHA on HAART Otjiwarongo hospital use alcohol more than the general population. This goes to show that alcohol abuse among PLWHA is indeed a problem which needs urgent attention

Though the adherence is good among all the other PLWHA on HAART, adherence was particularly low in those PLWHA who were hazardous alcohol users (Alcohol Abusers). Adherence in this group was significantly low. This goes to show that hazardous alcohol use is associated with poor adherence to HAART. This re-emphasizes the need to screen all PLWHA for alcohol abuse before HAART is started so that appropriate support and advice can be provided.

OPSOMMING

Alkoholgebruik onder mense wat met MIV/Vigs leef (PLWHA) word lank reeds erken as 'n uitdaging ten opsigte van MIV-siekteprogressie. Geen plaaslike (Namibiese) studie is egter nog onderneem om te kyk na die voorkomssyfer van alkoholgebruik onder PLWHA op hoogs aktiewe antiretrovirale terapie (HAART) en die effek daarvan op die pasiënte se navolging van HAART nie. 'n Deursnee-opname is by die Otjiwarongo ART-kliniek onderneem om te bepaal watter deel van PLWHA alkoholgebruik en wat die verband tussen alkoholgebruik en die navolging van HAART is.

Die teikenbevolking was PLWHA op HAART by Otjiwarongo ART-kliniek wat 18 jaar of ouer is en reeds minstens drie maande lank HAART gebruik. Sistematiese toetsing is gebruik om deelnemers te kies. 'n Totale steekproef van 102 deelnemers is verkry. Van hierdie deelnemers was 61 (59.8%) vroue en 41 (40.2%) mans.

14 (13.73%) van die 102 deelnemers was in die ouderdomsgroep 18-28, 36 (35.3%) in die ouderdomsgroep 30-39, 32 (31.4%) in die ouderdomsgroep 40-49 en 20 (19.6%) was in die ouderdomsgroep 50 jaar of ouer.

Van die totale groep het 54 (52.9%) alkoholgebruik en 48 (47%) was nie-gebruikers van alkohol. Van diegene wat alkohol gebruik het, was 33 (32.4%) oormatige alkoholgebruikers (misbruikers) terwyl 21 (20.6%) matige alkoholgebruikers was.

90 (88.2%) van die 102 deelnemers het in die vierdae voor kontak met die opname die HAART gevolg. Hierdie deelnemers het 95% of meer van die totale dosisse van hul antiretrovirale medisyne ingeneem. Altesaam 12 (11.8%) van die deelnemers het nie in die vier dae voor kontak met die opname die HAART gevolg nie.

Van die 33 deelnemers wat oormatige alkoholgebruikers was, het 26 (78.8%) die HAART gevolg in vergelyking met 7 (21.1%) wat nie die HAART gevolg het nie. Die prentjie verander onder diegene wat nie alkohol gebruik het nie. Van die 48 deelnemers wat nie alkohol gebruik het nie, het 44 (91.7%) die HAART gevolg en 4 (8.3%) het dit nie gevolg nie. Dit is interessant

om daarop te let dat van diegene wat matige alkoholgebruikers was die navolging van HAART hoog gebly het. Navolging vir hierdie groep was 95.2% (20 uit die 21 deelnemers).

Hierdie studie het bevind dat PLWHA op HAART in die Otjiwarongo-hospitaal meer alcohol gebruik as die algemene bevolking. Dit dui daarop dat alcoholmisbruik onder PLWHA inderdaad 'n problem is wat dringende aandag vereis.

Hoewel die navolging onder al die ander PLWHA op HAART goed was, was die navolging besonder laag by dié PLWHA wat oormatige alkoholgebruikers (alkoholmisbruikers) was. Navolging in hierdie groep was aansienlik laag. Dit dui daarop dat oormatige alkoholgebruik met swak navolging van HAART geassosieer word. Dit herbeklemtoon die behoefte aan sifting van alle PLWHA vir alkoholgebruik voordat met HAART begin word sodat behoorlike steun en advise voorsien kan word.

CHAPTER 1: BACKGROUND

1.1 Introduction:

Great strides have been made in an effort to combat the scourge of HIV in Sub-Saharan Africa. In 2008, Sub-Saharan Africa had about 7 million PLWHA who needed HAART of which 3 million had access to HAART (WHO; UNAIDS; UNICEF. 2009). In Namibia the situation is even better with more than 70% of PLWHA having access to HAART (MOHSS. 2012). However all the gains realised so far can easily be eroded if PLWHA are not adhering to treatment. If patients are not adhering to treatment then there will be a threat of drug resistant HIV strain spreading. In order to achieve adequate viral suppression, which reduces risk of resistance, a 95% adherence to HAART should be maintained (Kresina, Flexner and Sinclair.2002). A number of factors have been shown to be associated with poor adherence to HAART. These include psychosocial, demographic and medicine related factors (Bhat, Ramburith, Singh, Titi, Antony et al. 2005). Alcohol consumption has been shown to decrease adherence to HAART (Pandrea, Happel, Amedee, Bagby and Nelson. 2010). Alcohol consumption has also been shown to increase rate of HIV transmission and increase disease progression (Pandrea et al 2010). Alcohol causes dis-inhibition which increases risk of HIV transmission. Alcohol has also been shown to affect disease progression by its effect of increasing viral replication and reducing CD4 count (Samet, Horton and Meli.2004).

Namibia is a country with high alcohol consumption rate. A survey undertaken by SIAPAC (Social Impact Assessment and Policy Analysis Corporation- Namibia) in 2002 showed that 56% of adults use alcohol with a mean consumption of 30 beers per week. 26% of adults reported binge drinking with an average consumption of 78 beers per week (SIAPAC. 2002). Studies done in the USA showed that PLWHA are more likely to abuse alcohol as compared to the general population (Pandrea et al 2010). In industrialised countries poor adherence has been shown to be linked to alcohol use even among those who do not meet the criteria for hazardous drinking (Jaquet, Ekouevi, Bashi, Aboubakrine et al. 2010). It is therefore important to know what proportion of PLWHA on HAART use alcohol and what is the link between alcohol use and adherence to HAART. This will assist in planning for interventions aimed at reducing the use of alcohol among PLWHA.

1.2 Research Problem:

Currently we do not know what proportion on PLWHA on HAART at Otjiwarongo ART Clinic use alcohol. We also do not know the influence of use of alcohol on adherence to HAART. There is a serious threat posed by poor adherence to HAART among PLWHA at Otjiwarongo ART (Antiretroviral Therapy) Clinic. Health Care Workers have associated poor adherence to alcohol use though no local study has been done to ascertain what proportion of PLWHA actually use alcohol and what the association between alcohol use and poor adherence is.

1.3 Research Question:

What is the influence of alcohol use on adherence to HAART by PLWHA at Otjiwarongo ART Clinic?

1.4 Aim of Study:

To establish the influence of alcohol use on adherence to HAART by PLWHA at Otjiwarongo ART Clinic.

1.5 Objectives:

1. To investigate the proportion of PLWHA on HAART who use alcohol
2. To assess the levels of adherence to HAART by PLWHA at Otjiwarongo ART Clinic
3. To explore the link between alcohol use and poor adherence to HAART by PLWHA at Otjiwarongo ART Clinic.

CHAPTER 2: LITERATURE REVIEW

2.1 Trends of Alcohol use in Namibia

According to the WHO report on alcohol consumption, Namibia is ranked 52 in the world in alcohol consumption (WHO 2011). Moldova is the highest consumer of alcohol with an estimated consumption of 18.22 litres per capita per year. This is followed closely by some other European countries namely Czech Republic, Hungary, Russia etc. Though Namibia is ranked 52, it still has a high alcohol consumption of 9.62 litres per capita. What is disturbing about the 2011 figures is that the alcohol consumption has more than tripled in the last 10 years. According to the Food and Agriculture Organisation (FAO) report on world drinking trends in 2003, Namibia had an estimated alcohol consumption of 2.5 litres per capita (FAO 2003). According to the World health survey report of 2003, 4.9% females were heavy and hazardous drinkers as compared to 3.1% in males in Namibia. This trend is very worrisome in the context of HIV transmission. According to the WHO 2004, traditional beverages are the predominant source of alcohol for both urban and rural dwellers. Examples of these beverages include “*matuke*” which is a watermelon wine and “*walende*” which is made from distilled palms pine (WHO 2004). In rural areas, traditional beverages account for 67% of alcohol consumed (LeBeau. 2009).

One of the contributing factors to high alcohol usage is the easy availability of cheap alcohol. An estimated 265 bars were found in a 2.5 mile area in Katutura (Windhoek) and most of these operate from home (Gaynair. 2012). This makes it easy for any person to access alcohol source including children. According to UNICEF, 32% of children aged between 10 and 15 years had been given alcohol by their parents or guardians (LeBeau.2009). This trend is disturbing if those who are supposed to dissuade children from alcohol are actually the ones giving them alcohol. This essentially means that those children “initiated” into drinking at an early stage will most likely grow to become heavy and hazardous drinkers.

2.2 Alcohol use among PLHWA

Alcohol use among PLWHA has been found to be higher than in the general population in some studies. Studies done in the USA showed that PLWHA are more likely to use alcohol than the general population (Pandrea et al. 2010). Other studies showed that up to 50% of PLWHA abuse

alcohol (Mariana, Carlin, Shenghan and Sabrina et al. 2009). In Namibia no local study has been done to look at the prevalence of alcohol use among PLWHA.

2.3 Alcohol use and high risk sexual behaviour

Alcohol has been shown to cause dis-inhibition in people. This results in people engaging in unsafe sex such as multiple concurrent sexual partnership, unprotected sex and sex with high risk partners like commercial sex workers (CSW) or intravenous drug users (IDU) (Pandrea et al. 2010). This high risk sexual behaviour might result in a person acquiring other sexually transmitted infections (STI) which further increases the risk of HIV transmission. These STIs can be either ulcerative like herpes and syphilis or inflammatory like gonorrhoea and Chlamydia. In Namibia it is a well known fact that some people exchange sex for alcohol (LeBeau. 2009). This is especially so for teenage girls who go to bars and depend on older men to buy them alcohol. This put these girls at risk of HIV infection because they are less empowered to negotiate for use of a condom. In a study done by LeBeau in the Northern parts of Namibia, some male participants said they found it difficult to control their sexual desire when they are under the influence of alcohol (Le Beau, Fox, Becker and Mafune. 1999). This results in those men having sex with anyone available. Some informants mentioned that people “*sleep around when they are drunk and forget to use a condom*”. Study done by LeBeau in 2005 indicated that alcohol use increases the vulnerability of migrant population to HIV (Le Beau. 2008). These include the truck drivers, fishermen, military men and mobile businessmen.

2.4 Alcohol use increases HIV/AIDS disease progression

Alcohol directly suppresses the immune system (Mariana et al. 2009). This is due to its effect on immune cells like t-cells, natural killer cells and macrophages. It causes a decline in the CD4 count even in the absence of HIV. This therefore means alcohol and HIV will compound each other to reduce the CD4 count and hence the immunity of an individual who is HIV infected. Alcohol also indirectly causes immunosuppression by its effect of causing malnutrition and liver disease (Molina, McNurlan, Tathmacher et al. 2006).

Alcohol has also been shown to increase viral replication in HIV infected individuals (Pandrea et al. 2010). Other studies have shown an increase in replication of HIV1 in peripheral blood

mononuclear cells (Bagasra, Kajdacy-Balla, Lischner and Pomerantz. 1989). Chronic alcohol intake prior to HIV infection has also been shown to result in high viral set points (Molina, Lang, McNurian, Bagby and Nelson. 2008). This high viral set point results in rapid progression of the disease. For a patient who is on HAART, alcohol causes reduced viral load suppression, poor CD4 count response and poor adherence to HAART (Mariana et al. 2009). All these factors will result in rapid progression of the disease to end point and subsequently death.

2.5 Alcohol effects on ARV Treatment

Alcohol affects the effectiveness of HAART on PLWHA by its effects on adherence to HAART, its effects on the liver which affects drug metabolism and also its effect of increasing the viral load (Pandrea et al 2010). All this has an effect of poor outcome to HAART. In order for a patient to get an adequate viral suppression, their adherence to HAART should be at least 95% (Kresina et al 2002). Inadequate viral suppression can result in development of a drug resistant viral strain. Several studies have shown a direct link between alcohol consumption and adherence to HAART (Pandrea et al 2010). Some studies have shown that patients who use alcohol have a nine fold increase in non adherence as compared to those who do not use alcohol (Parsons, Rosoe, and Mustanski. 2008). Of importance to note is that these studies talk of alcohol users, not necessarily alcohol abusers. This is important because some people have an opinion that alcohol use is okay as long as there is no abuse. A lot of research has been done to try to link alcohol abuse and non adherence to HAART. What is important is to try and link alcohol use and non adherence to medication. A study done by Samet and colleagues showed that alcohol use was a predictor of adherence (Samet, Horton, Meli, Freedberg and Palepu. 2004). The same study showed that the magnitude of non adherence to HAART was directly linked to the magnitude of alcohol use, in other words the higher the level of alcohol abuse the higher the level of non adherence.

Alcohol use also has an effect on the metabolism of ARVs by the liver. Alcohol is metabolised by the liver which is the same organ responsible for metabolism of most of the ARV drugs (Pandrea et al 2010). This can result in some drug to drug interactions which might result in toxic effects of some of the medications. These drug to drug interactions might worsen the usual side

effects of some ARV Drugs which might result in some patients stopping taking their medication. Some drug to drug interactions might also result in poor outcomes and even death.

2.6 Factors Affecting Adherence to HAART

In order to achieve optimal clinical outcome, PLWHA who are on HAART need to take 95% or more of their prescribed ARV medications (Magutu, Zewotir, North et al 2010). Adherence to HAART is influenced by a host of factors which can be grouped into social, behavioral, demographic and economic (Magutu et al 2010). Studies have however failed to concur on the link between demographic factors and adherence to HAART. Age for example has not been consistently shown to affect adherence to HAART (Murphy, Marelich, Hoffman and Steers. 2004). Social factors however have consistently been linked to adherence to HAART. Social support for example was shown to be a very important determinant to HAART adherence, with patients with better social support tending to be adherent to HAART. Patients who live with a partner for example have been shown to adhere more to HAART as compared to those patients with no partner (Williams, Friedland. 1997). Owning a cellular phone for example has been found to be associated with good adherence to HAART (Magutu et al 2010). This could be because patients who own cellular phones can use them to set reminders on times to take HAART medication. What is also interesting is the finding that adherence to HAART tends to improve the longer the patient stays on HAART (Magutu et al 2010). This has been associated with support the patient might get from other patients as they meet at the ART clinics. Also this could be because of continued counseling by health care workers.

2.7 Methods of measuring adherence to HAART

The most commonly used methods of measuring adherence are Self Reported and electronic monitoring devices (Levine, Hinkin, and Keuning et al. 2006). However in Namibia the most commonly used method is physical pill count which is not electronically done. Self reported adherence is done using either self administered questionnaire or interviewer administered questionnaire. This method has its limit of lack of objectivity (Chesney, Morin and Sherr 2000). The patient might tend to respond in a desirable way but which might not be actual reality. The patients also might not recall some missed doses. In order to help this bit of not remembering, most Self Reported adherence testing methods have been confined to the past 3 to 4 days before

the interview (Levine et al 2000). According to Levine and associates, Electronic monitoring gives a more objective way of measuring adherence. It can also measure the exact time when the patient took their medication and the number of doses taken. However this is not readily available in Namibia.

CHAPTER 3: Research Design and Methods:

3.1 Design and setting

This was a quantitative research study. A cross sectional survey of PLWHA on HAART at Otjiwarongo ART Clinic was done. The target population was PLWHA on HAART at Otjiwarongo ART Clinic who; are 18 years and older and have been on HAART for a minimum of three months. Systematic sampling was used to select participants. The sampling was done during the patient's routine Tuesday visit to the clinic. All the patients visiting the clinic on Tuesdays were assessed whether they qualify to be included in the study. The qualification criteria was any patient living with HIV/AIDS who is 18 years and older, has been on highly active antiretroviral therapy for a minimum of three months. . Every second patient of those who qualify was invited to take part in the study. The community counselors were responsible for inviting patients who qualify. The researcher did not take part in the invitation of patients in order to avoid creating power distance. This process continued until a sample size of a minimum of 90 participants was reached.

3.2 Procedure

Three community counselors who are normally involved in counseling of patient were enlisted to the study. They were trained on the study protocol and were responsible for administering the questionnaire to the participants face to face. The questionnaire was in three sections namely socio-demographic section, alcohol use and adherence to HAART. A written informed consent was obtained from all participants. The first section was used to collect data on gender, age, education, employment, average monthly income and duration on HAART.

3.3 Measures

Adherence to HAART in the last four days was tested using AIDS Clinical Trials Group (ACTG) questionnaire (Chesney, Ickovics and Chambers et al 2000). This formed the second part of the questionnaire. If a patient was adherent to HAART for more than 95% in the past 4 days, he/she was classified as being adherent. If a participant was adherent to HAART for less

than 95% in the past four days, he/she was classified as being non-adherent. This therefore divided the participants into two groups i.e. adherent and non-adherent.

Use of alcohol among the participants was measured by the Alcohol Use disorders Identification Test (AUDIT) (Saunders, Higgin-Biddle, Babor and Montero. WHO 2001). When this tool was used to score the responses from participants, they were then classified into three classes: non alcohol users, non hazardous alcohol users and hazardous alcohol users. A score of zero meant that the participant was a non alcohol user, a score between 1 and 7 was classified as non hazardous alcohol user and a score of 8 or more was classified as hazardous alcohol user.

3.4 Analysis

The collected data was analysed using software Epi-Info. This software was used to calculate the frequency of alcohol use among the participants, their adherence to HAART and to investigate the association between alcohol use and adherence to HAART. In this case the alcohol use was the independent variable and adherence to HAART was the dependent variable.

3.5 Ethical Considerations

Before the study was carried out a written approval was sought from the Ministry of Health Ministry of Health and Social Services. Copies of this written approval were given to the Regional Director and the Principal Medical Officer of Otjiwarongo. Before data was collected from research participants, they were informed about the study. In other words the research participants were told about the study, its purpose and the anonymity of the collected data. They were given an opportunity to either accept or decline to participate in the study. Those who accepted to participate were given a written consent form and the contents of the consent form were explained to them. If they were satisfied, they then signed the informed consent. The study was restricted to participants aged 18 years and above, therefore there was no need to get an informed consent from the guardians. All possible mechanisms were put in place to ensure the anonymity of data collected and to maintain confidentiality. No names were collected during the survey or any data that could link the participant to the data collected. Numerical codes were used for the research participants. Care was made to ensure that there is no link between the participants' real identity and the numerical codes. All collected data was stored in a lockable

cabinet in the researcher's office. Access to that office was limited to ensure strict confidentiality of the collected data.

CHAPTER 4: RESULTS AND DISCUSSION

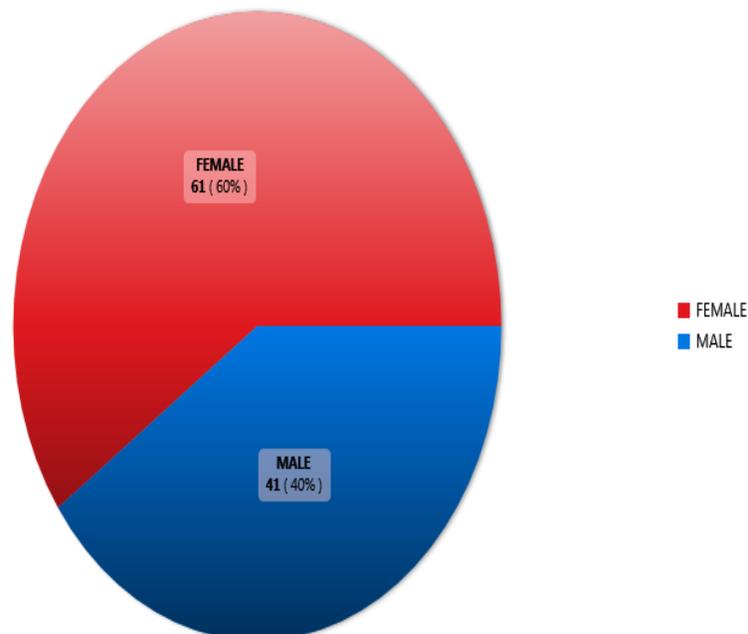
4.1 Socio-demographic characteristics of research participants

A total sample size of 120 participants was obtained. There was a response rate of 85%. In other words 102(85%) participants accepted to take part in the research and 18(15%) declined to take part. Of those participants who accepted to take part, 61(59.8%) were females and 41(40.2%) were males.

Table 1: Gender distribution of research participants

Gender	Frequency	Percent	Cum. Percent
FEMALE	61	59.80%	59.80%
MALE	41	40.20%	100.00%
TOTAL	102	100.00%	100.00%

Figure 1: Pie chart on Gender distribution of research participants

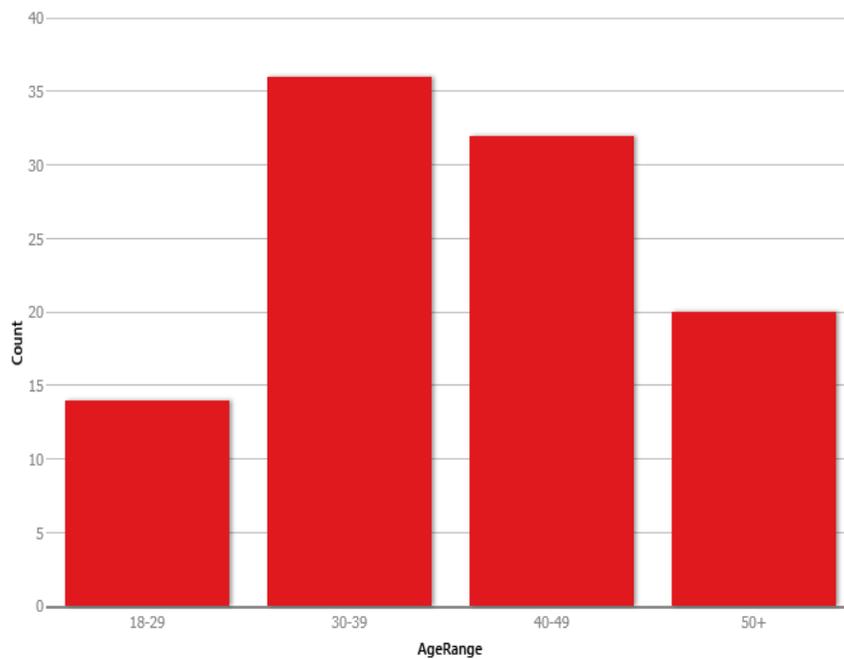


Of the 102 participants, 14(13.73%) were on the age range of 18-28, 36(35.3%) in the age range of 30-39, 32(31.4%) in the age range of 40-49 and 20(19.6%) were in the age range of above or equal to 50 years.

Table 2: Age distribution of participants

Age Range	Frequency	Percent	Cum. Percent
18-29	14	13.73%	13.73%
30-39	36	35.29%	49.02%
40-49	32	31.37%	80.39%
50+	20	19.61%	100.00%
TOTAL	102	100.00%	100.00%

Figure 2: Column chart on age range of participants



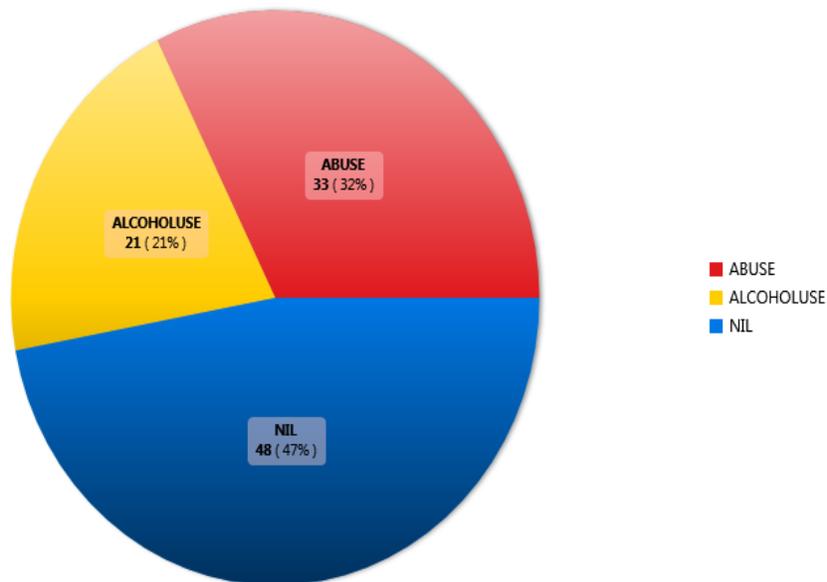
4.2 Alcohol use

Of the total participants, 54(52.9%) used alcohol and 48(47%) were non alcohol users (Nil). Of those who used alcohol 33(32.4%) were hazardous alcohol users (Abuse) while 21(20.6%) were non hazardous alcohol users (Alcohol use).

Table 3: Alcohol use among the research participants

ALCOHOL USE	Frequency	Percent	Cum. Percent	95% CI Lower	95% CI Upper
ABUSE	33	32.35%	32.35%	23.42%	42.34%
ALCOHOLUSE	21	20.59%	52.94%	13.22%	29.73%
NIL	48	47.06%	100.00%	37.10%	57.20%
TOTAL	102	100.00%	100.00%		

Figure 3: Pie chart showing the use of alcohol among the participants



Hazardous alcohol use is more common in the age range of 30-39 years with 14(38.9%) of participants in this age range being hazardous alcohol users. This is closely followed by participants in the age range of 40-49 years with 11(35.5%) of participants being hazardous alcohol users.

Table 4: Relationship between Alcohol use and the age range

ALCOHOLUSE	18-29	30-39	40-49	50+	TOTAL
ABUSE	2	14	11	6	33
ALCOHOLUSE	3	6	7	5	21
NIL	9	16	14	9	48
TOTAL	14	36	32	20	102

Hazardous alcohol use is not much different between the males and females. 19(31.5%) of the female participants were found to be hazardous alcohol users and compared to 14(34.2%) of the male participants who found to be hazardous alcohol users.

Table 5: Relationship between Gender and alcohol use

Gender	ABUSE	ALCOHOLUSE	NIL	TOTAL
FEMALE	19	11	31	61
MALE	14	10	17	41
TOTAL	33	21	48	102

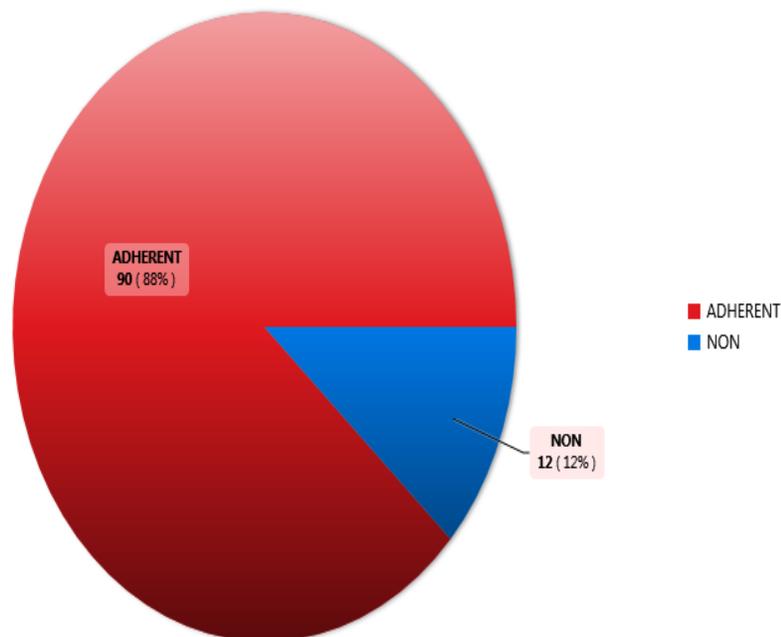
4.3 Adherence to HAART

Of the 102 participants, 90(88.2%) were adherent to HAART in the four days prior to contact of the survey. These participants managed to take 95% of more of the total doses of their antiretroviral medicines. 12(11.8%) of the participants were non adherent to HAART in the four days preceding the survey.

Table 6: Adherence to HAART

Adherence to HAART	Frequency	Percent	Cum. Percent	95% CI Lower	95% CI Upper
ADHERENT	90	88.24%	88.24%	80.35%	93.77%
NON	12	11.76%	100.00%	6.23%	19.65%
TOTAL	102	100.00%	100.00%		

Figure 4: Pie Chart on Adherence to HAART



Comparing adherence to HAART between the different genders, there is not much difference. Of the 61 female participants, 54(88.5%) were adherent to HAART. Of the 41 male participants, 36(87.8%) were adherent to HAART.

Table 7: Gender difference in adherence to HAART

Gender	Adherence to HAART		Total
	ADHERENT	NON	
FEMALE	54	7	61
MALE	36	5	41
Total	90	12	102

Comparing adherence to HAART between different educational levels revealed the following: 16(80%) of those with no formal education were adherent to HAART, 45(91.8%) of those with the highest education of between grade 1 and 7 were adherent and 29(93.5%) of those with the highest education of Grade 10 and 12 were adherent to HAART. Adherence to HAART seems to increase as level of education increases. However with a p value of 0.4886 and df of 3, this is not a significant relationship.

Table 8: Relationship between Education and Adherence to HAART

Education	ADHERENT	NON	TOTAL
GRADE10-12	29	2	31
GRADE1-7	45	6	49
NONE	16	4	20
TOTAL	90	12	102

Chi-square	df	Probability
2.4272	3	0.4886

4.4 Relationship between alcohol use and adherence to HAART

Of the 33 participants who are hazardous alcohol users, 26(78.8%) were adherent to HAART compared to 7(21.2%) who were non adherent to HAART. The picture changes among those who did not use alcohol. Of the 48 participants who did not use alcohol, 44(91.7%) were adherent to HAART and 4(8.3%) were not adherent. What is interesting to note is the fact that of those who were non hazardous alcohol users, adherence to HAART remained high. Adherence for this group was 95.2 %(20 out of 21 participants).

Table 9: Relationship between Alcohol use and Adherence to HAART

ALCOHOLUSE	ADHERENT	NON	TOTAL
ABUSE	26	7	33
ALCOHOLUSE	20	1	21
NIL	44	4	48
TOTAL	90	12	102

Chi-square	df	Probability
4.3739	2	0.1123

From the Chi-square table, the p value of 0.1123 is not significant therefore there is not enough statistical evidence to link the two variables i.e. Alcohol Use (Independent Variable) and adherence to HAART (Dependent Variable). However there is a definite difference in adherence between those who are hazardous alcohol users and those who are non hazardous alcohol users and non alcohol users in terms of their adherence to HAART.

4.5 Discussion

Some studies have found that alcohol use among PLWHA was higher than the general population. Studies done in the USA showed that PLWHA are more likely to use alcohol than the general population (Pandrea et al. 2010). Other studies showed that up to 50% of PLWHA abuse alcohol (Mariana, Carlin, Shenghan and Sabrina et al. 2009). In this study the rate of alcohol usage among the PLWHA was found to be 52.9% which is in keeping with the studies mentioned above. According to a KAP study done by SIAPAC in 2002, 50% of adult people in Namibia reported drinking alcohol (SIAPAC 2002). Another study done in 2009 in Namibia found that 46% of adults use alcohol (LeBeau. 2009). Comparing the findings of these two previous studies done, we see that there seems to be a slightly higher rate of alcohol consumption among the PLWHA as compared to the general population. A study done by Pandrea and colleagues in 2010 showed that PLWHA are more likely to use alcohol than the general population. Though there is a slight difference between rates of use of alcohol among PLWHA compared to the general population, it still remains a great concern considering the negative effects on HIV disease progression.

According to the World health survey report of 2003, 4.9% of females were heavy and hazardous drinkers as compared to 3.1% of males in Namibia. For this study, 19(31.5%) of the female participants were found to be hazardous alcohol users and compared to 14(34.2%) of the male participants. In this study, unlike the world health survey of 2003, more males were found to be hazardous alcohol users as compared to their female counterparts. What is really worrying is the higher prevalence of hazardous alcohol use among the PLWHA as compared to the general population. This study found that 31.5% of female participants were hazardous alcohol users a figure which more than six times compared to the general population which stood at 4.9% in 2003. Of the male participants 34.2% were found to be hazardous alcohol users compared to the general population figure of 3.1%. This is more than a ten times difference and is a very worrying phenomenon. Alcohol has been shown to cause dis-inhibition in people. This results in people engaging in unsafe sex like multiple concurrent sexual partnership, unprotected sex and sex with high risk partners like commercial sex workers (CSW) or intravenous drug users (IDU) (Pandrea et al. 2010). Since there is this issue of dis-inhibition, these PLWHA might be engaged in unsafe sexual practices which increase the spread of HIV.

Alcohol use has been shown to increase HIV/AIDS disease progression. Alcohol directly suppresses the immune system (Mariana et al. 2009). This is due to its effect on immune cells like t-cells, natural killer cells and macrophages. It causes a decline in the CD4 count even in the absence of HIV. With more than 50% of PLWHA on HAART using alcohol, concern will be raised on whether the HAART will have a positive effect on disease progression. By giving patients HAART we aim to halt HIV disease progression. However with patients on HAART using alcohol, this effort to halt disease progression might prove to be futile. What will be interesting to do is a follow study to look at clinical and immunological response between those patients using alcohol and those not using alcohol.

Alcohol use also has an effect on the metabolism of ARVs by the liver. Alcohol is metabolised by the liver which is the same organ responsible for metabolism of most of the ARV drugs (Pandrea et al 2010). This can result in some drug to drug interactions which might result in toxic effects of some of the medications. With this study, a significant proportion of participants were found to be hazardous alcohol users. These are more likely to have alcohol related liver damage which will have an effect on the antiretroviral medicine metabolism. This will have an effect on the ultimate patients' response to HAART.

This study found that 88.2% of the participants were adherent to HAART in the four days prior to contact of the survey while 11.8% were not adherent. This proportion of participants who were non adherent to HAART is high considering the dangers posed by poor adherence to HAART. The method used during the study was a subjective way of testing for adherence. This method has a shortcoming of not reflecting the actual picture because most participants might not be honest about their adherence to HAART. This results in adherence being high when in fact it is low. So this figure of 11.8% might be even bigger when an objective method of testing for adherence is used. When patients are not adherence to HAART, they stand a risk of the HIV virus developing resistance to the antiretroviral medicines. This will be disastrous for the programme of containing the HIV epidemic. When patients are adherent to HAART, their viral load will be suppressed. This results in them being less likely to transmit the HIV virus to their sexual partners, hence a reduction in the spread of HIV. On the contrary, if they are non adherent

to HAART, their viral load will not be adequately suppressed and hence a higher chance of HIV transmission.

In order to achieve optimal clinical outcome, PLWHA who are on HAART need to take 95% or more of their prescribed ARV medications (Magutu, Zewotir, North et al 2010). Adherence to HAART is influenced by a host of factors which can be grouped into social, behavioral, demographic and economic (Magutu et al 2010). Studies have however failed to concur on the link between demographic factors and adherence to HAART. Age for example has not been consistently shown to affect adherence to HAART (Murphy, Marelich, Hoffman and Steers. 2004). In this study the relationship between adherence and gender was not well demarcated. This study showed that 88.5% of female participants were adherent to HAART as compared to 87.8% of male participants who were adherent to HAART. Though there was no statistically significant difference in adherence to HAART for different educational level, there was an obvious difference between those with no formal education (80%) and those with Grade 10 and above (93.5%).

Of the 33 participants who are hazardous alcohol users, 26(78.8%) were adherent to HAART compared to 7(21.2%) who were non adherent to HAART. The picture changes among those who did not use alcohol. Of the 48 participants who did not use alcohol, 44(91.7%) were adherent to HAART and 4(8.3%) were non adherent to HAART. Comparing adherence to HAART between hazardous alcohol users and non alcohol users shows a significant difference. Hazardous alcohol use is associated with poor adherence to HAART. Some studies have shown that patients who use alcohol have a nine fold increase in non adherence as compared to those who do not use alcohol (Parsons, Rosoe, and Mustanski. 2008). This study showed an increase in non adherence of almost three times between non alcohol users and hazardous alcohol users. However for this study there was not much difference in adherence between non hazardous alcohol users and alcohol users in terms of adherence to HAART. What is interesting to note is that adherence to HAART was even better for non hazardous alcohol users (95.2%) compared to non alcohol users (91.7%). This difference in adherence could be due to other factors.

CHAPTER 5: CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

5.1 Conclusion and implications

This study found that PLWHA on HAART who attend Otjiwarongo hospital use alcohol more than the general population. This goes to show that alcohol abuse among PLWHA is indeed a problem which needs urgent attention. The study also showed that PLWHA on HAART at Otjiwarongo are more likely to abuse alcohol than the general population. This therefore confirms the feeling among the health care workers that PLWHA are using or abusing alcohol.

When PLWHA abuse alcohol, there are some dire consequences in terms of prognosis of the disease. These patients are more at risk of disease progression compared to those who do not use alcohol. The benefits of using antiretroviral medicines in such patients might be masked by effects of alcohol on the disease. It is therefore important to thoroughly screen all PLWHA for alcohol use using a tool like the Alcohol Use disorders Identification Test (AUDIT). This will help identify those patients who are hazardous alcohol users. These will then be referred for appropriate rehabilitative management before HAART can be started. To start a patient with a problem of alcohol abuse on HAART will not be beneficial considering all the negative effects of alcohol on HIV disease progression. What will be important will be to sort out the problem of alcohol abuse first before starting HAART. Since alcohol has been shown to be an immunosuppressant, by reducing alcohol use among PLWHA, we might actually improve the immunity of a patient even before starting HAART.

Though adherence to HAART was found to be reasonably high, a more objective method of measuring adherence could have been ideal. Though the adherence is good among all the other PLWHA on HAART, adherence was particularly low in those PLWHA who were hazardous alcohol users (Alcohol Abusers). Adherence in this group was significantly low. This goes to show that hazardous alcohol use is associated with poor adherence to HAART. This re-emphasizes the need to screen all PLWHA for alcohol abuse before HAART is started. When patients are not fully adherent to HAART, they stand a risk of developing resistance to HAART. This could spell a public health catastrophe. Drug resistant HIV is very difficult and very

expensive to treat. This has the potential of erasing the benefits gained so far in containing the HIV epidemic. Based on these findings in this study, the following is recommended:

5.2 Recommendations:

1. All PLWHA must be thoroughly screened for alcohol use before HAART is started.
2. Objective methods of identifying alcohol abuse should be introduced at all ART clinics to identify patients with a challenge of alcohol abuse.
3. All patients with a problem of alcohol abuse should be referred for appropriate management before HAART is commenced.
4. Social Workers should play a significant role at all ART sites. Their role should be to look at some of the social issues surrounding the patients including alcohol use.
5. A more objective method of measuring adherence should be introduced to monitor patients' adherence to HAART.
6. A follow up study could be done to look at clinical response to HAART between non alcohol users and alcohol users.
7. Awareness raising campaigns and education sessions to patients should be conducted in order to raise awareness on the dangers of alcohol use especially for PLWHA.

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APPENDIX:

Questionnaire

Section A: Socio-demographic

1. Age

18- 29	30-39	40-49	50+

2. Gender

Male	Female

3. Highest Education

None	Grade 1-7	Grade 10-12	Diploma/Degree

4. Marital Status

Never Married	Married	Separated	Divorced

5. Employment Status

Unemployed	Informal Employment	Formal Employment

6. Average Monthly Income

N\$0-1000	N\$1001-5000	>N\$5000

Section B: Four Day Adherence Test

NAME OF YOUR ARV MEDICATION	HOW MANY DOSES DID YOU <u>MISS</u>?			
	Yesterday	2 days ago	3 days ago	4 days ago
	----- Doses	----- Doses	----- Doses	----- Doses
	----- Doses	----- Doses	----- Doses	----- Doses
	----- Doses	----- Doses	----- Doses	----- Doses
	----- Doses	----- Doses	----- Doses	----- Doses

Section C: Alcohol Use Disorders Identification Test (AUDIT)

<p>1. How often do you have a drink containing alcohol?</p> <p>(0) Never (Skip to Questions 9-10)</p> <p>(1) Monthly or less</p> <p>(2) 2 to 4 times a month</p> <p>(3) 2 to 3 times a week</p> <p>(4) 4 or more times a week -----</p>	<p>2. How many drinks containing alcohol do you have on a typical day when you are drinking?</p> <p>(0) 1 or 2</p> <p>(1) 3 or 4</p> <p>(2) 5 or 6</p> <p>(3) 7, 8 or 9</p> <p>(4) 10 or more -----</p>
<p>3. How often do you have six or more drinks on one occasion?</p> <p>(0) Never</p> <p>(1) Less than monthly</p> <p>(2) Monthly</p> <p>(3) Weekly</p> <p>(4) Daily or almost daily</p> <p>Skip to question 9 and 10 if total score for questions 2 and 3 = 0</p> <p>-----</p>	<p>4. How often during the last year have you found that you were not able to stop drinking once you had started?</p> <p>(0) Never</p> <p>(1) Less than monthly</p> <p>(2) Monthly</p> <p>(3) Weekly</p> <p>(4) Daily or almost daily</p> <p>-----</p>
<p>5. How often during the last year have you failed to do what was normally expected from you because of drinking?</p> <p>(0) Never</p> <p>(1) Less than monthly</p> <p>(2) Monthly</p> <p>(3) Weekly</p> <p>(4) Daily or almost daily</p> <p>-----</p>	<p>6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drink?</p> <p>(0) Never</p> <p>(1) Less than monthly</p> <p>(2) Monthly</p> <p>(3) Weekly</p> <p>(4) Daily or almost daily</p> <p>-----</p>
<p>7. How often during the last year have you had a feeling of guilt or remorse after drinking?</p> <p>(0) Never</p> <p>(1) Less than monthly?</p> <p>(2) Monthly</p> <p>(3) Weekly</p> <p>(4) Daily or almost daily</p>	<p>8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?</p> <p>(0) Never</p> <p>(1) Less than monthly</p> <p>(2) Monthly</p> <p>(3) Weekly</p> <p>(4) Daily or almost daily</p> <p>-----</p>
<p>9. Have you or someone else been injured as a result of your drinking?</p> <p>(0) No</p> <p>(1) Yes, but not in the last year</p> <p>(2) Yes, during the last year</p>	<p>10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?</p> <p>(0) No</p> <p>(1) Yes, but not in the last year</p> <p>(2) Yes, in the last year</p>

Have you ever missed medication on days you were drinking?

YES----- NO-----

Total Score: -----